EPS-Sensitivity and Mergers*

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Abstract. Announcements of mergers where the target is offered stock very often discuss the impact of the deal on the acquirer's earnings per share (EPS), especially when the deal is EPS-accretive for the acquirer. In this paper, we document that the acquirer's EPS-sensitivity affects how deals are structured, the premium that is paid, and the types of deals that are done. We provide evidence that acquirer managers prefer to do EPS-accretive deals when (a) shareholder approval is required for deals (b) institutional investor horizon is shorter, and (c) managers' compensation is tied to EPS. Our results suggest that the relative popularity of deals financed in cash since early 2000 could be a consequence of acquirers' EPS-sensitivity and low value-multiple acquirers pursuing high value-multiple targets.

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"Burford Capital shares jumped 12%... Burford will pay $160 million for Gerchen Keller in a combination of cash, shares and loan notes… acquisition will be immediately accretive to earnings per share, Burford said."

Mergers are among the most important investment decisions companies engage in. As the opening quotation illustrates, stock-financed merger announcements (in which target shareholders receive a fixed number of shares in the combined company per target share, called the "exchange ratio") are frequently associated with a statement about the impact on earnings per share (henceforth EPS) of the acquiring firm.[1] EPS accretion or dilution is a frequent keyword in news of M&A deals.[2] A *Factiva* search reveals 309,505 results when the keywords "Merger" along with "EPS Accretion" and "EPS Dilution" are used. Phrases that frequently occur are: "Immediately accretive," "Slightly accretive," "No material impact on EPS," "Slightly dilutive in the first year but turn accretive in 3 years," "Minimizes dilution and builds shareholder value," or close variants of these.

As these phrases suggest, a favorable portrayal of the EPS impact is generally used by acquirer management to convince shareholders about the desirability of an acquisition. Remarkably, these estimates (which can be based on analysts' earnings forecasts for the acquirer and the target) often do not include estimates of potential deal synergy, which are more long-term and likely more uncertain in nature.[3] Based on a *Factiva* search, Bernile and Bauguess (2011) and Dutodoir, Roosenboom, and Vasconcelos (2014) report that only about 20% of all deals are accompanied by a management forecast of synergies, and only 2% actually provide an NPV number.[4] These practices speak to the fact that, absent reliable synergy estimates, the change in the EPS number is one of the few ways in which shareholders can assess the per-share impact of a deal. Moreover, when synergies accrue in the longer term and are difficult to verify, the acquirer's price may be more sensitive to the short-term EPS impact. Consequently, especially when institutional investors have shorter horizons, EPS-sensitivity is also likely to play a more important role. Finally, managerial compensation is often tied to short-term performance metrics, and in particular, to EPS. This direct incentive adds to managers' focus on the EPS impact of deals.

[1] The exchange ratio for the acquirer shareholders is typically 1, that is, the acquirer shareholders get one share in the combined company per legacy share.

[2] A deal is EPS-accretive (EPS-dilutive) for the acquirer if the EPS for the acquiring shareholders increases (decreases) per legacy share as a result of the deal.

[3] For example, in the announcement of the merger between United HealthCare Corporation (Buyer) and Oxford Health Plans Inc. (Target), the deal has been described as follows. "UnitedHealth Group anticipates the acquisition will be immediately accretive to earnings per share upon closing, adding earnings at an annual rate of 16 cents per share, excluding first year operational synergies of at least $80 million to $100 million." (Source: Capital IQ - Key Developments)

[4] The discussion of timing of certain aspects of synergy gains is also typically quite imprecise. It is possible that synergy estimates are often vague or non-existent because managers can be sued for misleading synergy disclosure and may even have to disclose the basis of their synergy estimates in court (e.g. Hewlett-Packer's merger with Compaq).

In contrast to the acquirer's concern about the EPS impact of a deal, the EPS impact on the target (which is necessarily the opposite of that on the acquirer) is seldom mentioned explicitly in merger announcements. Instead, such announcements highlight the premium received by target shareholders (which is almost always positive), evidence that for target shareholders, the premium is more relevant than the EPS in evaluating the impact of the deal on target shareholder wealth.

These observations suggest that a deal that combines a positive premium and is at the same time EPS-accretive for acquirer shareholders, is most likely to receive the approval of both groups of shareholders. In our subsequent discussion, we frequently refer to two critical values of the exchange ratio, x, offered in a stock deal. The first is the ratio of the price of the target and that of the acquirer prior to deal announcement, $\frac{P_T}{P_B}$. The second is the ratio of the projected EPS of the target to that of the acquirer, $\frac{e_T}{e_B}$. In the absence of verifiable synergies, it is easy to check that the deal is accretive for the acquirer if and only if the exchange ratio x is less than $\frac{e_T}{e_B}$, and that the deal entails a positive premium for the target if and only if x exceeds $\frac{P_T}{P_B}$.[5] Thus, if for an acquirer-target pair we have $\frac{e_T}{e_B} > \frac{P_T}{P_B}$, an exchange ratio x in the interval $(\frac{P_T}{P_B}, \frac{e_T}{e_B})$ would satisfy both "requirements" that the deal offers a positive premium to the target and is also accretive for the acquirer. On the other hand, if $\frac{P_T}{P_B} > \frac{e_T}{e_B}$, it is not possible to pay a positive premium and for the deal to be accretive for the acquirer. Since paying a premium is in most cases necessary for the deal to go through, the only way for the acquirer to avoid EPS dilution in this situation is to make an offer in cash, or a combination of cash and stock.[6]

In this paper, we build on these insights to examine whether the dual conditions of a positive premium for the target and EPS accretion for the acquirer influence merger deal making. We provide evidence that deals are more likely to be in cash (or a combination of cash and stock) when doing these in stock would entail dilution. We also show that immediately around the potential dilution threshold, there is a discontinuous increase in the number and propensity of cash and mixed deals, suggesting dilution avoidance as a major consideration for the way these deals are structured.

If a deal is wealth creating and positive NPV for the acquirer, immediate earnings accretion should be irrelevant. The extent to which deals are influenced by accretion considerations sheds light on the extent of distortion that EPS focus creates in the market for corporate control. We examine whether market reactions at deal announcement and deal synergies suggest that some accretive deals

[5] Recall that the exchange ratio is the number of shares in the combined company target shareholders receive per target share. The premium in a stock deal is defined as $(xP_B - P_T)/P_T$. For this to be positive, we require $x > P_T/P_B$. Note that except when the deal synergy is zero, this premium does not capture the NPV gain to the target.

[6] If a cash deal is financed by debt, the total net earnings would be reduced by the incremental (after-tax) interest payment. In general, as long as the borrowing cost (or the opportunity cost of forgoing excess cash) is not too high, paying cash would still mitigate dilution to the earnings per share, since it avoids issuing new equity. We discuss these issues in more detail in Section 3.

are done to avoid immediate market penalty (which might jeopardize the deal) but result in lower synergies.[7] We find consistent evidence.

Finally, we examine what considerations motivate managers to overweight EPS-accretion. We find three factors to be important. First, we find that shareholders are more likely to approve deals when they are EPS-accretive, when such approval is required. We find, in addition, that two sources of short-termism identified in the literature, namely, the importance of short-horizon institutional shareholders and CEO compensation tied to short-term performance, amplify the effect of EPS accretion on deal structure.

We now provide an overview of our main tests. We begin by noting a close time-series correlation between the fraction of deals that are done in cash and the fraction of deals for which $\frac{P_T}{P_B}>\frac{e_T}{e_B}$ (that is, the fraction of deals which, if done in stock, would have been EPS-dilutive for the acquirer if a positive premium had to be paid). Figure 1 illustrates the time trends in three types of deals (cash, stock and those that involve a combination of cash and stock – henceforth called "mixed" deals). The importance of cash deals and stock deals switch after 2001, with cash deals becoming more common.[8] Figures 2(a) shows the fraction of deals done in cash and the fraction for which $\frac{P_T}{P_B}$ exceeds $\frac{e_T}{e_B}$. The two series are highly correlated, with both trending upwards around 2001. Figures 2(b) shows precisely the opposite patterns for stock deals. These patterns suggest that especially since 2002, there is a tendency for low P/E acquirers to buy high P/E targets, and in order to avoid dilution, these deals are increasingly done with cash. We find consistent evidence when we examine whether, in the cross-section, cash (stock) deals are associated with a larger (smaller) fraction of deals for which $\frac{P_T}{P_B} > \frac{e_T}{e_B}$. We find this is the case: for cash deals, this fraction is 55%, whereas for stock deals, the corresponding fraction is 34%. Logit regressions with year fixed effects confirm that the likelihood of all cash deals increases by 5 percentage points, and the fraction of the deal value that is paid in cash increases by more that 33 percent, if $\frac{P_T}{P_B} > \frac{e_T}{e_B}$. As further evidence of the sensitivity of acquirers to EPS dilution, we find that cash deals are much more likely when, conditional on the acquirer having a positive EPS, the target has negative as opposed to positive EPS.

For more direct evidence that deals are structured to avoid EPS dilution, we conduct several counterfactual exercises. First, we calculate a "pseudo EPS impact" (henceforth *P_CH_EPS*) measure for all cash and mixed deals. This measure indicates what the change in EPS would have been if these

[7] Synergy is calculated as the combined cumulative abnormal returns of acquirer and target from 42 trading days prior to announcement to deal completion.

[8] de Bodt, Cousin, and Roll (2017) argue that the 2001-abolishment of pooling accounting in takeovers contributed to lowering (earnings-based) managerial incentives to make stock payments. Eckbo, Makaew, and Thorburn (2018) suggest that potential competition for the target from cash-paying private bidders may have driven the increasing popularity of cash deals.

deals had been done entirely in stock, assuming the total consideration in terms of the value of the acquirer's stock (either immediately prior to the announcement or immediately after) would be the same. Figure 3 shows that there is a sharp discontinuity at 0: the number of deals done in cash are discontinuously higher for slightly negative values of *P_CH_EPS* as opposed to slightly positive values. We get very similar results for mixed deals, as evidenced in Figure 4. These results speak to the sensitivity of acquires to dilution: cash deals are preferred to avoid even minor dilution in stock deals. However, by affecting the structure of the deal, EPS considerations affect the capital structure of the resulting firm, potentially pushing it off its optimum in a way that takes years to correct (see evidence in Harford, Klasa, and Walcott (2009)).

We directly examine whether deal terms and thus the sharing of the deal synergy between acquirer and target shareholders is affected by concerns about EPS dilution. For deals with $\frac{P_T}{P_B} < \frac{e_T}{e_B}$, a smooth distribution of bargaining power between acquirer and target would suggest that, for pure stock deals, the exchange ratio x would also be smoothly distributed. In contrast, what we observe in the data is that there is a discontinuity at $\frac{e_T}{e_B}$ – there is a clustering of deals just to the left of $\frac{e_T}{e_B}$ (which renders these deals accretive) relative to just to the right (where they are dilutive). Accretive pure stock deals that just avoid EPS dilution suggest that many deals are structured specifically for that purpose. However, if the exchange ratio is being manipulated down to make the deal accretive, this also means that the target gets a lower premium. In principle, such "lost" premia could be made up by adding cash to the deal – indeed, as discussed earlier, our results from Figures 4 and 5 suggest that many cash and mixed deals are done to avoid dilution. Thus, the question arises as to why so many slightly accretive pure stock deals are observed. One possibility is that target management is especially eager to do these deals – perhaps because of Golden Parachute payments or other target management incentives discussed in the literature (Shleifer and Vishny (2003), Cai and Vijh (2007), Hartzell, Ofek, and Yermack (2004)). This is exactly what we find – using hand collected data on Golden Parachutes, we find that mixed deals are less likely than comparable pure stock deals when target management Golden Parachutes are higher. Moreover, we find that, consistent with our expectation, slightly accretive stock deals are associated with lower target premium compared with slightly accretive mixed deals.

These results establish EPS-sensitivity as a major consideration in M&A deal-making. It may be noted that the dual conditions of positive premium and accretion both hold only when $\frac{P_T}{P_B} < \frac{e_T}{e_B}$, or $\frac{P_T}{e_T} < \frac{P_B}{e_B}$, that is, when "high buys low". High buying low was a major phenomenon in the 1990s, the earlier part of our sample period, when stock deals dominated other deal types (Figure 1). The "story" of mergers during this period was one of overvalued acquirers buying less overvalued targets using stock as a currency (Shleifer and Vishny (2003), Rhodes-Kropf, Robinson, and Viswanathan (2005), Dong eat al. (2006), Ang and Chen (2006)). The question may therefore arise as to whether our results that

stock deals are overwhelmingly accretive – especially when the "high buys low" condition is met – are simply a reflection of this story.[9] The answer is "no". All the results discussed above come primarily from the later period of our sample, that is, from 2002-2017. The results are often insignificant when we restrict attention to the earlier period (1991-2001).

If the EPS impact of a deal receives too much weight in managerial decision making, there is concern whether the right types of deals get done. We find that even though slightly accretive deals are associated with higher announcement acquirer returns than slightly dilutive deals, over the period starting 42 trading days before deal announcement to deal completion, the cumulative abnormal returns of target and acquirer (a measure of "deal synergy") are lower. This suggests that deal structure is manipulated to make some deals go through even when they are not the best deals possible.

Finally, we examine what drives sensitivity of acquirer managers to EPS dilution in stock merger deals. First, we examine whether obtaining shareholder approval is a reason why acquirer managers are concerned about the EPS impact. Shareholder approval is required if a deal involves share issuance in excess of 20% of outstanding shares (Li, Liu and Wu (2018)). Given this, we hypothesize that acquirers will be reluctant to register and issue more than 20% when the deal is dilutive, preferring cash or mixed deals. Consistently, in the spirit of Li, Liu and Wu (2018), we find that among all deals, the percentage of cash in deal consideration increases discontinuously as the anticipated share issuance associated with a counterfactual stock deal crosses the 20% threshold, and that this effect is only present for deals that would be dilutive if done entirely in stock. We also observe that deal completion rates are higher for accretive deals, and there is a discontinuous increase in the completion rate when the deal becomes slightly accretive, and this effect is only present for deals that involve more than 20% stock issuance. "Deeply dilutive" deals are twice as likely to be withdrawn as other types of deals. These results strongly suggest that shareholder approval of deals is an important reason why EPS accretion matters for acquirers.

Second, we examine whether EPS-sensitivity is associated with ownership structure. Management estimates of deal synergies could be discounted by the market unless they are validated by analysts, which takes time after the announcement. Thus, at announcement market participants may focus on the immediate impact on earnings per share, causing the stock price reaction to be sensitive to EPS effects. Institutional investors who are sensitive to the "short-term price" will therefore prefer deals that are accretive. Thus, we hypothesize that when the firm's institutional investors trade more

[9] Close to 70% of the stock deals in our sample correspond to P_T/P_B <e_T/e_B , and of these, 75% turn out to be accretive for the buyer.

frequently, if the deal is in stock, it is more likely to be accretive, and more likely to be accretive by a small margin than be dilutive by a small margin.[10]

Finally, we examine whether deals are more likely to be accretive when the CEO's compensation is linked to EPS targets. Specifically, we expect that when the CEO has a larger proportion of compensation tied to unvested incentive plans and EPS is a vesting hurdle, deals are more likely to be done in cash, and more likely to be accretive when stock payments are involved. We find consistent evidence.

Our paper is one of the first to explore the importance of EPS management in the context of M&As. To our knowledge, the only other paper that has paid attention to EPS accretion or dilution in the context of M&As is Garvey, Milbourn, and Xie (2013). These authors build on Shleifer and Vishny (2003) to construct EPS accretion-motivated measures of the likelihood of a firm being an acquirer or a takeover target. The idea is that if the market participants believe that the acquirer is a high value firm because of (real or imagined) synergies which will translate to a corresponding multiple of the target assets or earnings following a merger, then accretive deals are more likely to be viable (in the sense that the acquisition is more likely to be profitable after paying the required premium).[11] The authors define two firms in the same industry as viable candidates to merge if the high-P/E firm can increase its EPS after paying a 20% premium to the low-P/E firm. They show that the likelihood of a firm being an acquirer (target) is strongly related to the number of viable targets (acquirers) in the same industry. The key difference between our contribution and that of Garvey, Milbourn, and Xie (2013) is that while they suggest that acquirers are chasing EPS-accretive deals because they can make valuation gains, we show that acquirers structure deals to avoid EPS dilution, and that one way they do this via cash or mixed deals. We show that excess focus on EPS accretion, driven by internal and external short-termism incentives, alters what deals are done, how they are structured and the division of the gains through the premium.

The rest of the paper is organized as follows. Section 2 reviews the related literature, and Section 3 develops our hypotheses. Section 4 discusses the data and sample characteristics. Section 5 presents our results, and Section 6 concludes the paper.

[10] One might wonder why there should at all be any slightly dilutive deals, since (i) a small amount of cash might render the deal accretive, and (ii) as noted above, slightly dilutive deal announcements are associated with lower stock price reaction. As regards the first issue, it is possible that the target management is reluctant to add a small amount of cash as it might trigger tax obligations for shareholders and distribution costs. As regards the second, in results not reported in tabular form, we find that when slightly dilutive deals are done in spite of high ownership by short horizon institutional investors, deal synergies as reflected in combined cumulative returns of target and acquirer is higher. This suggests that these are possibly deals where synergy is more visible, and EPS accretion may not be as necessary to convince shareholders.

[11] Thus, this is a version of the "bootstrap game" described in Finance textbooks. Some have argued that this type of bootstrap game contributed to the merger wave of the 1960s (see, for example, Patrick A. Gaughan, "Mergers, Acquisitions, and Corporate Restructurings", sixth edition, pp 594-595.)

2. Previous Literature

2.1 Mergers and Relative Valuation

Our paper is related to the large literature on the relative valuation multiples between acquirers and targets. Lang, Stulz, and Walkling (1989) and Servaes (1991) show that total returns of a merger deal are high when the target has a low Q ratio and the acquirer has a high Q ratio. Jovanovic and Rousseau (2002) propose the "Q-theory explanation" which predicts that mergers facilitate the reallocation of underperforming capital from the low-Q targets to the high-Q acquirers. On the other hand, Shleifer and Vishny (2003) propose a theory based on mispricing which predicts that using overvalued stocks as currency to purchase less overvalued target assets can benefit the acquirers in the long run. The target management is willing to accept such deals due to the agency issues or short-termism. Rhodes-Kropf and Viswanathan (2004) further show that when stock misvaluations have a firm-specific component and a market-wide component, even rational targets will accept a bid from over-valued acquirers, because they tend to overestimate the deal synergies owing to the common market-wide misvaluation. The mispricing theories have empirical support. Dong et al. (2006) find evidence supporting both the Q theory and mispricing. They show that the Q theory is stronger in the pre-1990s period, while the evidence for misvaluation is stronger in the 1990-2000 period. Rhodes-Kropf, Robinson, and Viswanathan (2005) decompose stock mispricing into three components and find acquirers tend to have a higher firm-specific misvaluation but a lower long-run valuation than the target, which is more consistent with the mispricing explanation. Ang and Cheng (2006) document that over-valued firms are more likely to make acquisitions with stocks and gain from acquiring targets that are less over-valued. Garvey, Milbourn, and Xie (2013) show evidence for the "EPS bootstrap game", which is based on the market's belief that an acquirer's value multiple would transmit to the combined company after the merger. Under such belief, the acquirers would benefit from EPS-accretive deals. They show that a firm is more likely to be a target when there are more firms in the industry that could achieve EPS-accretion after paying a substantial premium. In our sample as well, it is more common to observe a higher value-multiple firm acquiring a lower multiple firm in the stock-financed mergers. Our contribution lies in providing evidence that acquirer are averse to EPS dilution and showing that whether merger deals are paid for in stock or cash (or a combination) can be understood in terms of the dilution aversion of acquirers.

2.2 Short-termism and Corporate Policies

Our paper contributes to the literature on managerial myopia and short-termism. The early theoretical work of Stein (1988, 1989) and Miller and Rock (1985) predict that stock price concerns can lead managers to overweight short-term cash flows and make distortionary long-term decisions. These arguments suggest that earnings per share, as a major metric of short-term cash flows and performance, is likely to play a critical role in shaping companies' financing and investment decisions. Several papers

document the adverse effects of short-termism on corporate policies, including Bushee (1998), Derrien, Kecskes, and Thesmar (2013), Asker, Farre-Mensa, and Ljungqvist (2014), Gutierrez and Phillipon (2016). The survey paper Almeida (2018) provides a detailed overview of this literature.

Even though acquisitions are among the most important investment decisions for companies, there are very few papers focusing on the impact of short-term concerns on mergers. Gaspar, Massa, and Matos (2005) first document evidence that the short investment horizons of shareholders place the firm at a weak bargaining position in merger negotiations. Chen, Harford, and Li (2007) show that the post-merger performance is better when the bidder has concentrated independent long-term institutional ownership, which suggests that such investors are efficient in monitoring.

The literature discussed above has identified the short-term goals of certain types of investors as one source of myopia. Many papers have also examined other sources of short-termism, such as executive compensation and treating EPS as the performance targets. Cheng, Harford, and Zhang (2015) find that when a CEO's bonus is directly linked to EPS, the firm is more likely to conduct a buyback which does not generate long-term returns. In the same vein, Almeida, Fos, and Kronlund (2016) document that managers repurchase stocks in order to meet analysts' EPS forecasts. Bennett et al. (2017) show that the earnings performance goals specified in the executive incentive plans also generate motivations for the managers to manipulate earnings around these goals.

2.3 Shareholder Voting in M&As

Finally, our paper also contributes to the literature on whether and how shareholder voting matters in M&As. The literature has established that acquirer's shareholder approval serves as an important governance mechanism to prevent self-serving or overconfident managers from making value-destroying deals (e.g. Becht, Polo, and Rossi (2016)). Moreover, since voting is only mandatory in the US when the acquirer issues more than 20% new shares, managers can bypass voting by paying the target with cash instead of stock. Li, Liu, and Wu (2018) show that there is a large cluster of mixed deals that issue shares just below 20% compared with just above it. Hsieh and Wang (2008) also find some evidence that acquirer managers structure deals to bypass shareholder approval. Our findings are consistent with the literature by showing that the proportion of cash in deal consideration jumps up for deals that would have crossed the 20% threshold had they been done entirely in stock. Moreover, we find the results are concentrated in the subsample of deals that would incur EPS dilution if they were fully paid in stock. Our paper adds to this literature by establishing EPS-sensitivity as one of the concerns that may drive shareholder voting outcomes and in turn affect management's incentive to bypass the vote.

3. Hypothesis Development

Our key hypothesis is that in a stock merger, the managers of the acquiring firm are sensitive to whether the merger results in a dilution of EPS, that is, a lower EPS for the combined firm (based on the latest earnings forecasts of both firms). Because synergies are long-term and unverifiable, market participants, especially those with short horizons, will focus on the immediate impact on EPS ignoring any potential synergy (the term "immediately accretive" is commonly used to describe the EPS impact of a deal). Target shareholders will judge the deal by the premium they receive. We are not arguing that EPS accretion is the primary driver of mergers. Rather, the immediate implication of EPS-sensitivity could manifest in the way the deal consideration is structured. Nonetheless, to the extent that payments in cash could be costly for certain types of acquirers and target shareholders, EPS-sensitivity could well affect the types of deals that are done.

To simplify notation, we will define $x_1 = \frac{P_T}{P_B}$ and $x_2 = \frac{e_T}{e_B}$. Specifically, in our study, the prices are those that prevail one day prior to deal announcement, and the earnings per share are the latest available analyst forecasts prior to deal announcement. If the market is focused on immediate EPS accretion, then (ignoring synergies and other accounting adjustments such as amortization of goodwill), a stock merger with $x > x_2$ is dilutive to the EPS of acquirer shareholders. EPS dilution can be largely mitigated or even avoided if the deal is done in cash. To see this, suppose a merger is done in two steps. In the first step, the target is combined with the acquirer through the offer of acquirer stock. The deal would be dilutive for the acquirer if the combined EPS is lower than the acquirer's pre-merger EPS. In the second step, the acquirer chooses to repurchase a fraction of the shares issued to target shareholders. If none (part/ all) of the new shares are repurchased, the deal ends up effectively as a pure stock (mixed/ cash) deal. As long as the ratio between the combined EPS and the repurchase price is higher than acquirer's after-tax borrowing cost (or the opportunity cost of not holding cash),[12] the resulting EPS would be higher than the initial combined EPS. In other words, paying cash can alleviate EPS dilution, as long as the acquirer's borrowing cost is not too high. Cash deals may be less desirable than stock deals for the target because taxes are likely to be higher and immediately payable. However, given that the target almost always has to be paid a premium, if $x_1 > x_2$, doing the deal in stock entails dilution. In such cases, cash or mixed deals are more likely.

We construct a counterfactual or "pseudo" exchange ratio, x_{ps}, for cash and mixed deals. This is defined as the offer price per target share divided by the acquirer's stock price one day prior to deal announcement. We also construct a pseudo change in EPS (*P_CH_EPS*) based on this pseudo exchange ratio, which is what the change in EPS would be if the deal were done in stock with $x=x_{ps}$.

[12] The condition applies to any stock repurchase. The post-repurchase EPS$= \frac{eps \cdot n - (1-\tau)E(R) \cdot k \cdot p}{n-k}$, where eps is the pre-repurchase EPS, n is the pre-repurchase number of shares, k is the number of shares repurchased, and p is the repurchase price. The post-repurchase EPS is higher than before if $\frac{eps}{p} > (1-\tau)E(R)$.

We have the following hypothesis:

Hypothesis 1. (i) In the time series, the fraction of deals that are done in cash each year has a positive correlation with the fraction of deals for which $x_1 > x_2$. (ii) Dilution pressure (as measured by an indicator variable $D(x_1 > x_2)$) is positively related to the likelihood of a cash deal and the fraction of the deal value that is paid in cash. (iii) Both the propensity of a cash deal (relative to stock and mixed deals) and the fraction of the consideration that is paid in cash are higher if the deal would have been dilutive if done in stock (*P_CH_EPS*<0).

If one motivation for cash and mixed deals is to avoid or mitigate EPS dilution associated with stock deals, then we should expect discontinuous changes in the type of deal financing around EPS dilution thresholds. We have the following two hypotheses:

Hypothesis 2. Consider the frequency distribution of cash (alternatively, mixed) deals over the range of values of the pseudo change in EPS (*P_CH_EPS*) that would be realized if the deals were done in stock instead. We expect that: (i) The frequency of both cash and mixed deals increases discontinuously as the pseudo change in EPS (*P_CH_EPS*) goes from slightly positive values to slightly negative values. (ii) The fraction of cash (and mixed) deals satisfying the accretion condition (ratio of combined EPS over price exceeding acquirer's after-tax borrowing cost) is significantly higher if *P_CH_EPS* is slightly negative rather than slightly positive.

The second part of the hypothesis follows because the discontinuity implies that the cash deals that replace slightly dilutive stock deals (corresponding to slightly negative *P_CH_EPS*) are accretive to the acquirer shareholders.

Instead of trying to infer EPS-sensitivity of acquirers from the counterfactuals of stock deals that are *not* done, one can examine stock deals directly. If EPS dilution is costly for the acquirer, then slightly dilutive deals should be replaced by either slightly accretive pure stock deals or by slightly accretive mixed deals involving a combination of stock and cash. From the target shareholders' point of view, the latter type of deal would seem to dominate the former, since some premium is sacrificed if a dilutive stock deal is replaced by an accretive pure stock deal without cash. Adding cash, however, triggers a taxable event for target shareholders. The compliance costs (computing proportional bases for each share owned, computing and paying the tax owed, etc.) are relatively high and fixed, so target shareholders would balk at accepting a deal with just a small amount of cash in the consideration versus a deal that is all equity.[13] Second, the accretion condition for cash deals might not hold for slightly pseudo-dilutive deals, so that doing the deal in cash may not help mitigate dilution. Finally, target manager incentives could also play a role in slightly accretive deals being done without any cash

[13] Adding cash also complicates deal structure and in particular, increases the work load of credit rating analysts. Given firms' concern about a merger's impact on their credit rating, they are usually reluctant to complicate deal structure with just a small amount of cash. We thank Marc Zenner (discussant) for pointing this out.

component. Target management incentives have been studied by several authors. Shleifer and Vishny (2003) argue that target managers are willing to accept overvalued acquirer stock in pure stock deals as they want to cash out of their unvested stock and option holdings when market valuations are high, and Cai and Vijh (2004) find consistent evidence. Hartzell, Ofek, and Yermack (2004) find that acquisition premia are lower when target CEOs receive excess cash compensation in the form of Golden Parachutes or bonuses. Thus, if we focus on pure stock deals that *can* be accretive, we should expect the following:

Hypothesis 3. For deals with $x_1 < x_2$, there is a discontinuous increase in the frequency of pure stock deals as the (realized) change in EPS crosses the threshold of 0 from the left.

Hypothesis 4. (i) A slightly accretive stock deal is associated with lower acquisition premium than a slightly dilutive stock deal, as well as a slightly accretive mixed deal. (ii) Controlling for the implied level of dilution if the deal were done as an all-stock deal, a mixed deal is less likely than a comparable all-stock deal if the target CEO's Golden Parachute payments are higher.

The idea behind Hypothesis 4(ii) is that adding cash to a deal could have adverse implications for deal completion under some circumstances. For example, the condition required for cash payments instead of stock of the same value to have a favorable impact on the acquirer's EPS might not be satisfied. In such a case, doing the deal in stock and sacrificing a part of the premium (instead of paying the latter in the form of cash) may be the only way to make the deal accretive.[14] In such instances, instead of waiting for another potential acquirer to emerge, with whom an accretive deal could be done without a corresponding loss of premium for the target (e.g., an acquirer with a higher valuation multiple), target management might prefer to do the deal sooner even if this means a lower premium for target shareholders. A large amount of Golden Parachute payments might distort target management incentives in this manner.

Next, we come to the issue of whether EPS-sensitivity can affect the *type* of deals that get done. If acquirer managers are overweighting the EPS impact in their deal decision making, and the market is overweighting it in the short-run reaction, we would expect that marginal deals with negative EPS impact will not be done, while marginal deals with positive EPS impact will. EPS-dilutive deals can only be done with large synergies that can be conveyed credibly to the market by the time the deal is completed. Thus, we hypothesize that:

Hypothesis 5. For pure stock deals with $x_1 < x_2$, as the EPS change goes from slightly negative (slightly dilutive pure stock deals) to slightly positive (slightly accretive pure stock deals), (i) the abnormal announcement returns for the acquirer will increase discontinuously, and (ii) deal synergy (as measured

[14] Although we do not state this possibility as a separate hypothesis, we find support for this conjecture and report this later.

by the combined cumulative abnormal return of acquirer and target from 42 trading days before deal announcement to deal completion), will decrease discontinuously.[15]

Note that this hypothesis rests on the assumption that the market does not draw the inference that deal synergies are more uncertain when the deal is slightly accretive but instead focuses on the immediate EPS impact, and conversely when the deal is slightly dilutive.

Lastly, we consider possible reasons why acquirers are concerned about the EPS impact of deals. In all the major U.S. exchanges during our sample period, an acquirer issuing more than 20% of outstanding shares in a stock deal has to obtain shareholder approval. However, if the deal is dilutive, and adding some cash would reduce the amount of issuance, acquirers would prefer to do so. Therefore, we would expect that the percentage of cash used in the deal consideration would increase discontinuously as counterfactual "pseudo issuance" associated with a deal crosses the 20% threshold from the left. Moreover, this effect should be only observed for deals that are pseudo dilutive. Finally, as further evidence that shareholder approval (with or without the formal voting mechanism) is related to the EPS impact of a deal, we expect deal completion rates for pure stock deals to be higher when the deal is EPS-accretive, and to increase discontinuously when the EPS change crosses 0 from negative to positive values, but only if the deal involves share issuance in excess of 20%. This leads to the following:

Hypothesis 6. (i) The percentage of cash payments in the total deal consideration among all deals increases discontinuously as the pseudo share issuance crosses the 20% threshold from the left, and this effect only exists for the sub-sample of deals with *P_CH_EPS<0.* (ii) Accretive deals are more likely to be completed than dilutive deals. (iii) The likelihood of deal completion increases discontinuously as the change in EPS (*CH_EPS*) goes from negative to positive, but only when the share issuance is above the 20% threshold.

We next address the issue of whether investor preferences related to the horizon of their holdings reflect EPS-sensitivity. Drawing on existing literature on short-termism, we argue that acquirers are more likely to be dilution-sensitive if a higher fraction of the firm is owned by institutional investors who trade more frequently. This leads to the following:

Hypothesis 7. (i) For deals with $x_1 < x_2$, the likelihood of an accretive stock deal, and (ii) the likelihood of a slightly accretive deal vs. a slightly dilutive deal, are increasing in the fraction of the firm that is owned by short-term institutional investors.

[15] Note that even though deal synergies might be difficult to estimate at deal announcement, the market will have more information by the time the deal is completed, and this will be reflected in the market prices of both acquirer and target.

The literature on short-termism also argues that corporate policies are distorted because CEO compensation contracts often include EPS as a performance metric. As we explain in Section 5.4.3, linking detailed information on CEO compensation contracts with our M&A sample leads to serious data loss. As a consequence, we are not able to test whether short-termism induces by CEO compensation contacts results in exactly the same effects as envisioned in Hypothesis 7. However, the following can be tested:

Hypothesis 8. (a) The likelihood of the acquisition being paid with cash instead of stock, and (b) the likelihood that the acquisition is accretive instead of dilutive when the deal is financed with stock, are increasing in the value of the acquirer CEO's compensation (relative to salary) from unvested incentive plans with EPS as one of the vesting hurdles.

4. Data and Measures

4.1 Sample

We obtain the merger events from SDC and impose the following restrictions on our sample: (1) Both the target and acquirer are US public firms; (2) Deal size is at least 1 million US dollars; (3) The acquirer owns less than 50% of the target before the deal and 100% after the deal; (4) The form of the transaction is "Merger", "Acquisition of Majority Interests" or "Acquisition of Assets";[16] (5) The deal announcement occurs between 1991 and 2017;[17] (6) Deal transaction value accounts for at least 1% and no more than 150% of the acquirer's capitalization; (7) Both the acquirer and target can be matched with a single "Permno" in CRSP;[18] (8) The deal is paid with common stock, cash, or a mixture of them;[19] (9) The deal status is either "Completed" or "Withdrawn". There are 3242 mergers in our sample, 2796 of which are completed. We focus on the sample of completed deals, except for section 5.4.1 (Table 9 and 10) where we include the withdrawn deals as well. We classify the deals in our sample into three types, the pure stock, pure cash, and mixed deals, based on the method used to pay the target firm's common shareholders.[20] The SDC M&A data are further matched with the I/B/E/S data for the annual

[16] We keep the deals in from of A, AP, AA, AC, AM, AR, and M, and exclude buyout and repurchase deals.
[17] We exclude the deals announced before 1991, because the information on deal consideration is not complete.
[18] We exclude deals in which either the acquirer or target have dual-class shares, since the "earnings per share" does not have a clear definition in these cases.
[19] We exclude the deals involving non-cash and non-stock consideration ("other consideration" hereafter). "Other consideration" include convertible bond, preferred stock, and profit sharing unit, choice between different types of considerations, and assumption of liability (which is the most prevalent form of "other consideration"). Since the deals with assumption of liability usually involve wealth transfer from acquirer's shareholders to the target's debt holders, the "offer price per share" paid to target shareholders may not be comparable to a deal without assumption of debt. Thus, we exclude the deals involving any "other consideration" to make sure our sample of deals have comparable "offer price per share", which is important for our main test of pseudo dilution.
[20] We rely on both the SDC variable of "consideration structure" and manual examination to classify deal types. The SDC "consideration structure" does not always reflect the payment method to the holders of target firms' common shares. For instance, if the common shareholders receive stock and preferred stock holders receive cash, the deal may be classified as "mixed deal" according to SDC "consideration structure." We reclassify such deal as pure stock deal.

forecasts of EPS, with CRSP for stock prices and returns, with Compustat for financial data, and with Thomson Reuters 13F for the ownership structure data.

4.2 Exchange Ratios

When merger consideration is all-stock, the shareholders of the target firm receive the number of shares of the combined company which equals to the number of shares held in the target firm multiplied by the deal's exchange ratio, x. The shareholders of the acquiring firm usually receive the same amount of shares of the combined company as the number of shares held in the acquiring firm before the merger. Thus the exchange ratio determines the ownership split between the target and acquirer shareholders. In practice, deal premium is defined as $\frac{x*P_B}{P_T} - 1$, where P_B and P_T are the stock prices of the acquirer and target before the deal announcement. A deal paying a positive premium must have $x > \frac{P_T}{P_B}$. We define $x_1 = \frac{P_T}{P_B}$ as the lower bound of the exchange ratio for deals offering non-negative premiums.

The exchange ratio also has implications for the earnings per share for both the acquirer and target shareholders. Suppose the current EPS for the acquirer and target are e_B and e_T, and the numbers of shares outstanding before the deal are n and m. Assume the merger does not change the earnings from the current assets of the acquirer and target firm in the short term. The EPS of the combined company in the current year is $e_{combine} = \frac{e_B*m+e_T*n}{m+n*x}$. The deal is called "accretive" to the acquirer if $e_{combine} > e_B$, which is equivalent to $x < \frac{e_T}{e_B}$. We define $x_2 = \frac{e_T}{e_B}$ as the upper bound of exchange ratio for an (immediate) accretive deal from the acquirer's perspective. Notice that x_2 should not be a binding constraint if the market is efficient in recognizing the deal synergy and the acquirer's management has a long-term focus. If a merger creates positive synergy, a deal with $x > x_2$ can turn accretive for the acquirer shareholders after the enhanced earnings are realized. However, as we argue above, a merger's synergy is usually uncertain at the time of deal announcement, and the short-term stock price and earnings per share can be important concerns for the management. Thus x_2 can create a ceiling for the exchange ratios of a merger deal when stock is used as payment.

The relative position of x_1 and x_2 determines the EPS dilution pressure for the acquirer, conditional on paying a positive premium to the target in stock mergers. When $x_1 < x_2$, it is possible to pay a positive premium and remain accretive for the acquirer by choosing $x \in (x_1, x_2)$. When $x_1 > x_2$, paying a positive premium would imply $x > x_2$ and the deal has to be dilutive for the acquirer. Notice that the relative position of x_1 and x_2 maps to the relative P/E levels of the target and acquirer. $x_1 < x_2$ is equivalent to a high P/E acquirer buying a low P/E target, and vice versa.

4.3 Empirical Measures

To measure x in a stock or a mixed deal, we use the variable of "Exchange Ratio" in SDC, which shows the number of new shares per legacy target share quoted from deal consideration.[21] This number determines the payoffs of the target firm common stock holders and has implications for EPS.[22]

For cash and mixed deals, we construct a "pseudo exchange ratio" (x_{ps} hereafter), which reflects the number of new shares issued per legacy target share if the deal were fully paid with stock. The pseudo exchange ratio is measured as the "offer price per share" divided by the acquirer's stock price one day before the deal announcement.[23] For stock deals, the "pseudo exchange ratio" is the same as actual exchange ratio.

We construct the measure of x_1 using the stock price of target and acquirer one day before deal announcement. Our results are robust to using the stock prices four weeks before the deal announcement.

To construct the measure of x_2, we obtain the most recent annual EPS forecasts (the median values) before deal announcement from I/B/E/S. When it is missing, we use the "last twelve month EPS" from SDC to enlarge the sample coverage. When either the target's EPS (e_T) or acquirer's EPS (e_B) is negative, x_2 is set as missing since it is not well defined. Our results are robust to constructing x_2 using only the forecasted EPS or only the last twelve months' EPS.

We measure the pseudo change in EPS (*P_CH_EPS*) using the pseudo exchange ratio (x_{ps}), the current-year EPS forecast of target (e_T) and acquirer (e_B), and the number of shares outstanding of target (n) and acquirer (m) before the deal. We define the combined EPS as $e_{combine} = \frac{e_B * m + e_T * n}{m + n * x_{ps}}$, and the pseudo change in EPS is defined as $P\_CH\_EPS = e_{combine} - e_B$.

The combined EPS is also used to assess whether paying cash is more accretive after considering the incremental interest expense. We use two proxies for the "repurchase price" of the shares (hypothetically) issued to target shareholders: the acquirer stock price one day before and one day after deal announcement. Then $e_{combine}/P_B$ is compared with the acquirer's after-tax interest rate or opportunity cost of forgoing cash, $(1-\tau) \cdot E(R)$. Following Hribar, Jenkins, and Johnson (2006)

[21] When "exchange ratio" is missing, we hand fill it from the SDC variable indicating the detailed deal consideration. We leave the exchange ratio as missing, if the deal consideration only quotes the dollar value per target share.

[22] For a few deals with collars, the exchange ratio is not fixed at the announcement. The EPS implication is then determined by the number of shares issued eventually. For robustness, we construct a measure of "Adjusted Exchange Ratio", which is the number of shares issued scaled by the target's number of shares outstanding before the deal. We report the results using the "Exchange Ratio". Our results are robust to using the "Adjusted Exchange Ratio".

[23] "Offer price per share" reflects the per share value that target's common shareholders receive. Using acquirer's stock price one day before announcement is consistent with the industry practice in determining the exchange ratios in stock deals. As a robustness check, we also use the acquirer's stock price one day after the deal announcement. Our results are robust to such choices.

and Almeida, Fos, and Kronlund (2016), we measure $E(R)$ using the 3-month Treasury-bill rate at deal announcement to estimate the forgone percentage return when the firm has excess cash.[24] If the acquirer's excess cash holding does not cover the whole deal value, we assume the uncovered component is financed with debt at the implied interest rate.[25] We use the statutory tax rate for our sample period (τ =0.34).

4.4 Sample Overview

As shown in Panel A of Table 1, there are 2050 out of the 2796 completed deals with positive EPS of both the target and acquirer. Stock deals account for 56% and cash deals account for 31% of these 2796 deals. In the subsample of deals in which the acquirer has positive EPS and the target has negative EPS, the fraction of cash deals is close to 43%, significantly higher than the average of the full sample. This is consistent with the prediction that, to avoid EPS dilution, an acquirer with positive EPS is more likely to use cash rather than stock to buy a target with negative EPS.

In Panel B of Table 1, we find that the majority (56%) of the completed cash deals have $x_1 > x_2$, while the majority (66%) of stock deals have $x_1 \leq x_2$. This is again consistent with the hypothesis that cash is paid to mitigate EPS dilution when the dilution pressure is high for the acquirer ($x_1 > x_2$). Moreover, the proportion of cash deals is much higher among deals with $x_1 > x_2$ than among deals with $x_1 \leq x_2$, and the proportion of stock deals is much lower among deals with $x_1 > x_2$ than among deals with $x_1 \leq x_2$.

5. Empirical Results

5.1 Paying Cash and Dilution Avoidance

As shown in Figure 1, there is an upward (downward) trend in the proportion of cash (stock) deals over the recent two decades. Many recent papers such as Eckbo, Makaew, and Thorburn (2017) have found a similar pattern. In Figure 2(a), we find that the proportion of cash deals is highly correlated with the fraction of deals with $x_1 > x_2$. The correlation of the two time series is as high as 0.82. Similarly, Figures 2(b) exhibit the corresponding time trends for stock deals and deals with $x_1 \leq x_2$. The correlation of two time series in Figure 2(b) is 0.88. The high correlations suggest that, consistent with Hypothesis 1(i), the method of payment has been chosen so that EPS dilution can be avoided for the acquirer after paying a positive premium to the target.

[24] The excess cash holding is defined as the residual term of OLS regression of cash holding on firm characteristics controlling for the industry and year fixed effects following the specification in Pinkowitz et al. (2016).
[25] Implied interest rate is estimated using the acquirer's total interest expenses scaled by the lagged total debt. When this variable is missing, it is filled up by the median level of the firms in the same (Fama-French 49) industry and size quintile.

It is possible, however, that the correlations observed in Figures 2 are spurious. For example, the following independent time trends could be causing the correlations: over time and especially since 2002, the type of deals that are being done is changing, with "high buys low" being gradually replaced by "low buys high", and at the same time, cash is becoming more popular as a means of payment, e.g., due to lower borrowing costs. Thus, to address this issue, we test Hypothesis 1(ii), which exploits the cross-sectional association between the acquirer's dilution pressure (ensuring positive premium) and the propensity of paying cash. We run Logistic regressions with year fixed effects to explain cash deals using the indicator for $x_1 > x_2$ which represents dilution pressure. In Table 2, we find that, after controlling for the acquirer's characteristics, including its capital structure, deal characteristics such as deal size relative to acquirer market capitalization, and year dummies, an indicator for $x_1 > x_2$ has a significant positive effect on the propensity to pay cash (compared to some or all stock). In the right panel of Table 2, we estimate Tobit regressions of the fraction of cash in deal payments on the same set of explanatory variables. We find when EPS dilution pressure is higher, the percentage of cash in deal consideration is significantly higher. The coefficients remain significant after we further control for the (Fama-French 49) industry dummies of the acquirer and target.

In Table 3, we present results corresponding to Hypothesis 1(iii). The coefficient of the pseudo-dilution dummy has a significant and positive effect on the probability that the deal is done in cash, as well as the proportion of cash used in the consideration, consistent with our hypothesis.

Next, we present evidence of a discontinuity at the dilution threshold in the number as well as the likelihood of cash deals, which provide strong evidence that cash is used to mitigate dilution. Figure 3(a) shows the density estimates of *P_CH_EPS* from both sides of zero in the sample of completed cash deals. The density discontinuity test following Cattaneo, Jansson, and Ma (2019) shows a significant difference between the (bias-corrected robust) density estimate from the right of zero and that from the left of zero. The robust p-value is close to zero. In Figure 3(b), we plot the histogram of *P_CH_EPS* and fit a smooth kernel density function, using the optimal bin size following Bollen and Pool (2009). Figure 3(c) reports the t-statistic for each bin to test whether the actual number of observations significantly deviates from the estimated number from the smooth density shown in Figure 3(b). The results reject the null hypothesis that the underlying density is smooth everywhere. Specifically, the t-statistics for the bin of *P_CH_EPS* just below zero is much higher than 1.96.

Figure 4 shows the corresponding plots for mixed deals. We again observe, consistent with Hypothesis H2(i), that there is a discontinuous increase in the frequency of mixed deals as the zero *P_CH_EPS* threshold is crossed from the right (from positive to negative values). Moreover, as seen from Figure 4(c), the only discontinuity in the distribution occurs at zero. Overall, the evidence is consistent with the hypothesis that as the threshold of non-accretive deals is crossed, to avoid dilution,

more deals are done as cash and mixed deals. However, before arriving at such a conclusion, we need to examine what causes the discontinuity more carefully.

In unreported tests, we find that there is no corresponding dip in the frequency of stock deals as the *P_CH_EPS* is crossed, suggesting that there is an increase in the total number of deals around the zero threshold, most of which are done in cash. This raises the possibility that the discontinuity observed in Figures 3(a) and 4(a) could be mechanical – as the "low buys high" activity picks up post-2002, more deals that are pseudo-dilutive (corresponding to $x_1 > x_2$) are done, and this creates a discontinuity in the number of deals done that feature x_1 slightly higher than x_2. If, for some reason, cash is also a more popular means of payment during this latter period, the discontinuity in Figure 3(a) could be reflecting a general preference for cash in the latter period rather than a preference for cash to avoid dilution from pure stock deals.

To examine whether the discontinuity could be mechanical and attributable to a preference for cash as a means of payment and for deal type (i.e., for $x_1 > x_2$ deals) in the latter period, we conduct two simulation exercises. First, if there was a general preference for cash deals in the latter period, this should be reflected for all types of deals, that is, both pseudo-accretive and pseudo-dilutive cash deals. In our first simulation, we assume that the likelihood of paying cash in any type of deal equals the fraction of cash deals in the subsample of pseudo-accretive deals only. We then assign deal type to each deal in our sample according to this probability. If, contrary to our hypothesis, the discontinuity in Figure 3(a) is *not* driven by a strict preference for cash deals when the deal is pseudo-dilutive, then this simulation should also mechanically generate a discontinuity. In the second simulation exercise, we assume that the probability of cash payment in each sub-period (1991-2001 and 2002-2017) corresponds to the fraction of cash deals in that sub-period (without conditioning on whether the deal is pseudo-accretive or dilutive). The results of these simulation exercises are reported in Table B1 in the Appendix. Panel A reports the difference in the bias-corrected estimates of the densities to the right and left of 0 in Figure 3(a). Panel B reports the frequencies of different deal types in the data. Simulation I is based on the probabilities of deal types reported in the second row of Panel B, while Simulation II is based on those in the last two rows. Panel C reports results of 1000 bootstrap simulations for randomly assigned cash deals for the two simulations. For simulation I, the 95 percent confidence interval includes 0, indicating that the discontinuity in the simulation is not statistically significant. For simulation II, the discontinuity is significant. However, the value in Panel A is larger in absolute value than the 99th percentile value in the second row of Panel C (3.94 compared to 3.39). Thus, we conclude that while the discontinuity in Figure 3(a) could to some extent be attributable to a higher propensity for cash usage in the latter period, it is primarily driven by a desire to avoid dilution near the threshold.

Figure 5 shows the propensity of pure cash deals and the percentage of cash in deal consideration among all completed deals with *P_CH_EPS* within a narrow neighborhood of zero. The

fitted linear lines (using triangular kernels) from both sides of zero indicate a discontinuous change in the tendency to pay cash when *P_CH_EPS* crosses zero. In Table OA1 reported in the Online Appendix, we confirm that these discontinuities are statistically significant at conventional levels. We also find that acquirer and target characteristics as well as the ratio of deal value to acquirer market value are smoothly distributed around the zero *P_CH_EPS* threshold, with the exception of acquirer total assets (Table OA2 in the Online Appendix). Acquirers engaged in pseudo-accretive deals near the threshold are smaller in terms of total assets. Figure OA1 in the Online Appendix shows the discontinuity corresponding to a global higher-order polynomial specification, and Table OA3 presents the corresponding regression results.

We next examine the second part of Hypothesis 2 that some slightly dilutive stock deals are changed into cash deals to be accretive. We focus on the deals that are slightly pseudo-dilutive (*P_CH_EPS* from -0.05 to 0) and slightly pseudo-accretive (*P_CH_EPS* from 0 to 0.05).[26] In Panel A of Table 4, we report the proportion of deals in each group that satisfy the accretion condition (ratio of combined EPS over "repurchase price" exceeding acquirer's after-tax interest rate). First, we find that 73% of cash deals that are slightly pseudo-dilutive satisfy the condition. Second, there is a significantly lower percentage of cash deals that are slightly pseudo-accretive satisfying the condition. A similar pattern is found for the mixed deals. In panel B of Table 4, we report the mean values of $\frac{e_{combine}}{P_B} - (1-\tau)E(R)$ and find similar patterns as in panel A. The evidence is consistent with Hypothesis 2, suggesting that some slightly dilutive stock deals have been replaced by cash and mixed deals.

Another observation from Table 4 is that the proportion of slightly accretive stock deals that satisfy the accretion condition is abnormally low (recall that for stock deals, pseudo and actual accretion/dilution are the same). We will revisit this in Section 5.3 below.

Before leaving this section, it is worthwhile to clarify that while some of the tests discussed above and several subsequent tests have the flavor of regression discontinuity tests, they are in fact quite different. Tests based on regression discontinuity design (RDD) assume that there is no manipulation of the variable on which treatment is based around the threshold. If there is no manipulation and the distribution of this variable is smooth around the threshold, then causal inferences regrading intervention can be made by contrasting outcomes in a small neighborhood either side of the threshold. Our tests, in contrast, are explicitly aimed at demonstrating that there is "bunching" around the threshold, consistent with manipulation.[27] We borrow these tests for bunching from this literature to establish manipulation of deal type in the neighborhood of various thresholds.

[26] The results in Table 4 are robust to using different bandwidths to define slight change in pseudo EPS.
[27] This approach is common in the Public Economics literature – see Kleven and Waseem (2013) and Kleven (2016). For a recent application in Finance, see Babenko, Choi and Sen (2019).

5.2 EPS-Sensitivity versus Misvaluation, and Accounting Rule Changes

As discussed in Section 2.1, an influential theory of stock-financed mergers (Shleifer and Vishny, (2003)) argues that stock mergers can be driven by overvalued acquirers buying less overvalued targets using their stock as currency. This phenomenon is widely believed to have contributed to the merger wave in the 1990s. This argument has similarities with our argument that the dual conditions of a positive premium and EPS accretion can both be met only when the "high buys low" condition holds (that is, when $\frac{P_T}{P_B} < \frac{e_T}{e_B}$, or $\frac{P_T}{e_T} < \frac{P_B}{e_B}$ holds) – hence, stock deals are popular when high buys low, otherwise cash deals are more likely.

Our arguments about the importance of EPS-sensitivity also raise the issue of the possible role an important accounting change that occurred in 2001 might have played. Under the "Pooling" method of accounting (only available for stock-for-stock deals prior to 2001), the book values of target and acquirer could be combined and there was no amortization of goodwill. In contrast, under the "Purchase" method, target assets and liabilities were recognized at fair value. The gap between acquisition price and recognized fair value (the step-up) would be recorded as goodwill, which would be amortized. Thus, the Pooling method was much more EPS-friendly and was the overwhelming method of choice for pure stock deals. The Statement of Financial and Accounting Standards (SFAS) 141 and 142 were adopted in June 2001. SFAS 141 essentially abolished the pooling method of accounting for M&A transactions, so that the purchase method would apply to all transactions. SFAS 142 abolished the goodwill amortization principle, which was replaced by a yearly impairment test procedure. It has been argued (de Bodt, Cousin and Roll, (2017)) that this rule change greatly contributed to the subsequent rapid decline of stock deals.

We contrast our results with the misvaluation hypothesis first. As shown in Table 5, the results reported in Table 2 and Table 3 show that the possibility of accretion's impacts on the propensity for cash, and percentage of cash used in the consideration, are stronger for the sub-period of 2002-2017 compared to the earlier sub-period (1991-2001). The discontinuity corresponding to Figure 3(a) is also only significant for the later sub-period (this result is not shown separately). One reason for the weaker results for our tests for the earlier sub-period has to do precisely with the misvaluation theory. Figure 6 shows the time trends in the proportion of stock (cash) deals and their correlations with the proportion of pseudo-accretive (pseudo-dilutive) deals. It is noticeable that in the earlier sub-period, many stock deals were done that were pseudo-dilutive, in contrast to the later sub-period. This could have been because targets were willing to accept potentially overvalued acquirer stock only if the premium was substantial, resulting in dilutive deals. In other words, the EPS-accretion constraint did not bind as tightly during this period, but only took effect in the later period, once overvaluation disappeared.

The accounting rule change no doubt contributed to the decline in the popularity of stock deals post-2001. However, our results show that another factor contributed to this – the emergence of the

"low buys high" phenomenon, which makes stock deals dilutive, leading EPS-sensitive managers to switch to more accretive cash deals. Moreover, the EPS-sensitivity we document is distinct from the accounting treatment of goodwill and its effect on earnings, since goodwill amortization was essentially abolished after 2001.

5.3 The (Curious) Case of Slightly Accretive Pure Stock Deals

Figure 7 shows that there are disproportionately more deals incurring slight EPS accretion for the acquirer than incurring slight dilution, among the pure stock deals with $x_1 \leq x_2$. The latter restriction leaves out deals that cannot be accretive if paid for only in the acquirer's stock. The distribution is discontinuous at acquirer's change in EPS =0 (statistically significant at 5% level). This is consistent with Hypothesis 3, and the prediction that the acquirer prefers slightly accretive deals to slightly dilutive ones.[28]

The puzzling aspect of this result is why, if the objective is to avoid dilution, these slightly accretive deals have to be entirely in stock. If the distribution of bargaining power between the target and the acquirer results in a dilutive stock deal, as we have noted before, one possibility is to add cash so that the deal remains accretive, yet entails no sacrifice of premium for the target.[29] Yet, we observe a significant cluster of accretive stock deals at the discontinuity point of zero change in EPS. There are several possible reasons for this, as we explain below.

One possibility is that some of these deals would not have met the accretion condition required for cash or mixed deals to be preferred to pure stock deals. Evidence for this can be seen in Panel A of Table 4. The proportion of slightly accretive pure stock deals that satisfy the accretion condition is abnormally low. Thus, for such deals, if these would be dilutive given the deal synergies and the distribution of bargaining power between target and acquirer, the only way to avoid dilution would be to do an accretive stock deal. Adding cash would lower the acquirer's EPS.

The second possibility is that if the cash required is a relatively small amount, the fixed costs of cash distribution and the tax obligations that this would trigger for the target shareholders may not make it worthwhile for the target to bargain for the extra premium. Some amount of cash payment would also adversely affect the tax-free status of the deal. Indeed, the loss of premium can be quite

[28] To further explore the acquirer's dilution sensitivity, we examine the excluded deals with $x_1 > x_2$. Using the difference x_1-x_2 to capture EPS dilution pressure, in Table OA4 in the Online Appendix we find that stock deals are associated with significantly smaller x_1-x_2 compared with the cash deals with the same level of deal size relative to acquirer size.

[29] In Appendix Figure B1, we show that when pseudo-dilutive deals are paid with both cash and stock, the actual change in EPS is generally slightly positive, suggesting that cash is added to make these deals accretive.

substantial since under some circumstances, adding sufficient cash would change the tax status of the deal, or lead to a different form of reorganization.[30]

Both these arguments assume that these deals involve some sacrifice of the premium for target shareholders because target management is keen to do the deal. In Table 6, consistent with Hypothesis 4(i), we first show that, under the condition that $x_1 \leq x_2$, slightly accretive pure stock deals involve lower acquisition premiums than slightly dilutive pure stock deals and slightly accretive mixed deals. Then, we examine whether large Golden Parachute payments for target shareholders could be the reason why such deals are not done with a combination of stock and cash. What we find in results reported in Table 7 is that, while dilution pressure increases the likelihood of a mixed deal relative to a pure stock deal, this effect is significantly mitigated if the target management has larger Golden Parachute payments.[31] This result is broadly consistent with the arguments above that for a number of reasons acquirer and target management may prefer not to add cash to the deal, but acquirer management insists on an a premium that produces EPS accretion. Target management would be more willing to acquiesce to the acquirer's position when they would benefit from seeing the deal completed, as, for example, when large Golden Parachute payments are involved. This is consistent with Hypothesis 4(ii).

Since the accretive EPS impact of a deal may have nothing to do with deal NPV, it is highly likely that the focus on EPS distorts the types of deals that are made. Slightly accretive deals are especially interesting from this point of view as they seem to be driven by the importance of EPS accretion for the acquirer, and target management incentives to do such deals even at the cost of a lower premium. These slightly accretive deals can be contrasted with slightly dilutive deals, which are done in spite of their adverse EPS impact, presumably on the merits of the deal. For example, the latter types of deals could be associated with more clearly identifiable sources of deal synergy which might be credibly conveyed to the market post-announcement and help realize deal completion. In Table 8 we report OLS regression results where the main explanatory variable of interest is an indicator variable indicating whether the change in EPS (*CH_EPS*) is positive. We control for polynomial terms (up to 3rd order) of *CH_EPS*, target and acquirer characteristics and include various fixed effects. The first 3 columns report results when the dependent variable is the acquirer's cumulative abnormal return from day -1 to +1. The coefficient of the *D(CH_EPS>0)* indicator variable is significantly positive. For small values of CH_EPS, as the contribution of the polynomial terms goes to zero, the indicator variable

[30] Under Internal Revenue Code 368, a deal can be considered as "tax-free reorganization" (which means the target does not need to pay tax at the entity level) if more than 40% of deal consideration is in stock given other regulatory criteria are satisfied. Other regulatory requirements tend to be more stringent when the proportion of cash in consideration increases. For instance, Type A tax-free reorganization requires no less than 40% stock as consideration, but all the target's liabilities have to be acquired. Type B, on the other hand, does not require acquiring the target's liabilities, but instead, 100% deal consideration has to be in stock.

[31] We hand collect the amount of Golden Parachute received by the target managers for each deal from the SEC forms of S-4, DEFM 14A, and SC14D9 in Edgar database. The base salary and total compensation come from ExecuComp.

compares deals that are slightly accretive to those that are slightly dilutive. Thus, the results indicate that the market reaction is more positive for slightly accretive stock deals than for slightly dilutive ones. In columns (4)-(6), the dependent variable is the combined cumulative abnormal returns of target and acquirer from 42 trading days before the announcement to deal completion, which is a standard way to calculate deal synergy. In columns (7)-(9), the dependent variable is the acquirer's cumulative abnormal return. The coefficient of *D(CH_EPS>0)* is significant and negative in these columns, suggesting that the slightly accretive deals are worse in terms of deal NPV as well as for the acquirer shareholders, consistent with Hypothesis 5.

5.4 Why Do Managers Care about EPS-Sensitivity?

The results documented so far support the general hypothesis that deal making is sensitive to the impact on EPS, which is consistent with the observation made earlier that the impact on EPS features prominently in the way deals are announced in the media. Investment bankers advising their clients on M&A transactions routinely do a "dilution analysis", also known as a "merger consequences analysis". Form S-4 filings also often provide information on the combined EPS analysis in comparison with the stand-alone EPS of the acquirer and target firm.

In this section, we explore which factors contribute to EPS-sensitivity of managers. We first show that shareholder approval of deals is an important factor behind managerial preference for accretive deals. Next, we show that ownership by institutional investors who are more short-term oriented influences the sensitivity of deal structure to EPS impact. Finally, we show that managers are more concerned about the EPS impact of deals when their compensation is tied to EPS.

5.4.1 Shareholder Voting and EPS-Sensitivity

While managers may care about how shareholders evaluate a deal for many reasons, the most obvious context is when shareholder approval is necessary for a deal to go through. In all three major U.S. exchanges, when the shares issued to finance a deal exceeds 20% of the outstanding shares, shareholder vote is a requirement.

In Table 9, we report OLS regression results to test Hypotheses 6(i). The dependent variable is the percentage of cash in deal consideration among all deals. The independent variable of interest is the amount of shares that would have to be issued had the deal been done as a pure stock deal ("pseudo issuance"). We include an indicator variable corresponding to when this exceeds 20%, as well as polynomial terms of the difference between pseudo issuance and the 20% threshold. We test for discontinuity around the 20% threshold for this variable. We find that the coefficient of the indicator variable indicating that the pseudo share issuance exceeds 20% is significantly positive, consistent with our hypotheses. The last six columns show that the discontinuity is only present for the subsample of deals with *P_CH_EPS*<0.

Next, we examine the impact of EPS accretion on deal completion rates. Institutional shareholders can communicate displeasure about management decisions directly, even without voting, and managers, responding to such feedback, should be more likely to withdraw deals that are not supported by shareholders. Panel A in Table 10 presents some summary information about accretive and dilutive deals and deal completion rates. Dilutive deals are about 2% more likely to be withdrawn than accretive deals. Given that the average withdrawal rate is 10%, this is a substantial difference. Contrasting deeply dilutive deals (defined as deals in the bottom quartile of dilution for pure stock deals) with all other stock deals, we find that the withdrawal rate for deeply dilutive deals is twice as high (16%) as other deals (8%). These results are consistent with Hypothesis 6(ii).

Regression results provide further evidence that EPS impact of stock deals matters for deal completion. Panel B Table 10 presents the results where the dependent variable is one for completed deals and zero for withdrawn, and the independent variable of interest is an indicator variable denoting that the change in acquirer EPS is negative. We include polynomial terms for the change in EPS (*CH_EPS*) and other control variables. The indicator variable's coefficient is significantly negative for regressions on the overall sample of stock deals, reported in the first 3 columns. Moreover, results from the remaining columns indicate that this effect is entirely confined to deals involving greater than 20% share issuance, confirming Hypothesis 6(iii).

5.4.2 Acquirer Investors' Horizon

One of the key reasons that the EPS matters for acquirer managers is myopic shareholders. We next examine whether acquirers that are largely held by short-term investors are more sensitive to EPS dilution (Hypothesis 7). We measure the acquirer's short-term ownership using the weighted average institutional investors' churn rate[32] two quarters before the deal announcement. As illustrated in Table 11, when its institutional investors have a higher churn rate, the acquirer is more likely to announce a slightly accretive rather than slightly dilutive stock deal in the sample with $x_1 \leq x_2$. Moreover, we also find that acquirers with higher investor churn rate are more likely to make accretive rather than dilutive deals in the larger samples of stock deals with $x_1 \leq x_2$ and of all stock deals.

5.4.3 CEO Compensation with EPS as Vesting Hurdles

CEO compensation has been criticized for over-emphasizing short-term performance measures such as EPS and distorting managerial incentives. We examine whether having EPS as a performance metric in a CEO's incentive plan affects the method of payment and deal outcomes (Hypothesis 8). We match the acquirers in our sample of mergers to Incentive Lab, which collects information on the performance

[32] Following Gaspar, Massa, and Matos (2005), Yan and Zhang (2009) among others, we first calculate each institutional investor's quarterly churn rate from their portfolio positions. Next, we calculate a four-quarter moving-average churn rate for each quarter-institution. Last, we aggregate the moving-average churn rate of all the institutions holding one stock, using their ownership in that stock as the weight.

metrics of incentive plans granted to top managers of large US public firms. We restrict our attention to the deals after 2006, since the disclosure of performance metrics in compensation is more complete since 2006. To measure how much the CEOs care about EPS due to their compensation package, we calculate the value of unvested incentive plans with EPS as one of the performance metrics at the time of deal announcement. The value of unvested compensation is scaled by the three-year average salary for the CEO. Limited by the coverage of Incentive Lab and the more recent sample period, we end up with a much smaller sample of deals with available data on acquirer managers' compensation. In the first four columns of Table 12, we find that the higher is the value of unvested compensation directly linked to EPS, the more likely a deal is paid with cash. To validate our hypothesis, we also calculate the value of unvested compensation linked to total earnings (such as earnings, EBT, EBITDA, etc.). The measures on total earnings should reflect the same economic rationale as EPS, except that they do not punish the new share issuance as in a stock merger. We find that CEO compensation linked to total earnings does not have a significant impact on the method of payment in mergers.

Next, we test whether linking payment to EPS affects the likelihood of making accretive deals in the sample of stock and mixed deals. In the last four columns of Table 12, we find that the higher is the value of unvested compensation linked to EPS, the more likely is the acquirer to make an accretive deal. Again the unvested compensation linked to total earnings is insignificant.

Overall, the results in sections 5.4 suggest that even when acquirer CEOs know that EPS should not influence their merger decisions, there are circumstances when the EPS impact cannot be ignored. For example, when shareholder voting support is required, but reliable synergy estimates and not available, EPS is almost the only metric readily available to shareholders, and the EPS impact of a deal becomes extremely important. External incentives created by short-term focused shareholders or internal incentives from their own compensation plan can also force managers to consider EPS effects, and when they do so, what should otherwise be a straightforward investment decision is likely to be distorted.

6. Conclusion

Merger announcements are very often accompanied by discussions of the impact of the deal on the acquirer's EPS when the deal is financed with stock. We show that this reflects the acquirer management's focus on whether the deal will be EPS-accretive. This focus not only affects how deals are paid for, but also the acquisition premium, and the types of deals that occur. We find that acquirers' EPS-sensitivity is related to short-termism of its shareholders as well as the inclusion of EPS as a performance metric in the CEO's compensation contract. Our results do not imply that EPS accretion is the primary driver of mergers; indeed, many dilutive deals are proposed and completed. Rather, we show that while efficiency would require that the NPV of the acquisition, as determined by the total synergies created and the split between the acquirer and target, should be the only consideration in

determining which deals get done, the EPS impact of the deal is also an important factor, and this factor distorts merger decisions.

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Figure 1: Time trend of three types of deals

The figures show the fractions of three types of completed deals between two US public firms announced in each calendar year from 1991 to 2017.

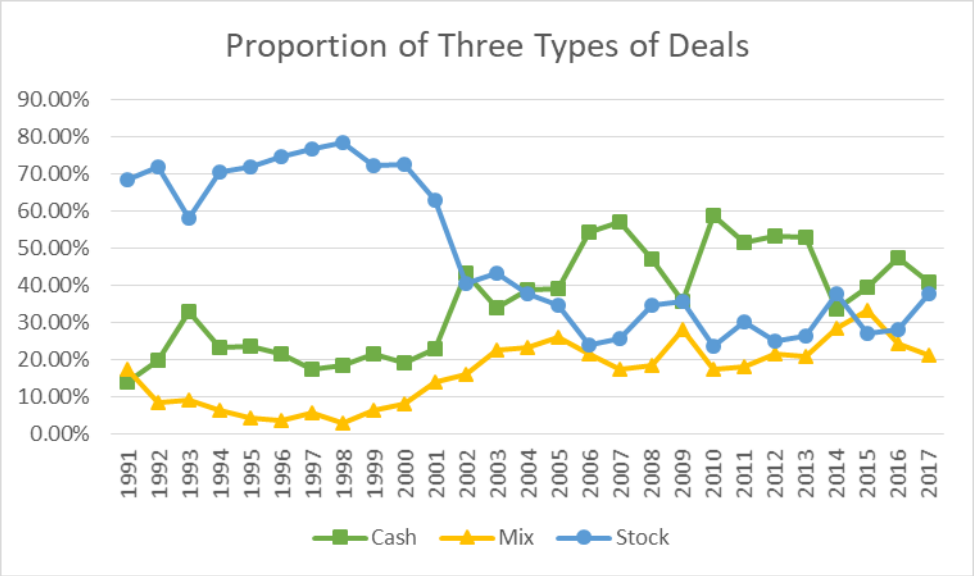
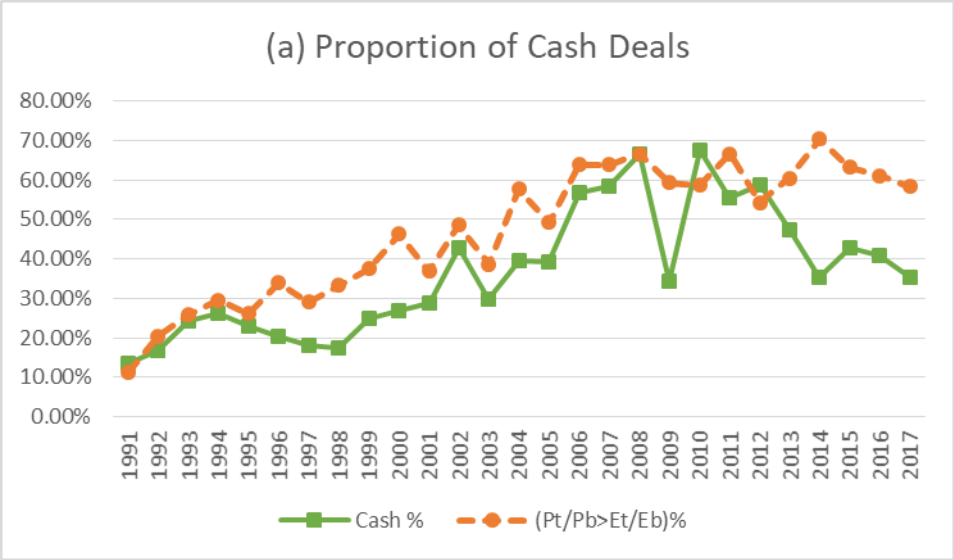


Figure 2: Time trend of cash (stock) deals and deals with $\frac{p_t}{p_b} > \frac{e_t}{e_b}$ ($\frac{p_t}{p_b} \leq \frac{e_t}{e_b}$)

Subfigure (a) shows the fraction of completed cash deals and deals with $\frac{p_t}{p_b} > \frac{e_t}{e_b}$ announced in each calendar year. Subfigure (b) shows the fraction of completed stock deals and deals with $\frac{p_t}{p_b} \leq \frac{e_t}{e_b}$ announced in each calendar year. The sample includes the completed deals with positive EPS for both the acquirer and target.



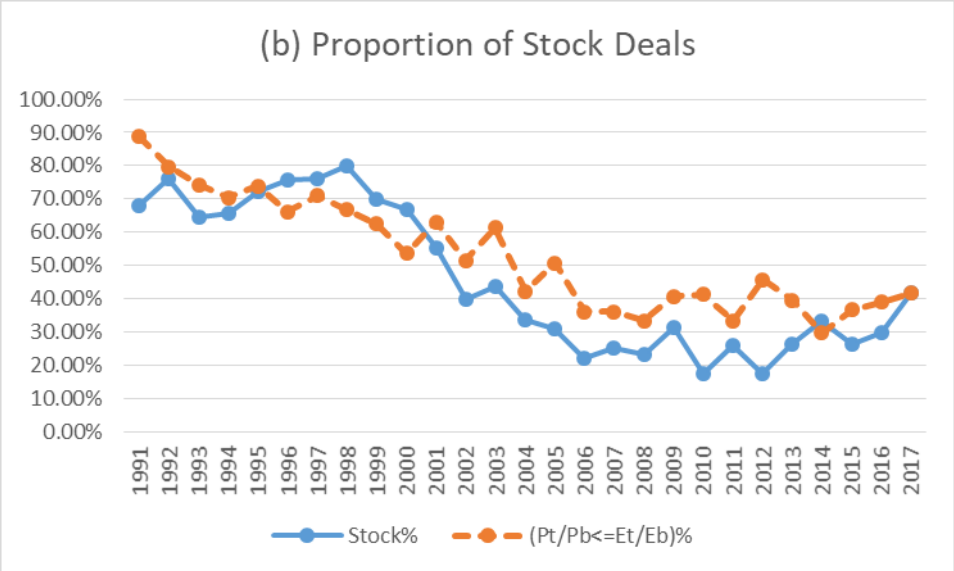


Figure 3: Distribution of pseudo change in EPS among cash deals

Subfigure (a) shows the local-polynomial density estimations (Cattaneo, Jansson, and Ma (2019)) of *P_CH_EPS* from both sides of zero (using the unrestricted model with up to 3rd order polynomial terms) among the completed cash deals. We choose the optimal bandwidths for both sides following Cattaneo, Jansson, and Ma (2019), which are reported in the subtitle. The shadow area indicates 95% confidence interval using jackknife standard errors. The subtitle also reports the robust (bias-corrected) p-value of the difference between the left and right density around zero. In subfigure (b), we report the histogram of *P_CH_EPS* using the optimal bin size following Bollen and Pool (2009), and fit a smooth density function. Subfigure (c) reports the t-statistic for the difference between the actual numbers of observations in each bin and the estimated number of observations from the smooth density in (b). The dashed lines indicate the 95% confidence interval for the t-statistic. *P_CH_EPS* is winsorized at 1 percentile on both sides. (b) and (c) plot the 5 to 95 percentile of the distribution.

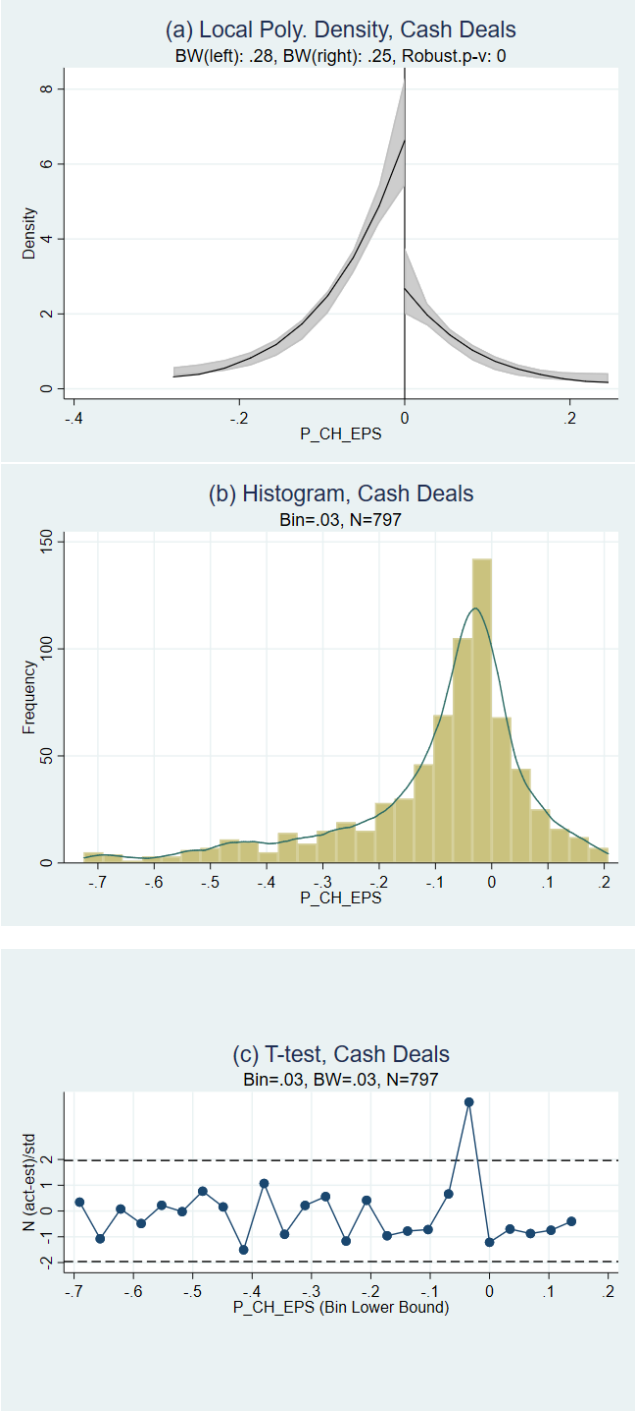


Figure 4: Distribution of pseudo change in EPS among mixed deals

Subfigure (a) shows the local-polynomial density estimations (Cattaneo, Jansson, and Ma (2019)) of *P_CH_EPS* from both sides of zero (using the unrestricted model with up to 3rd order polynomial terms) among the completed mixed deals. We choose the optimal bandwidths for both sides following Cattaneo, Jansson, and Ma (2019), which are reported in the subtitle. The shadow area indicates 95% confidence interval using jackknife standard errors. The subtitle also reports the robust (bias-corrected) p-value of the difference between the left and right density around zero. In subfigure (b), we report the histogram of *P_CH_EPS* using the optimal bin size following Bollen and Pool (2009), and fit a smooth density function. Subfigure (c) reports the t-statistic for the difference between the actual numbers of observations in each bin and the estimated number of observations from the smooth density in (b). The dashed lines indicate the 95% confidence interval for the t-statistic. *P_CH_EPS* is winsorized at 1 percentile on both sides. (b) and (c) plot the 5 to 95 percentile of the distribution.

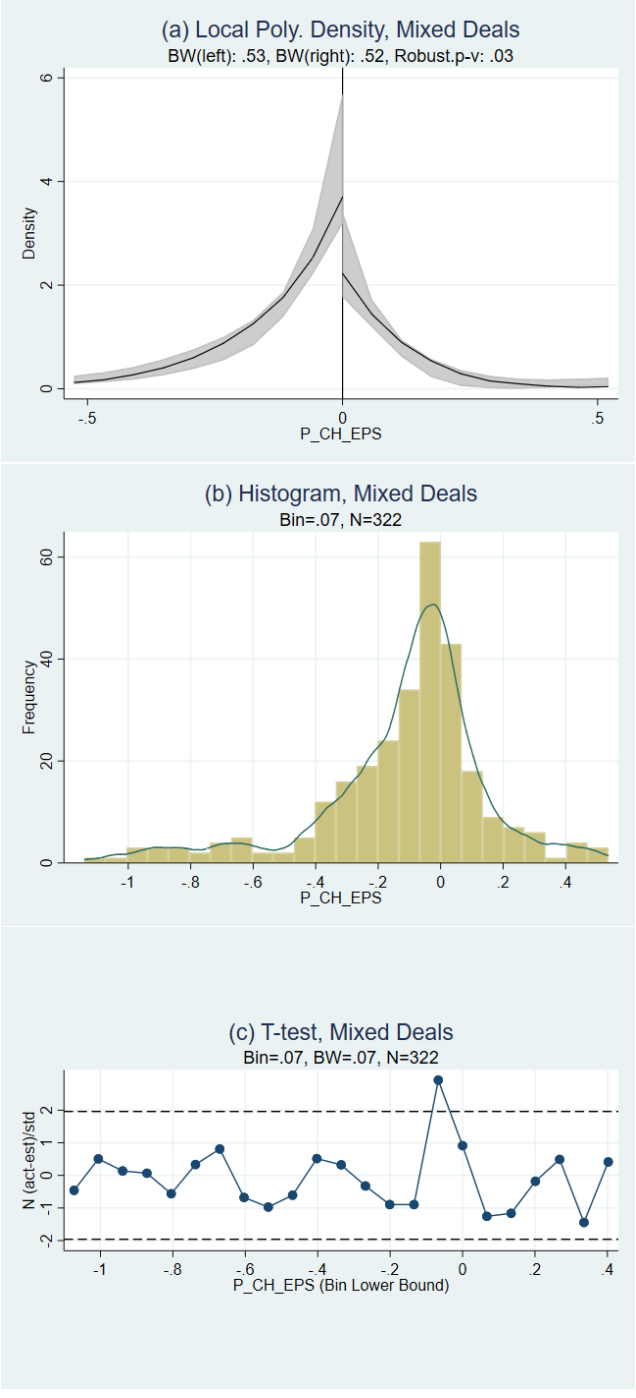


Figure 5: Tendency of paying cash around zero of pseudo change in EPS

Subfigure (a) shows the fraction of cash deals in each bin of *P_CH_EPS*. Subfigure (b) shows the mean level of fraction of cash in deal consideration in each bin of *P_CH_EPS*. The figures plot the deals within the narrow neighborhood of zero. The bandwidths are chosen using the mean squared error-optimal rule (Calonico, Cattaneo and Titiunik (2014)) allowing for different bandwidths on two sides of the threshold. Observations are grouped into evenly-spaced bins on both side of zero. The lines are fitted linear functions from both sides of zero using triangular kernel. The sample contains all the completed deals. *P_CH_EPS* is winsorized at 2.5 percentiles on both sides.

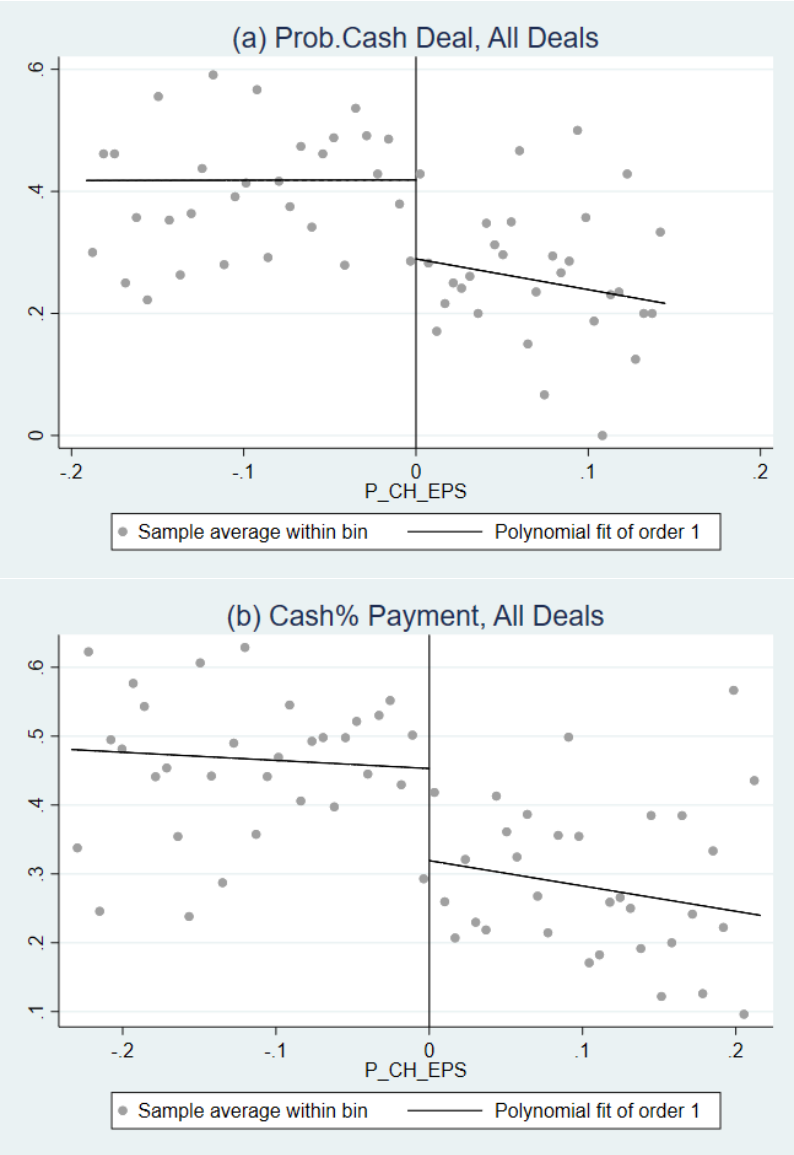
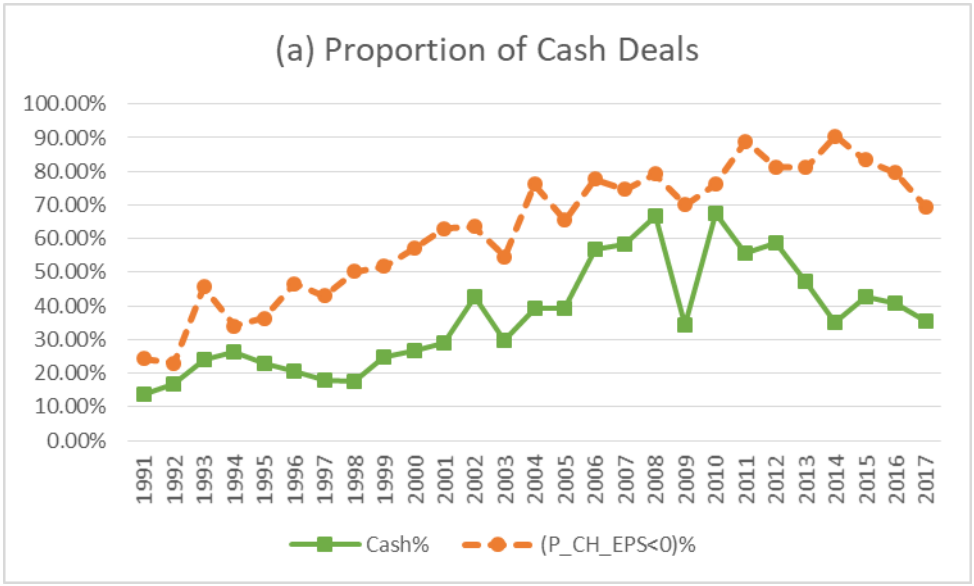


Figure 6: Time trend of cash (stock) deals and pseudo-dilutive (accretive) deals

Subfigures (a) shows the fraction of cash deals along with those of deals with *P_CH_EPS*<0 announced in each calendar year. Subfigures (b) shows the fraction stock deals along with those of deals with *P_CH_EPS*≥0. To keep consistent with Figures 2, the sample contains only the completed deals with positive EPS for both the acquirer and target.



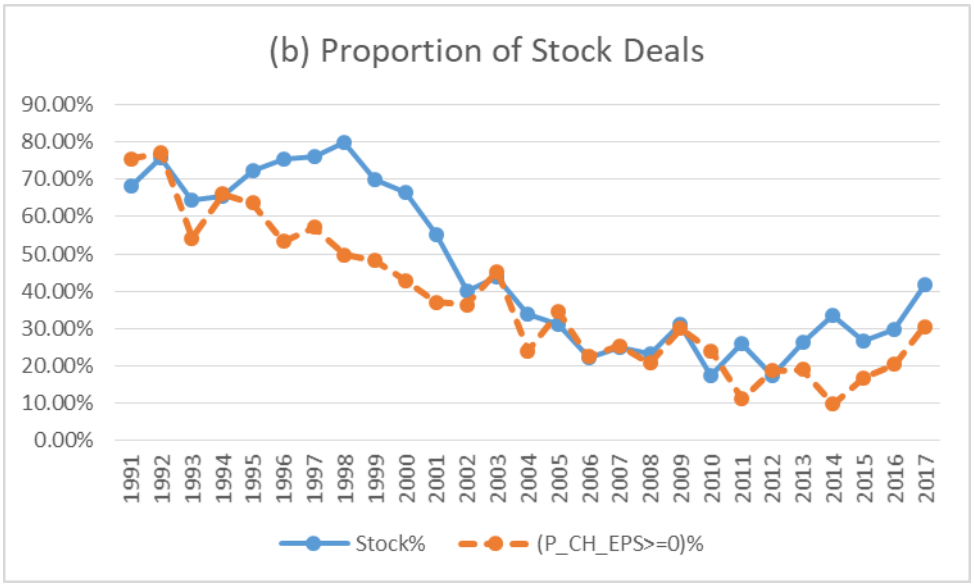
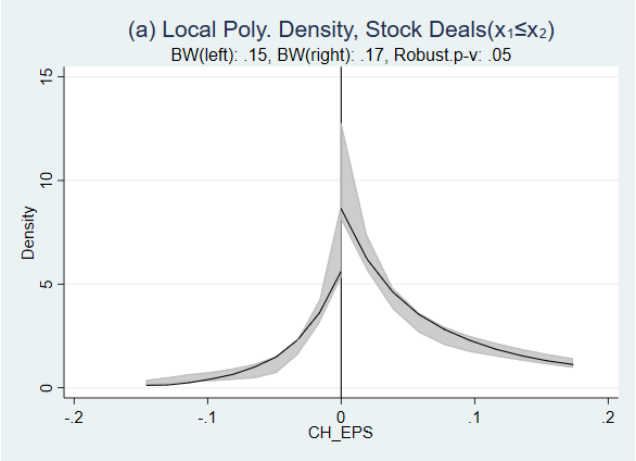
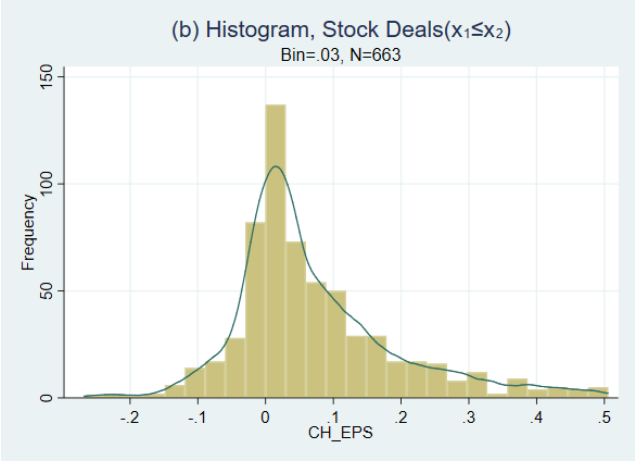


Figure 7: Distribution of change in EPS among stock deals with $x_1 \leq x_2$

Subfigure (a) shows the local-polynomial density estimations (Cattaneo, Jansson, and Ma (2019)) of *CH_EPS* from both sides of zero (using the unrestricted model with up to 3rd order polynomial terms) among the completed stock deals with $x_1 \leq x_2$. We choose the optimal bandwidths for both sides following Cattaneo, Jansson, and Ma (2019), which are reported in the subtitle. The shadow area indicates 95% confidence interval using jackknife standard errors. The subtitle also reports the robust (bias-corrected) p-value of the difference between the left and right density around zero. In subfigure (b), we report the histogram of *CH_EPS* using the optimal bin size following Bollen and Pool (2009), and fit a smooth density function. Subfigure (c) reports the t-statistic for the difference between the actual numbers of observations in each bin and the estimated number of observations from the smooth density in (b). The dashed lines indicate the 95% confidence interval for the t-statistic. *CH_EPS* is winsorized at 1 percentile on both sides. (b) and (c) plot the 1 to 95 percentile of the distribution.





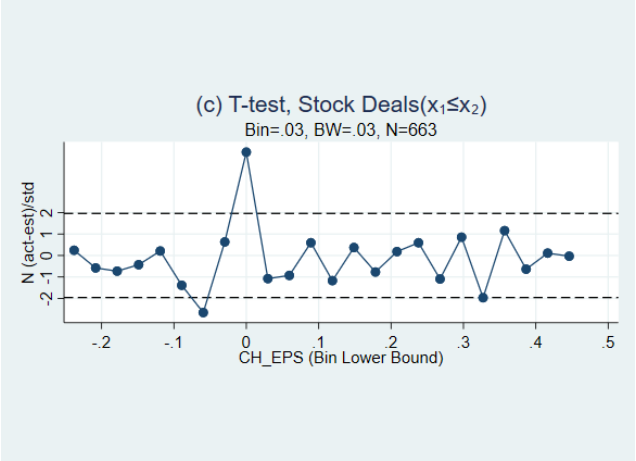


Table 1: Sample Overview

Panel A shows the number and fraction of each type of completed deal associated with different EPS conditions of the target and acquirer. Panel B shows the number and proportion of each type of completed deal associated with different relative relation between x_1 (P_T/P_B) and x_2 (e_T/e_B). The square brackets show the column percentages, while the parentheses report the row percentages.

Panel A:

Deal Type	EPS(Acq)≤0	EPS(Acq)>0, EPS(Tar)≤0	EPS(Acq)>0, EPS(Tar)>0	Missing EPS	Total
Cash	30	161	642	24	857
	[11.07%]	[42.59%]	[31.32%]		[30.65%]
	(3.50%)	(18.79%)	(74.91%)		
Mix	36	48	274	7	365
	[13.28%]	[12.70%]	[13.37%]		[13.05%]
	(9.86%)	(13.15%)	(75.07%)		
Stock	205	169	1134	66	1574
	[75.65%]	[44.71%]	[55.32%]		[56.29%]
	(13.02%)	(10.74%)	(72.05%)		
Total	271	378	2050	97	2796
	(9.69%)	(13.52%)	(73.32%)		

Panel B:

	Both EPS>0, P>0			Missing	Total
Deal Type	$x_1 \leq x_2$	$x_1 > x_2$	**Total**	x_1, x_2	
Cash	277	347	624	233	857
	(44.39%)	(55.61%)			
	[24.43%]	[41.26%]	[31.59%]		[30.65%]
Mix	144	125	269	96	365
	(53.53%)	(46.47%)			
	[12.70%]	[14.86%]	[13.62%]		[13.05%]
Stock	713	369	1082	492	1574
	(65.90%)	(34.10%)			
	[62.87%]	[43.88%]	[54.78%]		[56.29%]
Total	1134	841	1975	821	2796
	(57.42%)	(42.58%)			

Table 2: Dilution pressure and cash consideration

The left panel reports the average marginal effects of Logit regressions for the propensity of cash deals. The right panel reports the coefficients of Tobit regressions for the fraction of cash in deal payments. The main explanatory variable is an indicator for x_1 larger than x_2. Control variables include the acquirer's characteristics reflecting its capital structure and deal characteristics (defined in the appendix). Each variable is winsorized at 1% on both sides. Year dummies indicate the calendar year when the deal is announced. Industry dummies indicate the Fama-French 49 industry of the acquirer and target. An intercept is included but not reported. The sample contains the completed merger deals with positive EPS for both the acquirer and target. In the left panel, Z-statistics are reported in parenthesis, using the standard error clustered on year or acquirer industry level (when acquirer industry dummies are controlled for). In the right panel, t-statistics are reported in parenthesis, using robust standard errors. *, **, and *** indicate statistical significance at 10%, 5%, and 1% level, respectively.

	Prob. Cash Deal			**Cash% in Consideration**		
D(x_1>x_2)	0.051***	0.053**	0.055**	0.34***	0.33***	0.33***
	(2.85)	(2.37)	(2.33)	(2.83)	(2.87)	(2.89)
ln(At) Acq	-0.015**	-0.0075	-0.0087	-0.061	-0.026	-0.032
	(-2.13)	(-0.88)	(-0.99)	(-1.55)	(-0.68)	(-0.86)
Book Lev. Acq	-0.020	-0.073	-0.065	-0.31	-0.48	-0.40
	(-0.23)	(-0.98)	(-0.83)	(-0.71)	(-1.09)	(-0.89)
MTB Acq	-0.0064	-0.011**	-0.014**	-0.047**	-0.085***	-0.093***
	(-1.63)	(-2.08)	(-2.27)	(-2.18)	(-3.81)	(-4.08)
D(Dividend) Acq	-0.049**	-0.022	-0.015	-0.46***	-0.21	-0.16
	(-2.29)	(-0.96)	(-0.71)	(-3.05)	(-1.35)	(-1.10)
Cash Hold Acq	-0.054	-0.091	-0.072	-0.14	-0.26	-0.20
	(-1.35)	(-1.53)	(-1.23)	(-0.51)	(-0.88)	(-0.70)
R&D Acq	-0.12	-0.56	-0.60*	-1.93*	-4.60***	-4.51***
	(-0.60)	(-1.62)	(-1.74)	(-1.83)	(-3.48)	(-3.41)
Tangibility Acq	0.14**	0.13*	0.16*	1.14***	0.83	1.00*
	(2.33)	(1.69)	(1.94)	(3.81)	(1.55)	(1.79)
DealValue/MktCap	-0.36***	-0.34***	-0.34***	-1.58***	-1.55***	-1.51***
	(-8.21)	(-9.85)	(-9.61)	(-6.78)	(-6.83)	(-6.75)
Tender Offer	0.48***	0.42***	0.42***	4.01***	3.53***	3.51***
	(13.02)	(9.96)	(9.25)	(12.78)	(11.90)	(11.67)
Same SIC2	-0.061***	-0.0071	-0.0078	-0.40***	-0.0079	-0.045
	(-2.86)	(-0.35)	(-0.39)	(-3.07)	(-0.06)	(-0.32)
Year	YES	YES	YES	YES	YES	YES
Acq Industry	NO	YES	YES	NO	YES	YES
Tar Industry	NO	NO	YES	NO	NO	YES
Observations	1905	1881	1864	1905	1894	1890
Pseudo R-squared	0.358	0.410	0.434	0.268	0.305	0.327

Table 3: Pseudo dilution and cash consideration

The left panel reports the average marginal effects of Logit regressions for the propensity of cash deals. The right panel reports the coefficients of Tobit regressions for the fraction of cash in deal payments. The main explanatory variable is an indicator for pseudo dilution *(P_CH_EPS<0*). Control variables include the acquirer's characteristics reflecting its capital structure and deal characteristics (defined in the appendix). Each variable is winsorized at 1% on both sides. Year dummies indicate the calendar year when the deal is announced. Industry dummies indicate the Fama-French 49 industry of the acquirer and target. An intercept is included but not reported. The sample contains the completed merger deals with positive EPS for both the acquirer and target. (The results are robust to further include negative-EPS deals.) In the left panel, Z-statistics are reported in parenthesis, using the standard error clustered on year or acquirer industry level (when acquirer industry dummies are controlled for). In the right panel, t-statistics are reported in parenthesis, using robust standard errors. *, **, and *** indicate statistical significance at 10%, 5%, and 1% level, respectively.

	Prob. Cash Deal			**Cash% in Consideration**		
D(*P_CH_EPS<0*)	0.055***	0.056*	0.057	0.43***	0.40***	0.40***
	(2.69)	(1.67)	(1.58)	(3.15)	(3.01)	(3.07)
ln(At) Acq	-0.015**	-0.0079	-0.0091	-0.053	-0.023	-0.028
	(-1.98)	(-0.93)	(-1.00)	(-1.28)	(-0.56)	(-0.70)
Book Lev. Acq	-0.023	-0.066	-0.048	-0.31	-0.35	-0.22
	(-0.26)	(-0.91)	(-0.63)	(-0.69)	(-0.75)	(-0.47)
MTB Acq	-0.0063	-0.011**	-0.014**	-0.045**	-0.085***	-0.094***
	(-1.55)	(-2.01)	(-2.29)	(-2.03)	(-3.75)	(-4.08)
D(Dividend) Acq	-0.053**	-0.025	-0.016	-0.51***	-0.23	-0.18
	(-2.31)	(-1.13)	(-0.77)	(-3.19)	(-1.45)	(-1.16)
Cash Hold Acq	-0.063	-0.10	-0.079	-0.14	-0.26	-0.20
	(-1.51)	(-1.52)	(-1.28)	(-0.46)	(-0.80)	(-0.68)
R&D Acq	-0.15	-0.53	-0.55	-2.20**	-4.51***	-4.29***
	(-0.75)	(-1.47)	(-1.59)	(-2.00)	(-3.33)	(-3.21)
Tangibility Acq	0.15**	0.15**	0.18**	1.21***	0.91	1.08*
	(2.36)	(2.00)	(2.19)	(3.79)	(1.62)	(1.87)
DealValue/MktCap	-0.37***	-0.36***	-0.36***	-1.75***	-1.72***	-1.69***
	(-8.39)	(-10.22)	(-10.39)	(-6.98)	(-7.05)	(-6.99)
Tender Offer	0.49***	0.42***	0.43***	4.06***	3.55***	3.55***
	(12.78)	(9.82)	(9.06)	(12.43)	(11.55)	(11.29)
Same SIC2	-0.062***	-0.0072	-0.012	-0.43***	-0.045	-0.12
	(-2.82)	(-0.36)	(-0.56)	(-3.17)	(-0.31)	(-0.80)
Year	YES	YES	YES	YES	YES	YES
Acq Industry	NO	YES	YES	NO	YES	YES
Tar Industry	NO	NO	YES	NO	NO	YES
Observations	1805	1781	1765	1805	1795	1791
Pseudo R-squared	0.357	0.409	0.434	0.268	0.307	0.331

Table 4: Accretion Conditions for slightly pseudo-accretive and dilutive deals

Panel A reports the proportion of deals satisfying the accretion condition, which is that the ratio of combined EPS and "repurchase price" exceeds after-tax borrowing costs. The combined EPS is calculated using the pseudo exchange ratio. The "repurchase price" is measured with the acquirer's stock price one day before/ after deal announcement. The slightly accretive deals are defined as the ones with *P_CH_EPS* in (0, +0.05), while the slightly dilutive ones have *P_CH_EPS* in (-0.05, 0). Panel B reports the mean level of the ratio of combined EPS and "repurchase price" minus after-tax borrowing costs. Each variable is winsorized at 1 percentile on both sides. t-tests are conducted between the slightly accretive and dilutive deals for each deal type. *, **, and *** indicate statistical significance at 10%, 5%, and 1% level, respectively.

Panel A: Probability of satisfying accretion condition

	EPS(C)/P[t-1,Acq]>(1-0.34)E[R]				**EPS(C)/P[t+1,Acq]>(1-0.34)E[R]**			
	P_CH_EPS		**Diff**	**t-stat**	***P_CH_EPS***		**Diff**	**t-stat**
	(-0.05, 0)	**(0, +0.05)**			**(-0.05, 0)**	**(0, +0.05)**		
Stock	0.605	0.398	0.207***	(4.067)	0.610	0.409	0.201***	(3.940)
Obs	195	176	371		195	176	371	
Mixed	0.707	0.500	0.207*	(1.765)	0.732	0.467	0.265**	(2.282)
Obs	41	30	71		41	30	71	
Cash	0.734	0.487	0.247***	(3.722)	0.723	0.474	0.249***	(3.748)
Obs	184	76	260		184	76	260	

Panel B: Mean of accretion condition

	EPS(Combine)/P[t-1;Acq] - (1-0.34)E(R)				**EPS(Combine)/P[t+1;Acq] - (1-0.34)E(R)**			
	P_CH_EPS		**Diff**	**t-stat**	***P_CH_EPS***		**Diff**	**t-stat**
	(-0.05, 0)	**(0, +0.05)**			**(-0.05, 0)**	**(0, +0.05)**		
Stock	0.001	-0.015	0.016***	(2.730)	0.002	-0.014	0.016***	(2.673)
Obs	195	176	371		195	176	371	
Mixed	0.005	-0.008	0.012	(0.807)	0.006	-0.007	0.013	(0.878)
Obs	41	30	71		41	30	71	
Cash	0.016	-0.002	0.018***	(3.912)	0.016	-0.002	0.018***	(3.976)
Obs	184	76	260		184	76	260	

Table 5: Tendency of paying cash: subsample results

This table reports the sub-sample results for Table 2 (Panel A) and Table 3 (Panel B). The specifications resemble the corresponding tables. The same set of control variables as the corresponding tables are included but not reported.

Panel A:

	Prob. Cash Deals			**Cash% in Consideration**		
			Subsample: 1991-2001			
D(x_1>x_2)	0.036**	0.037	0.033	0.41	0.35	0.36
	(2.22)	(1.28)	(1.20)	(1.32)	(1.17)	(1.23)
			Subsample: 2002-2017			
D(x_1>x_2)	0.048	0.061**	0.056**	0.19*	0.23**	0.20**
	(1.23)	(2.18)	(2.23)	(1.73)	(2.33)	(2.07)
Control Variables	YES	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES	YES
Acq Industry	NO	YES	YES	NO	YES	YES
Tar Industry	NO	NO	YES	NO	NO	YES

Panel B:

	Prob. Cash Deals			**Cash% in Consideration**		
			Subsample: 1991-2001			
D(*P_CH_EPS<0*)	0.021	0.021	0.016	0.19	0.13	0.082
	(1.56)	(0.51)	(0.40)	(0.59)	(0.41)	(0.27)
			Subsample: 2002-2017			
D(*P_CH_EPS<0*)	0.070	0.092**	0.078**	0.38***	0.40***	0.35***
	(1.47)	(2.08)	(2.08)	(2.83)	(3.20)	(2.96)
Control Variables	YES	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES	YES
Acq Industry	NO	YES	YES	NO	YES	YES
Tar Industry	NO	NO	YES	NO	NO	YES

Table 6: Premiums paid in slightly accretive stock deals

This table reports the coefficients of OLS regressions of premium paid in each deal (relative to target price one week before announcement). The primary explanatory variable is an indicator for slight accretion (defined as *CH_EPS* in the range from 0 to 0.05). The left panel includes the completed stock deals with $x_1 \leq x_2$ and *CH_EPS* from -0.05 to 0.05. The right panel includes all the completed stock and mixed deals with $x_1 \leq x_2$. The control variables include the acquirer's characteristics reflecting its capital structure and deal characteristics, defined in the appendix. Each variable is winsorized at 1% on both sides. Year dummies indicate the calendar year when the deal is announced. Industry dummies indicate the Fama-French 49 industry of the acquirer and target. t-statistics are reported in parenthesis, using the standard error clustered on year or target industry level (when target industry dummies are controlled for). *, **, and *** indicate statistical significance at 10%, 5%, and 1% level, respectively.

	Premium[-1 Week]					
Sample:	*Stock($x_1 \leq x_2$); Slight Change*			*Stock & Mixed ($x_1 \leq x_2$)*		
D(Slightly Acc.)	-0.082*	-0.067*	-0.046	-0.050**	-0.055	-0.057
	(-1.91)	(-1.91)	(-0.77)	(-2.68)	(-1.22)	(-1.14)
D(Mixed)				0.033	0.032	0.030
				(1.03)	(1.02)	(0.89)
D(Slightly Acc.)*D(Mixed)				0.11*	0.090**	0.086*
				(1.88)	(2.16)	(1.96)
P_CH_EPS	-0.64	-0.88*	-0.85*	-0.19***	-0.20***	-0.18***
	(-0.83)	(-1.87)	(-1.94)	(-4.25)	(-3.40)	(-3.01)
ln(At) Tar	-0.022**	-0.016	-0.020**	-0.0061	-0.0079	-0.0078
	(-2.45)	(-1.13)	(-2.62)	(-0.94)	(-1.15)	(-1.00)
Book Lev. Tar	-0.18*	-0.12	-0.21*	-0.11*	-0.071	-0.100
	(-1.81)	(-1.61)	(-1.82)	(-1.76)	(-1.01)	(-1.32)
MTB Tar	0.014*	0.014	0.0032	0.0072	0.0060	0.0064
	(1.96)	(1.08)	(0.35)	(1.57)	(0.86)	(0.93)
Cash Hold Tar	-0.078	-0.073	-0.14*	-0.050*	-0.031	-0.044
	(-1.30)	(-1.37)	(-1.91)	(-1.86)	(-0.86)	(-1.27)
R&D Tar	-0.055	-0.13	-0.24	0.046	-0.17	-0.18
	(-0.19)	(-0.61)	(-0.80)	(0.28)	(-1.15)	(-1.05)
Tangibility Tar	0.081	0.16	0.052	-0.097**	-0.015	-0.017
	(1.06)	(0.74)	(0.22)	(-2.33)	(-0.12)	(-0.15)
DealValue/MktCapAcq	-0.078	-0.093	-0.084	0.0021	0.014	0.0026
	(-1.24)	(-1.23)	(-0.79)	(0.05)	(0.57)	(0.08)
Same SIC2	-0.12**	-0.11	-0.11*	-0.031	-0.042	-0.029
	(-2.39)	(-1.18)	(-1.87)	(-1.68)	(-1.51)	(-1.08)
Constant	0.64***	0.57***	0.65***	0.44***	0.44***	0.44***
	(8.31)	(4.44)	(5.98)	(9.96)	(7.73)	(7.14)
Year	YES	YES	YES	YES	YES	YES
Acq Ind	NO	YES	YES	NO	YES	YES
Tar Ind	NO	NO	YES	NO	NO	YES
Observations	232	232	232	647	645	644
Adjusted R-squared	0.220	0.238	0.330	0.128	0.132	0.130

Table 7: Target Golden Parachutes and the tendency to pay cash

This table reports the average marginal effects of Logit regressions for the propensity of mixed deals. The explanatory variables include the Golden Parachute of target CEO, its interaction with *P_CH_EPS* and its interaction with an indicator for $x_1>x_2$. The target CEO's Golden Parachute is measured as the amount of total (cash) Golden Parachute scaled by base salary (total compensation) one year before. Control variables include the acquirer's characteristics reflecting its capital structure and deal characteristics such as size ratio of the target and acquirer, defined in the appendix. The sample contains all the completed stock and mixed deals with available Golden Parachute data from 1995 to 2016. An intercept is included but not reported. Year dummies indicate the calendar year when the deal is announced. Industry dummies indicate the One-digit SIC industry of the acquirer and target. Z-statistics are reported in parenthesis, using the standard error clustered on year or acquirer industry level (when acquirer industry dummies are controlled for). *, **, and *** indicate statistical significance at 10%, 5%, and 1% level, respectively.

	Propensity of Mixed Deal r.t. Stock Deal					
Sample:	*Stock & Mixed Deals with Golden Parachute Data*					
	XVAR=					
	GP(Cash)/ Salary	*GP(Cash) /Total*	*GP(Total)/ Total*	*GP(Cash)/ Salary*	*GP(Cash) /Total*	*GP(Total)/ Total*
XVAR	-0.0049	-0.023	-0.0020	0.0018	0.0014	0.011
	(-0.97)	(-0.99)	(-0.62)	(0.25)	(0.03)	(0.88)
P_CH_EPS	-0.11***	-0.37**	-0.36**			
	(-3.24)	(-2.04)	(-2.36)			
***P_CH_EPS**XVAR**	0.015***	0.26*	0.14***			
	(3.23)	(1.77)	(2.73)			
D($x_1>x_2$)				0.093	0.092	0.026
				(1.27)	(1.06)	(0.33)
D($x_1>x_2$)*XVAR				-0.022***	-0.080*	-0.037*
				(-2.83)	(-1.66)	(-1.82)
ln(At) Acq	0.0050	-0.0038	0.0034	0.0045	0.0050	0.0077
	(0.26)	(-0.19)	(0.12)	(0.23)	(0.18)	(0.25)
Book Lev. Acq	-0.065	-0.27	-0.076	-0.082	-0.31	0.032
	(-0.50)	(-1.48)	(-0.21)	(-0.57)	(-1.28)	(0.09)
MTB Acq	0.00015	0.031***	0.041**	0.0033	0.032***	0.032**
	(0.03)	(5.37)	(1.99)	(0.60)	(3.08)	(1.97)
D(Dividend) Acq	-0.040	-0.080	-0.00017	-0.040	-0.093	-0.028
	(-0.68)	(-0.78)	(-0.00)	(-0.71)	(-0.73)	(-0.17)
Cash Hold Acq	0.070	0.33***	0.83***	0.055	0.28*	0.72***
	(0.77)	(2.88)	(3.45)	(0.57)	(1.95)	(3.69)
R&D Acq	-0.30	-0.75	-1.00	-0.30	-0.63	-0.47
	(-1.31)	(-1.37)	(-1.12)	(-1.14)	(-1.07)	(-0.69)
Tangibility Acq	0.038	0.098	0.074	-0.018	0.15	0.29
	(0.17)	(0.31)	(0.21)	(-0.08)	(0.41)	(0.56)
DealValue/MEAcq	-0.052	-0.048	-0.082	-0.013	0.0053	0.038
	(-0.82)	(-0.52)	(-0.75)	(-0.23)	(0.08)	(0.57)
Same SIC2	0.10*	-0.0079	-0.14	0.075	-0.019	-0.14
	(1.92)	(-0.07)	(-1.28)	(1.26)	(-0.21)	(-1.45)
Year	YES	YES	YES	YES	YES	YES
Acq Ind	YES	YES	YES	YES	YES	YES
Tar Ind	YES	YES	YES	YES	YES	YES
Observations	269	166	145	269	166	145
Pseudo R-squared	0.283	0.322	0.292	0.273	0.292	0.251

Table 8: Market reaction and synergies of slightly accretive stock deals

This table reports the coefficients of OLS regressions of acquirer's abnormal market reaction around deal announcement, and deal synergy (measured with the weighted average abnormal return of target and acquirer from 42 trading days before announcement to deal completion following Schwert (1996), Moeller, Schlingemann, Stulz (2005), etc.). The main explanatory variable is an indicator that *CH_EPS* is positive. We control for up to 3rd polynomial terms of *CH_EPS*. Other control variables include the acquirer's characteristics reflecting its capital structure and deal characteristics, defined in the appendix. The sample contains all the completed stock deals with $x_1 \leq x_2$. Each variable is winsorized at 1% on both sides. Year dummies indicate the year when deal is announced. Industry dummies indicate the Fama-French 49 industry of the acquirer and target. t-statistics are reported in parenthesis, using the standard error clustered on year or acquirer industry level (when acquirer fixed effects are controlled for). *, **, and *** indicate statistical significance at 10%, 5%, and 1% level, respectively.

	CAR[-1, +1] Acquirer			**Synergy**			**CAR[-42, C] Acquirer**		
Sample:				*Stock Deals with $x_1 \leq x_2$*					
D(*CH_EPS>0*)	0.017***	0.015***	0.016***	-0.057	-0.064*	-0.065*	-0.049	-0.057**	-0.054*
	(2.98)	(3.78)	(3.38)	(-1.60)	(-2.00)	(-1.78)	(-1.34)	(-2.10)	(-1.86)
CH_EPS	0.0088	0.0086	0.0043	0.29**	0.28**	0.32***	0.33**	0.34***	0.36***
	(0.32)	(0.36)	(0.19)	(2.52)	(2.58)	(2.72)	(2.56)	(3.55)	(3.36)
***CH_EPS*^2**	0.052	0.0083	0.044	0.38	0.26	0.35	0.43	0.25	0.38*
	(0.67)	(0.17)	(0.79)	(1.08)	(1.00)	(1.48)	(1.09)	(0.97)	(1.71)
***CH_EPS*^3**	0.012	0.059	0.035	-0.67**	-0.50**	-0.60***	-0.73**	-0.52**	-0.64***
	(0.14)	(1.02)	(0.48)	(-2.63)	(-2.35)	(-3.36)	(-2.47)	(-2.25)	(-3.21)
ln(At) Acq	0.0014	0.00086	0.00073	0.0016	0.0086	0.0074	0.0065	0.013	0.012
	(0.61)	(0.36)	(0.28)	(0.24)	(0.73)	(0.66)	(0.92)	(1.05)	(1.07)
Book Lev. Acq	0.052*	0.065***	0.065**	0.28*	0.28**	0.25*	0.28*	0.27**	0.23*
	(1.98)	(2.82)	(2.17)	(1.89)	(2.40)	(2.02)	(1.82)	(2.36)	(1.96)
MTB Acq	-0.0027***	-0.0032**	-0.0030**	-0.021**	-0.024***	-0.026***	-0.019*	-0.021***	-0.023***
	(-2.99)	(-2.47)	(-2.11)	(-2.28)	(-4.64)	(-3.85)	(-1.88)	(-3.75)	(-3.49)
D(Dividend) Acq	0.012	0.0077	0.012	0.023	0.015	0.0024	0.021	0.0033	-0.013
	(1.60)	(0.74)	(1.14)	(0.44)	(0.34)	(0.06)	(0.41)	(0.07)	(-0.31)
Cash Hold Acq	0.0047	-0.0088	-0.011	-0.066	-0.041	-0.042	-0.075	-0.051	-0.071
	(0.52)	(-0.75)	(-0.79)	(-1.14)	(-1.10)	(-0.99)	(-1.39)	(-1.05)	(-1.26)
R&D Acq	-0.024	0.060	0.10	0.73	0.62	0.73	0.69	0.63	0.84*
	(-0.43)	(0.76)	(1.34)	(1.70)	(1.48)	(1.34)	(1.38)	(1.56)	(1.84)
Tangibility Acq	0.017	-0.022	-0.062**	0.065	-0.16	-0.078	0.075	-0.20*	-0.14
	(1.28)	(-0.62)	(-2.16)	(0.71)	(-1.55)	(-0.55)	(0.74)	(-1.73)	(-0.85)
DealValue/MktCapAcq	-0.049***	-0.058***	-0.058***	0.0095	0.010	-0.0033	-0.089**	-0.11*	-0.12**

	(-4.30)	(-6.14)	(-5.63)	(0.26)	(0.20)	(-0.08)	(-2.53)	(-1.82)	(-2.29)
Same SIC2	-0.011*	-0.0051	-0.011	-0.052**	-0.030	-0.066**	-0.029	-0.0034	-0.044
	(-1.89)	(-0.65)	(-1.43)	(-2.08)	(-1.64)	(-2.24)	(-1.16)	(-0.15)	(-1.11)
Constant	-0.041**	-0.030	-0.024	0.015	-0.0070	0.038	-0.075	-0.080	-0.027
	(-2.18)	(-1.34)	(-0.93)	(0.23)	(-0.06)	(0.38)	(-1.09)	(-0.65)	(-0.27)
Year	YES	YES	YES	YES	YES	YES	YES	YES	YES
Acq Ind	NO	YES	YES	NO	YES	YES	NO	YES	YES
Tar Ind	NO	NO	YES	NO	NO	YES	NO	NO	YES
Observations	602	599	598	596	593	592	602	599	598
Adjusted R-squared	0.177	0.221	0.239	0.145	0.204	0.212	0.136	0.193	0.207

Table 9: Shareholder voting threshold and payment of cash

The table reports coefficients of OLS regressions. The dependent variable is the proportion of cash in deal payment. The main explanatory variable is an indicator that the pseudo share issuance (implied by pseudo exchange ratio) exceeding 20% of acquirer's shares outstanding. We control for up to 3rd polynomial terms of the gap between pseudo share issuance percent and 20%. Other control variables include target characteristics affecting deal premium, and acquirer characteristics affecting the likelihood for shareholder approval (all defined in the appendix). The sample in the left panel includes all deals (including withdrawn deals). The middle (right) panel contains the deals with *P_CH_EPS*≥0 (*P_CH_EPS*<0). Each variable is winsorized at 1% on both sides. Year dummies indicate the year when deal is announced. Industry dummies indicate the Fama-French 49 industry of the acquirer and target. t-statistics are reported in parenthesis, using the standard error clustered on year or acquirer industry level (when acquirer fixed effects are controlled for). *, **, and *** indicate statistical significance at 10%, 5%, and 1% level, respectively.

	Cash% Payment								
Sample:	*All Deals*			*P_CH_EPS≥0*			*P_CH_EPS<0*		
D[PS. Share Issue>20%]	0.072*	0.088**	0.082	0.083	0.067	0.059	0.061	0.094**	0.079*
	(1.78)	(2.08)	(1.40)	(1.51)	(0.77)	(0.61)	(1.06)	(2.31)	(1.71)
PS. Share Issue %-20%	-0.27	-0.34	-0.29	-0.26	-0.25	-0.19	-0.18	-0.34	-0.24
	(-1.40)	(-1.41)	(-0.87)	(-0.87)	(-0.65)	(-0.43)	(-0.80)	(-1.53)	(-0.74)
(PS. Share Issue %-20%)^2	-0.0043	0.059	-0.011	-0.065	0.043	-0.053	-0.16	-0.012	-0.17
	(-0.01)	(0.14)	(-0.02)	(-0.12)	(0.06)	(-0.06)	(-0.43)	(-0.03)	(-0.30)
(PS. Share Issue%-20%)^3	0.17	0.15	0.17	0.19	0.11	0.14	0.27	0.20	0.25
	(0.87)	(0.61)	(0.47)	(0.56)	(0.26)	(0.25)	(1.15)	(0.80)	(0.78)
ln(At) Tar	-0.096***	-0.077***	-0.078***	-0.077***	-0.080***	-0.074***	-0.11***	-0.072***	-0.077**
	(-6.09)	(-4.10)	(-3.32)	(-2.95)	(-3.45)	(-3.13)	(-6.09)	(-3.32)	(-2.53)
Book Lev. Tar	0.026	0.047	0.071	0.096	0.11	0.13	-0.031	-0.022	0.014
	(0.51)	(0.51)	(0.83)	(1.51)	(1.16)	(1.46)	(-0.36)	(-0.23)	(0.12)
MTB Tar	-0.010***	-0.015***	-0.015***	-0.014***	-0.015***	-0.016***	-0.0094**	-0.015***	-0.015***
	(-3.00)	(-5.39)	(-5.75)	(-4.24)	(-2.80)	(-3.56)	(-2.17)	(-4.08)	(-3.97)
Cash Hold Tar	-0.011	-0.012	-0.010	-0.00029	-0.0036	0.0090	-0.011	-0.012	-0.016
	(-0.69)	(-0.76)	(-0.69)	(-0.02)	(-0.14)	(0.36)	(-0.44)	(-0.47)	(-0.63)
R&D Tar	0.13*	-0.042	-0.089	-0.0035	0.066	-0.096	0.13	-0.15	-0.15
	(1.75)	(-0.47)	(-0.84)	(-0.02)	(0.62)	(-0.94)	(1.59)	(-1.64)	(-1.04)
Tangibility Tar	0.11	0.051	0.016	-0.063	-0.16	-0.059	0.23***	0.19*	0.10
	(1.30)	(0.52)	(0.17)	(-0.46)	(-1.33)	(-0.57)	(3.22)	(1.82)	(0.84)
Same SIC2	-0.091***	-0.0067	-0.016	-0.052**	0.00089	0.0028	-0.12***	-0.015	-0.027
	(-4.13)	(-0.33)	(-0.77)	(-2.49)	(0.03)	(0.12)	(-3.51)	(-0.54)	(-1.02)

ln(At) Acq	0.078***	0.076***	0.078***	0.059**	0.067***	0.064***	0.088***	0.073***	0.079***
	(4.96)	(7.31)	(5.72)	(2.09)	(4.40)	(4.09)	(5.52)	(5.53)	(4.21)
Book Lev. Acq	-0.054	-0.040	-0.013	-0.11	-0.11	-0.055	-0.034	0.039	0.073
	(-0.65)	(-0.75)	(-0.20)	(-0.98)	(-1.18)	(-0.52)	(-0.33)	(0.47)	(0.85)
MTB Acq	0.0017	-0.0026	-0.0023	0.00039	0.00029	-0.000020	0.0024	-0.0040	-0.0028
	(0.85)	(-1.19)	(-0.97)	(0.11)	(0.10)	(-0.01)	(0.91)	(-1.54)	(-0.91)
D(Dividend) Acq	-0.029	0.047**	0.042**	-0.018	-0.022	-0.022	-0.045	0.071**	0.059**
	(-1.10)	(2.07)	(2.26)	(-0.50)	(-0.75)	(-0.52)	(-1.44)	(2.08)	(2.13)
Cash Hold Acq	-0.023**	-0.0081	-0.0096	-0.028**	-0.022**	-0.018	-0.020	-0.0091	-0.010
	(-2.44)	(-0.65)	(-0.78)	(-2.49)	(-2.16)	(-0.89)	(-1.27)	(-0.41)	(-0.80)
R&D Acq	-0.14	-0.30**	-0.29***	-0.091	-0.035	-0.054	-0.13	-0.38***	-0.35***
	(-1.24)	(-2.68)	(-2.87)	(-0.69)	(-0.33)	(-0.45)	(-0.88)	(-3.17)	(-2.98)
Tangibility Acq	0.12	0.022	0.041	0.13	0.25	0.31**	0.11	-0.11	-0.098
	(1.43)	(0.22)	(0.37)	(0.94)	(1.49)	(2.11)	(1.39)	(-1.08)	(-0.78)
Constant	0.43***	0.28***	0.29**	0.38***	0.28**	0.24	0.47***	0.33***	0.34***
	(7.20)	(2.91)	(2.43)	(4.67)	(2.29)	(1.57)	(6.74)	(3.48)	(2.71)
Year	YES	YES	YES	YES	YES	YES	YES	YES	YES
Acq Ind	NO	YES	YES	NO	YES	YES	NO	YES	YES
Tar Ind	NO	NO	YES	NO	NO	YES	NO	NO	YES
Observations	2330	2316	2313	858	852	852	1471	1463	1460
Adjusted R-squared	0.248	0.332	0.339	0.199	0.272	0.286	0.267	0.388	0.392

Table 10: Deal completion and EPS dilution

Panel A reports the number and faction of completed and withdrawn deals among the stock deals in our sample. Accretive (Dilutive) deals are defined as the ones with *CH_EPS*≥0 (*CH_EPS* < 0). Deeply dilutive deals are defined as those with *CH_EPS* in the bottom quartile of *CH_EPS*. Panel B reports the coefficients of a linear probability model for deal completion. The main explanatory variable is an indicator for EPS dilution. We control for up to 3rd polynomial terms of *CH_EPS*. Other control variables include target characteristics affecting deal premium, and acquirer characteristics affecting the tendency for shareholder approval, all defined in the appendix. The sample of the left panel includes all the stock deals (including the withdrawn deals). The middle (right) panel contains the stock deals with share issuance (implied by the exchange ratio) exceeding (below) 20% of acquirer's shares outstanding. Each variable is winsorized at 1% on both sides. Year dummies indicate the year when deal is announced. Industry dummies indicate the Fama-French 49 industry of the acquirer and target. t-statistics are reported in parenthesis, using the standard error clustered on year or acquirer industry level (when acquirer industry fixed effects are controlled for). *, **, and *** indicate statistical significance at 10%, 5%, and 1% level, respectively.

Panel A:

	Accretive	**Dilutive**	**Other**	**Deeply Dilutive**	**Total Stock**
Withdrawn	66	94	100	60	160
	[9.61%]	[11.66%]	[8.94%]	[16.04%]	[10.72%]
Completed	621	712	1019	314	1333
	[90.39%]	[88.34%]	[91.06%]	[83.96%]	[89.28%]
Total	687	806	1119	374	1493

Panel B:

	Probability of Deal Completion								
Sample:	*All Stock Deals*			*Stock (Share Issue<20%)*			*Stock (Share Issue>20%)*		
D(*CH_EPS*<0)	-0.037*	-0.046*	-0.052**	-0.017	-0.026	-0.015	-0.061**	-0.064*	-0.072**
	(-1.83)	(-1.75)	(-2.22)	(-0.61)	(-0.88)	(-0.56)	(-2.45)	(-1.74)	(-2.21)
CH_EPS	-0.016	-0.025	-0.040	-0.029	0.0051	0.087	-0.020	-0.024	-0.038
	(-0.39)	(-0.64)	(-1.09)	(-0.48)	(0.05)	(0.80)	(-0.48)	(-0.56)	(-0.90)
***CH_EPS*^2**	-0.011	-0.011	-0.015	-0.0021	0.017	0.046	-0.013	-0.0100	-0.015
	(-0.88)	(-1.13)	(-1.41)	(-0.18)	(0.38)	(1.02)	(-1.06)	(-0.87)	(-1.27)
***CH_EPS*^3**	0.00055	0.00067	0.0012	0.00083	-0.0011	-0.0041	0.00073	0.00052	0.00099
	(0.40)	(0.54)	(0.90)	(0.48)	(-0.24)	(-0.93)	(0.51)	(0.36)	(0.64)
***CH_EPS*^4**	0.00018	0.00018	0.00026	0.00011	-0.00031	-0.00093	0.00022	0.00014	0.00025
	(0.70)	(0.86)	(1.17)	(0.43)	(-0.33)	(-0.98)	(0.84)	(0.58)	(0.94)
ln(At) Tar	-0.031***	-0.031***	-0.029***	-0.020*	-0.021*	-0.023	-0.050***	-0.059**	-0.051***
	(-3.74)	(-3.20)	(-3.94)	(-1.92)	(-1.78)	(-1.64)	(-2.99)	(-2.37)	(-2.87)

Book Lev. Tar	-0.0056	0.0095	0.0010	0.039	-0.0053	-0.0010	-0.027	0.025	0.0044
	(-0.09)	(0.14)	(0.02)	(0.45)	(-0.08)	(-0.01)	(-0.26)	(0.20)	(0.06)
MTB Tar	-0.0093*	-0.0076**	-0.0064	-0.010**	-0.0042	-0.0027	-0.0094	-0.0088	-0.0083
	(-1.84)	(-2.11)	(-1.37)	(-2.10)	(-0.82)	(-0.34)	(-1.66)	(-1.54)	(-1.32)
Cash Hold Tar	0.0083	0.0030	0.0040	-0.045*	-0.045**	-0.026	0.028**	0.021**	0.015
	(1.16)	(0.39)	(0.29)	(-2.05)	(-2.24)	(-0.80)	(2.74)	(2.45)	(1.24)
R&D Tar	0.11	0.21***	0.23**	0.25**	0.30**	0.26	-0.019	0.093	0.16**
	(1.04)	(5.32)	(2.29)	(2.16)	(2.41)	(1.27)	(-0.12)	(1.12)	(2.48)
Tangibility Tar	0.068	0.042	0.031	-0.079	-0.051	-0.016	0.21*	0.15	0.17
	(0.67)	(0.39)	(0.40)	(-0.45)	(-0.33)	(-0.08)	(1.78)	(1.11)	(1.34)
Same SIC2	0.034	0.0098	0.024	0.025	-0.0014	0.024	0.046	0.019	0.020
	(1.62)	(0.39)	(0.83)	(1.23)	(-0.05)	(0.70)	(1.53)	(0.57)	(0.44)
ln(At) Acq	0.049***	0.042***	0.041***	0.052***	0.050***	0.051***	0.062***	0.062***	0.055***
	(8.47)	(5.10)	(6.17)	(4.67)	(3.41)	(2.94)	(4.66)	(3.22)	(2.95)
Book Lev. Acq	-0.082	-0.027	0.016	-0.082	-0.0020	0.049	-0.055	-0.038	-0.0047
	(-1.35)	(-0.29)	(0.23)	(-0.80)	(-0.02)	(0.49)	(-0.63)	(-0.28)	(-0.04)
MTB Acq	0.0041***	0.0039**	0.0033*	0.0042**	0.0022	0.000028	0.0058***	0.0062*	0.0065
	(2.86)	(2.31)	(1.83)	(2.30)	(1.09)	(0.01)	(2.82)	(1.82)	(1.55)
D(Dividend) Acq	-0.022	-0.037	-0.033	-0.049	-0.082*	-0.074	0.0030	-0.0074	-0.0074
	(-0.94)	(-0.97)	(-1.07)	(-1.57)	(-1.91)	(-1.54)	(0.10)	(-0.13)	(-0.13)
Cash Hold Acq	0.015	0.0082	0.0067	0.038***	0.033***	0.034**	0.0039	-0.0031	-0.0057
	(1.33)	(0.93)	(0.47)	(5.96)	(3.40)	(2.32)	(0.19)	(-0.26)	(-0.33)
R&D Acq	-0.0035	0.075	0.077	-0.052	0.014	0.028	0.043	0.13	0.12
	(-0.04)	(0.94)	(1.37)	(-0.60)	(0.16)	(0.33)	(0.31)	(0.66)	(0.81)
Tangibility Acq	-0.12	-0.016	-0.027	0.021	0.17	0.14	-0.27**	-0.11	-0.16
	(-1.34)	(-0.21)	(-0.32)	(0.16)	(1.12)	(0.93)	(-2.28)	(-0.69)	(-1.04)
Constant	0.74***	0.79***	0.77***	0.65***	0.68***	0.64***	0.77***	0.81***	0.81***
	(22.16)	(14.13)	(16.62)	(7.92)	(6.45)	(6.45)	(13.48)	(12.22)	(12.14)
Year	YES	YES	YES	YES	YES	YES	YES	YES	YES
Acq Ind	NO	YES	YES	NO	YES	YES	NO	YES	YES
Tar Ind	NO	NO	YES	NO	NO	YES	NO	NO	YES
Observations	1235	1226	1225	513	510	510	722	716	715
Adjusted R-squared	0.076	0.121	0.132	0.112	0.165	0.194	0.074	0.120	0.114

Table 11: Propensity of (slightly) accretive deals and institutional investors' churn rate

This table reports the average marginal effects of Logit regressions for the propensity of (slightly) accretive deals. The left panel contains the stock deals with $x_1 \leq x_2$ and *CH_EPS* between -0.05 to 0.05. The middle panel uses the sample of stock deals with $x_1 \leq x_2$. The right panel uses the sample of all completed stock deals. The primary explanatory variable is the weighted average churn rate of the acquirer's institutional investors two quarters before the deal announcement. Control variables include the acquirer's characteristics reflecting its capital structure and deal characteristics such as size ratio of the target and acquirer, defined in the appendix. Each variable is winsorized at 1% on both sides. An intercept is included but not reported. Year dummies indicate the calendar year when the deal is announced. Industry dummies indicate the one-digit SIC for the left three columns and the Fama-French 49 industry for the other six columns. Z-statistics are reported in parenthesis, using the standard error clustered on year or acquirer industry level (when acquirer industry dummies are controlled for). *, **, and *** indicate statistical significance at 10%, 5%, and 1% level, respectively.

	Slight Accretive			**Accretive**			**Accretive**		
Sample:	*Stock($x_1 \leq x_2$; Small Ch_EPS)*			*Stock($x_1 \leq x_2$)*			*Completed Stock*		
Churn Rate(Acq)	1.28	1.66**	1.74**	1.53**	1.47***	1.50***	1.29**	1.29***	1.26***
	(1.25)	(2.48)	(2.55)	(2.34)	(2.89)	(3.14)	(2.09)	(2.75)	(2.79)
Inst. Own(Acq)	-0.17	-0.15	-0.15*	0.013	-0.053	0.014	0.0020	-0.089	-0.068
	(-0.93)	(-1.63)	(-1.65)	(0.13)	(-0.73)	(0.26)	(0.04)	(-1.32)	(-1.24)
ln(At) Acq	-0.011	-0.0053	-0.0097	0.0048	0.011	0.010	0.026***	0.038***	0.036***
	(-0.91)	(-0.26)	(-0.49)	(0.44)	(1.28)	(1.44)	(3.23)	(4.62)	(4.47)
Book Lev. Acq	-0.017	-0.14	-0.16	-0.12	-0.032	-0.15	-0.15*	-0.074	-0.084
	(-0.06)	(-0.46)	(-0.52)	(-1.13)	(-0.25)	(-1.53)	(-1.81)	(-0.58)	(-0.58)
MTB Acq	0.0038	0.0039	0.0043	0.0025	0.0059	0.013*	-0.0032	-0.0043*	-0.0043
	(0.70)	(1.31)	(1.10)	(0.49)	(0.65)	(1.76)	(-1.15)	(-1.67)	(-1.60)
D(Dividend) Acq	-0.096	-0.067	-0.048	-0.11***	-0.11	-0.089	-0.065	-0.034	-0.039
	(-1.30)	(-0.38)	(-0.32)	(-2.93)	(-1.08)	(-0.87)	(-1.63)	(-0.56)	(-0.61)
Cash Hold Acq	0.0012	-0.018	0.0039	0.018	-0.0036	0.012	-0.0056	-0.011	-0.012
	(0.01)	(-0.11)	(0.02)	(0.31)	(-0.05)	(0.14)	(-0.36)	(-0.76)	(-0.71)
R&D Acq	-0.080	-0.17	-0.19	-0.21	-0.0042	-0.32	-0.095	-0.11	-0.081
	(-0.12)	(-0.21)	(-0.25)	(-0.41)	(-0.00)	(-0.30)	(-0.82)	(-0.64)	(-0.43)
Tangibility Acq	0.20	0.49	0.24	0.19*	0.030	-0.45	0.044	-0.034	-0.061
	(1.59)	(0.86)	(0.47)	(1.92)	(0.08)	(-1.10)	(0.57)	(-0.18)	(-0.29)
DealValue/MktCapAcq	-0.19	-0.16	-0.19	-0.011	-0.010	-0.026	0.17***	0.18***	0.18***
	(-1.25)	(-1.19)	(-1.30)	(-0.17)	(-0.29)	(-0.90)	(2.59)	(5.52)	(5.70)
Same SIC2	0.063	0.072	0.058	-0.049	-0.00061	0.035	-0.050	-0.021	0.0029
	(0.93)	(0.82)	(0.85)	(-1.20)	(-0.01)	(0.60)	(-1.59)	(-0.59)	(0.10)

Year	YES	YES	YES	YES	YES	YES	YES	YES	YES
Acq Industry	NO	YES	YES	NO	YES	YES	NO	YES	YES
Tar Industry	NO	NO	YES	NO	NO	YES	NO	NO	YES
Observations	254	253	253	631	571	535	1253	1230	1216
Pseudo R-squared	0.118	0.136	0.160	0.104	0.110	0.144	0.065	0.090	0.109

Table 12: EPS-sensitivity and CEO compensation based on EPS

The left panel reports the average marginal effects of Logit regressions for the propensity of cash deals. The sample contains all the merger deals announced from 2006 to 2016 in our sample with the acquirer firm covered by Incentive Lab. The right panel reports the average marginal effects of Logit regressions for EPS accretion. The sample contains the stock and mixed deals with the acquirer covered by Incentive Lab. The primary explanatory variables are the value of unvested compensation (including cash and equity incentive plans) using EPS (or total Earnings) as one of the vesting hurdles at the deal announcement for the acquirers' CEOs. The amount of unvested compensation is scaled by three-year-average salary to gauge its relative importance. Control variables include the acquirer's characteristics reflecting its capital structure and deal characteristics such as size ratio of the target and acquirer, defined in the appendix. Each variable is winsorized at 1% on both sides. Year dummies indicate the calendar year when the deal is announced. Industry dummies indicate the one-digit SIC industry of the acquirer and target. An intercept is included but not reported. Z-statistics are reported in parenthesis, using the standard error clustered on year or acquirer industry level (when acquirer industry dummies are controlled for). *, **, and *** indicate statistical significance at 10%, 5%, and 1% level, respectively.

	Prob. Cash Deals				**Prob. Accretive Deals**			
Sample:	*Completed Deals (2007-2017)*				*Completed Stock & Mixed (2007-2017)*			
Unvest [EPS]/Salary(3yr)	0.011***	0.0094**	0.0017**	0.00044	0.028***	0.032***	0.027**	0.021**
	(2.66)	(2.37)	(1.99)	(0.32)	(3.01)	(4.43)	(2.14)	(1.97)
Unvest [Earning]/Salary(3yr)	0.0053	-0.00014	-0.00096	-0.0022	0.0038	0.0083	0.0040	0.0077
	(1.11)	(-0.04)	(-0.33)	(-0.77)	(0.23)	(0.64)	(0.27)	(0.39)
ln(At) Acq		-0.038*	-0.0082	-0.0076		-0.048	-0.044	-0.034
		(-1.80)	(-1.02)	(-1.18)		(-1.05)	(-1.24)	(-1.08)
Book Lev. Acq		-0.027	-0.035	-0.043		-0.011	0.018	-0.0024
		(-0.12)	(-0.18)	(-0.27)		(-0.04)	(0.08)	(-0.01)
MTB Acq		-0.0097**	-0.011***	-0.013***		-0.0065	-0.0087	-0.0082
		(-2.30)	(-6.57)	(-10.37)		(-0.64)	(-0.63)	(-0.59)
D(Dividend) Acq		-0.030	-0.027	-0.0024		-0.049	-0.044	0.0071
		(-0.58)	(-0.44)	(-0.05)		(-0.41)	(-0.48)	(0.07)
Cash Hold Acq		0.20	0.11	0.041		0.35	0.36	0.73**
		(1.12)	(0.57)	(0.20)		(0.55)	(1.10)	(2.45)
R&D Acq		1.30**	-0.22	-0.047		-0.29	-0.65	-1.17
		(2.10)	(-0.53)	(-0.10)		(-0.20)	(-0.61)	(-0.87)
Tangibility Acq		0.21	-0.012	-0.029		0.045	-0.038	0.45
		(1.34)	(-0.13)	(-0.52)		(0.18)	(-0.10)	(0.97)
DealValue/MktCapAcq		-0.88***	-0.73***	-0.72***		0.17	0.066	0.15
		(-12.76)	(-12.35)	(-11.67)		(0.83)	(0.34)	(0.54)

Same SIC2		0.020	0.022	0.0056		-0.073	-0.016	0.035
		(0.49)	(0.32)	(0.24)		(-0.86)	(-0.18)	(0.38)
Year	NO	YES	YES	YES	NO	YES	YES	YES
Acq Ind	NO	NO	YES	YES	NO	NO	YES	YES
Tar Ind	NO	NO	NO	YES	NO	NO	NO	YES
Observations	391	380	380	380	143	135	134	134
Pseudo R-squared	0.015	0.317	0.448	0.498	0.035	0.152	0.185	0.249

Appendix A: Variable Definitions

Variables	Definition
Cash Deals	A merger or acquisition deal where the target firm's common shareholders receive only cash from the acquirer.
Stock Deals	A merger or acquisition deal where the target firm's common shareholders receive only common stocks from the acquirer.
Mixed Deals	A merger or acquisition deal where the target firm's common shareholders receive a combination of cash and stock from the acquirer.
Cash%	Proportion of cash in deal payment. It equals to 1 for pure stock deal, to 0 for pure cash deal, and is between 0 and 1 for mixed deals.
x_1(or $\frac{p_t}{p_b}$)	The ratio of target and acquirer stock price one day before deal announcement.
x_2(or $\frac{e_t}{e_b}$)	The ratio of target and acquirer most recent annual forecasted EPS (median value, from I/B/E/S) before deal announcement. When the EPS forecast is missing, it is filled up with the "last-twelve-month EPS" from SDC. When either acquirer or target has negative EPS, x_2 is set as missing.
x	Exchange Ratio, the number of shares of the combined company per legacy target share in a stock and mixed deal.
x_{ps}	Pseudo Exchange Ratio, the exchange ratio if a cash or mixed deal were paid entirely in stock. It is measured as the "offer price per share" (paid to per target common shareholders) divided by the acquirer's stock price one day before deal announcement. For a pure stock deal, the pseudo exchange ratio is the same as the exchange ratio.
$e_{combine}$	Combined EPS, calculated using pseudo exchange ratio. $e_{combine} = \frac{e_t \cdot n + e_b \cdot m}{n \cdot x_{ps} + m}$.
P_CH_EPS	Pseudo change in EPS, the combined EPS (calculated using pseudo exchange ratio) minus acquirer's EPS. $P\_CH\_EPS = \frac{e_t \cdot n + e_b \cdot m}{n \cdot x_{ps} + m} - e_b$.
CH_EPS	Change in EPS, the combined EPS calculated using (actual) exchange ratio minus acquirer's EPS. $CH\_EPS = \frac{e_t \cdot n + e_b \cdot m}{n \cdot x + m} - e_b$.
E(R)	The acquirer's borrowing cost or opportunity cost of forgoing excess cash. If the acquirer is holding excess cash, we assume the opportunity cost of not holding cash is the 3-month treasury-bill rate at deal announcement. If the excess cash does not cover all the deal value, we assume the uncovered component is financed with debt at the implied interest rate of the acquirer, which is estimated using total interest expenses scaled by lagged total debt. When the acquirer has missing value on the implied interest rate, we fill it up with the median value of firms in the same (Fama-French 49) industry and size quintile. The excess cash holding is defined as the residual term of OLS regression of cash holding on firm characteristics controlling for the industry and year fixed effects following the specification in Pinkowitz, Stulz, and Williamson (2015).
Slightly (pseudo) Accretive	An indicator for deals with (pseudo) change in EPS above zero but below 0.05.

Slightly (pseudo) Dilutive	An indicator for deals with (pseudo) change in EPS below zero but above -0.05.
PS. Share Issue	The pseudo share issuance associated with a deal (calculated using the pseudo exchange ratio, equals to $n \cdot x_{ps}$) as percentage of the acquirer's outstanding shares before deal announcement.
Share Issue	The expected share issuance associated with the deal (calculated using the exchange ratio, equals to $n \cdot x$) as percentage of the acquirer's outstanding shares before deal announcement.
Deeply Dilutive	An indicator for the deals with *CH_EPS* in the bottom quartile of *CH_EPS* among all the pure stock deals. (Table 10)
Ln(AT)	The natural logarithm of total assets.
Book Lev.	The book leverage ratio, the sum of short-term and long-term liability scaled by lagged total assets.
MTB	The market to book ratio of equity.
D(Dividend)	A dummy indicating paying dividend.
Cash Hold	Cash and equivalents scaled by lagged total assets.
R&D	The R&D expenditure scaled by lagged total assets.
Tangibility	The PPENT scaled by lagged total assets.
Deal Value/ MktCap	The ratio of deal transaction value and the market capitalization of the acquirer before announcement.
Same SIC2	An indicator that the acquirer and target are in the same two-digit-SIC industry.
Tender Offer	An indicator for tender offer deals.
Churn rate	The weighted average churn rate of institutional investors, weighted by institution's ownership in each firm.
Inst. Own	Percentage of shares owned by institutional investors.
Premium[1week]	The percentage premium of the "offer price per share" of the deal relative to the target's stock price one week before deal announcement.
CAR[-1,+1]	The cumulative abnormal return of acquirer during the three-day event window (one day before to one day after deal announcement). We use the CRSP value-weighted index as the market portfolio to estimate the parameters of market model using daily stock returns from 253 trading days to 42 trading days before deal announcement. Then we use the estimated parameters to compute the expected return during the event window. The daily pricing errors (realized return minus the expected return) are cumulated over the event window.
Synergy	The average cumulative abnormal returns of acquirer and target during the bid period (42 trading days before announcement to deal completion) weighted by the market capitalizations of them 43 trading days before announcement (following Schwert (1996), Moeller, Schlingemann, Stulz (2005), etc.).

CAR[-42,C]	The cumulative abnormal return of acquirer from 42 trading days before announcement to deal completion.
GP(Cash)/ Salary	The ratio of cash component of Golden Parachute (severance) payment received by the target CEO over his or her base salary of the previous fiscal year.
GP(Cash)/ Total	The ratio of cash component of Golden Parachute (severance) payment received by the target CEO over his or her total compensation (TDC1 from ExecuComp) of the previous fiscal year.
GP(total)/ Total	The ratio of total Golden Parachute payment (including severance, accelerated equity compensation, and other perks) received by the target CEO over his or her total compensation (TDC1 from ExecuComp) of the previous fiscal year.
Unvest [EPS]/ Salary(3yr)	The total value of unvested incentive plans of the acquirer's CEO at the time of deal announcement that include EPS as one of the performance metrics, divided by his or her average salary over the past 3 years.
Unvest [Earnings] / Salary(3yr)	The total value of unvested incentive plans of the acquirer's CEO at the time of deal announcement that include total earnings (EBIT, EBITDA, etc.) as one of the performance metrics, divided by his or her average salary over the past 3 years.

Appendix B: Discontinuity Test

We use two methods to test whether the distribution of a running variable is discontinuous at certain threshold.

The first method is the test proposed by Cattaneo, Jansson, and Ma (2019), which first estimates the density functions of a running variable from both sides of a (pre-specified) threshold using the local-polynomial technic. We control for up to the 3rd order polynomial terms and choose the optimal bandwidths based on asymptotic mean squared minimization. Different bandwidths on two sides of the threshold are allowed for. Then we test whether the point estimations of the left and right density at the threshold is significantly different from each other. Cattaneo, Jansson, and Ma (2019) provides a robust bias-correction approach, which removes the boundary bias by using a higher-order polynomial in the estimation of the densities and adjusting standard errors accordingly. In each figure of this test, we plot the fitted density functions within the range of bandwidths around threshold. The 95% confidence interval of density is indicated by a shadow area. The bandwidths and the robust p-value is reported in the subtitle of the figure. This test is conducted by using the stata command of *rddensity*. This test is in the same vein of McCary Test (McCary (2008)). Our results are all robust to using McCary test.

The second test assumes a smooth underlying distribution, and tests whether the observed data rejects the null hypothesis that no discontinuity exists. To conduct this test, we first group the running variable into fine bins. We choose the optimal bin size considering the dispersion of the distribution and sample size following Bollen and Pool (2009). We next estimate a smooth density function using Gaussian kernel. Last, we integrate the kernel density along the boundary of each bin to compute the probability that an observation will reside in it. Let p denote this probability and N the total number of observations in a sample. The DeMoivre-Laplace theorem states that the actual number of observations that will reside in the bin is asymptotically normally distributed with mean Np and standard deviation $\sqrt{Np(1-p)}$. We construct a test variable $(K-Np)/\sqrt{Np(1-p)}$, where K is the actual number of observations in each bin. We plot the test variable with respect to (the lower bound of) each bin and use dashed lines to mark the 95% confidence interval. This test would indicate any point where the observed distribution rejects the smooth distribution assumption.

Figure B1: The EPS implications of the mixed deals with pseudo change in EPS around zero

This shows the mean of *CH_EPS* (calculated with the exchange ratio) in each bin of *P_CH_EPS* (calculated with the pseudo exchange ratio). We focus on the sample of mixed deals with pseudo change in EPS from -0.42 to +0.42. Observations are grouped into evenly spaced bins with bin size of 0.7 (corresponding to Figure 4(b)). The lines are fitted polynomial functions from both sides of zero of *P_CH_EPS* based on the mean values of each bin.

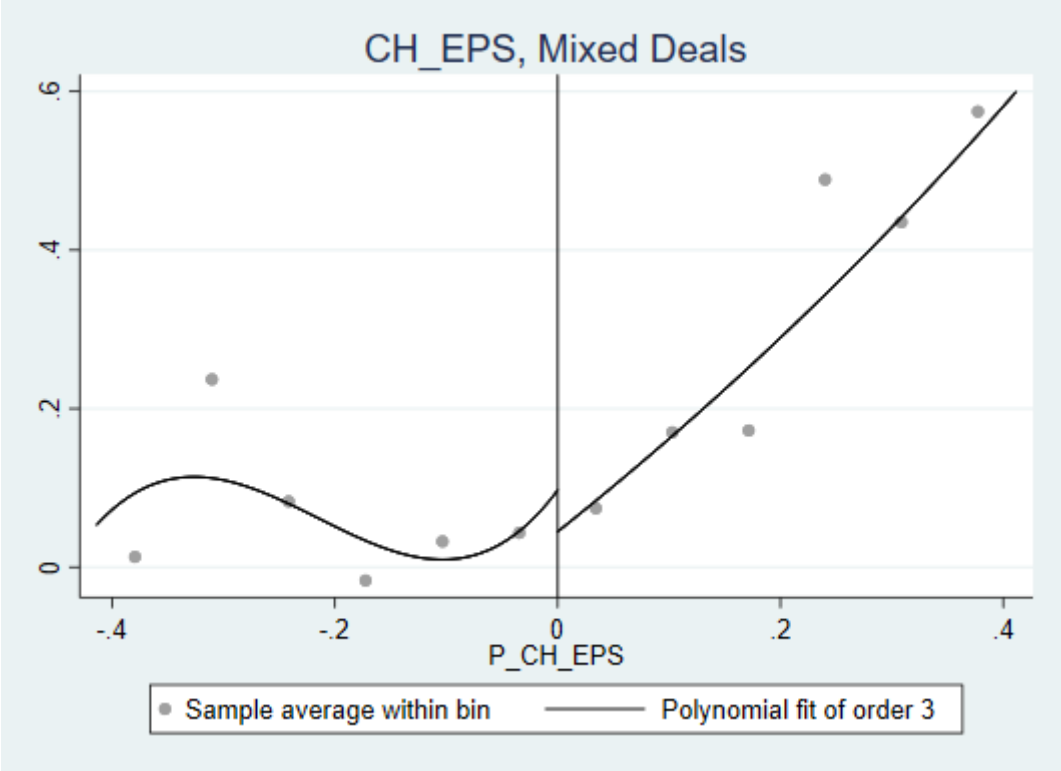


Table B1 Estimated density discontinuity around zero of *P_CH_EPS* in simulated samples

Panel A shows the estimated densities from Figure 3(a) in the sample of cash deals. Panel B reports the proportion of three types of deals in each subsample. In Panel C, we report the results of two simulation analyses. In simulation I, we randomly assign deal types in the full sample using the probability of deal types in the subsample of pseudo-accretive deals (the second row in Panel B). In simulation II, we randomly assign deal types in two sub-periods using the probability of each types of deals in that sub-period (the last two rows in Panel B). In each of the 1000 simulated samples of cash deals, we estimate the (local-polynomial) density functions of *P_CH_EPS* from both sides of zero as in Figure 3(a), and measure the difference between the densities to the right and left of zero. We report the distribution of the estimated difference in densities around zero in 1000 simulated cash-deal samples.

Panel A:

Bias-corrected density estimate to the left of zero:	6.8102
Bias-corrected density estimate to the right of zero:	2.8715
Difference between right and left density estimates:	-3.9387

Panel B:

		Fraction of Deals		
		Cash	Mixed	Stock
Actual	**Overall**	31.06%	13.51%	55.44%
	***P_CH_EPS*>0**	22.39%	11.41%	66.20%
	***P_CH_EPS*<0**	38.73%	14.21%	47.06%
	1991-2001	20.87%	6.98%	72.15%
	2002-2017	45.40%	22.70%	31.89%

Panel C:

	Cash%	**Matching**	**Distribution of the Difference between right and left density estimates in the simulated cash samples**												
			N.Simu	**0.5**	**p1**	**2.5**	**p5**	**p10**	**p50**	**p90**	**p95**	**97.5**	**p99**	**99.5**	**mean**	**sd.**
Simu. I.	22.39%	P_CH_EPS>0	1000	-3.39	-3.20	-2.85	-2.48	-2.18	-1.16	-0.02	0.32	0.60	0.87	1.01	-1.12	0.86
Simu. II.	31.06%	2 Sub-periods	1000	-3.63	-3.39	-3.14	-2.92	-2.70	-1.88	-0.96	-0.61	-0.41	-0.15	-0.09	-1.85	0.69