Excess corporate payouts and financial distress risk

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Abstract

Firms that follow excessive payout policies (over-payers) are higher on the financial distress spectrum and have lower survival rates than under-payers. In addition, over-payers endure lower future sales and asset growth than under-payers and experience negative abnormal returns in the bond and stock markets. Exogenous import tariff reductions and commodity price jumps reduce the likelihood of overpayment. We interpret this as evidence consistent with financial flexibility considerations, rather than risk-shifting, explaining the decision to overpay. We also find that CEO overconfidence and catering incentives affect overpayment.

Keywords: payout policy, financial distress, firm survival, over-payers, financial flexibility.

JEL Classifications: G32, G33, G35.

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"It concerns us that, in the wake of the financial crisis, many companies have shied away from investing in the future growth of their companies….Too many companies have cut capital expenditure and even increased debt to boost dividends and increase share buybacks.…We certainly believe that returning cash to shareholders should be part of a balanced capital strategy; however, when done for the wrong reasons and at the expense of capital investment, it can jeopardize a company's ability to generate sustainable long-term returns." (*Larry Fink, CEO of BlackRock. Open letter to shareholders, Reuters and Wall Street Journal, March 26, 2014).*

1. Introduction

Record payouts, which reached an all-time high of $1.37tn in 2018, have fueled extensive debate in the financial press[1] over current corporate payout policies. They also featured prominently in the 2016 US presidential race, when the Democratic nominee's economic plan focused on excessive corporate buybacks and their impact on long-term investment.[2] The overarching concern in this debate is that high payouts drain firms of important resources, reducing investment, and leading to greater risk and instability in listed firms, which propagates to the financial markets. In the currently unfolding economic crisis caused by the Covid-19 pandemic, this concern appears to have been the major driver behind regulators' and central banks' decisions to limit corporate payouts especially for firms receiving state-backed bailouts.[3]

[1] See for example "Global dividends hit new record." – Beioley, FT (February 22, 2019); "The amount of cash corporate America is dishing to investors sends a scary signal about the stock market's future" – Udland, Business Insider US (July 1, 2016).

[2] See www.hillaryclinton.com/briefing/factsheets/2015/07/24/encourage-long-term-growth/ (accessed December 16, 2016).

[3] See for example "UK bailout scheme companies barred from paying bonuses and dividends" – Thomas and Pickard, FT (May 19, 2020); also see https://www.bankofengland.co.uk/prudential-regulation/publication/2020/pra-statement-on-deposit-takers-approach-to-dividend-payments-share-buybacks-and-cash-bonuses (accessed July 22, 2020).

In this paper we argue that, in order to better understand the relation between large payouts and firm risk, in particular financial distress risk, the focus should be on excessive payout policies. It is overpayment[4] that could lead to a significant reduction in liquid assets and retained earnings, which reduces financial flexibility and increases distress risk (the *reduced-flexibility hypothesis*). At the same time, it is well established in the literature that firms with high levels of debt and facing significant financial distress risk have an incentive to transfer wealth from creditors to shareholders through major, frequently excessive, payouts (the *risk-shifting hypothesis*) (e.g., Acharya, Le, & Shin, 2017; Black, 1976; Smith & Warner, 1979). These two hypotheses are not mutually exclusive; in fact, they could be linked since, for example, risk-shifting could lead to reduced flexibility and vice versa.

Overall, it is reasonable to expect a positive relation between overpayment and financial distress. We investigate this prediction by building a simple model of expected payout based on standard accounting, financial, and market variables to identify over-payers and examine their distress risk as well as their future survival compared to under-payers. In the spirit of Opler, Pinkowitz, Stulz, & Williamson (1999), we define as excess payout the difference between the actual and expected level, where the expected payout is based on a number of factors shown in the literature to explain the decision to initiate a payout or change the payout level and composition.[5] This paper does not claim to construct an optimal payout model. Rather it calculates expected payout based on a number of well-established in the literature observable payout determinants.

[4] Hereafter, we use the terms "excessive payout" and "overpayment" interchangeably.

[5] For example see DeAngelo, DeAngelo, & Stulz (2006); Fama & French (2001); Francis, Hasan, John, & Song (2011); Grinstein & Michaely (2005); Grullon, Michaely, & Swaminathan (2002); Jagannathan, Stephens, & Weisbach (2000); Kulchania (2016).

Even though the potential of unobservable bias is omnipresent in any empirical study in finance, our model includes a comprehensive range of the most important payout determinants according to prior work. Furthermore, we cannot think of any reason why any omitted variables will systematically bias the results in favor of our conclusions.

What, though, leads firms to overpay? In a frictionless environment with perfect capital markets, firms are able to adjust their capital structure without incurring costs (Miller & Modigliani, 1961). However, capital markets are not frictionless, which drives firms to maintain financial flexibility in order to meet unexpected capital shortages (Denis, 2011). Surveyed executives regularly cite financial flexibility as the most prominent factor in determining their firms' capital structure and payout policy (Brav, Graham, Harvey, & Michaely, 2005; Graham & Harvey, 2001). Empirical evidence also suggests that firms want to maintain financial flexibility, especially when they face high cash flow variability, growth, and R&D expenditure (Bates, Kahle, & Stulz, 2009; Harford, 1999; Opler et al., 1999). However, maintaining financial flexibility comes with the disadvantage of agency costs (Jensen, 1986). These costs lead firms to adjust their financial flexibility under increasing pressure from investors to make payouts (DeAngelo, Gonçalves, & Stulz, 2018), since payouts are used for reducing the cash balance available to managers, especially entrenched ones (Harford, Mansi, & Maxwell, 2008). Within this framework, there are three well-established channels that could influence managers' decision to overpay.

First, shareholder demands about achieving excess returns through investment opportunities outside the firm could make managers overpay. This channel is consistent with catering considerations (Baker & Wurgler, 2004) explaining overpayment. At the same time, pressure from short-term-oriented shareholders to prop up share prices leads to significant increases in share buybacks (Gaspar, Massa, Matos, Patgiri, & Rehman, 2012). Second, managerial incentives could lead to increases in share repurchases. Cheng, Harford, & Zhang (2015) find that, when a CEO's bonus is tied to earnings per share (EPS) targets, her firm is more likely to buy back shares. They show that share repurchasing increases the probability of the CEO receiving a bonus as well as the magnitude of that bonus. Thus, establishing a link between CEO pay structures and repurchasing activity. In addition, Hribar, Jenkins, & Johnson (2006) suggest that managers make use of repurchases as a tool to meet or exceed analysts' EPS forecasts. Third, managers tend to have their own styles for policies such as capital structure and payouts (Bertrand & Schoar, 2003) and make sub-optimal decisions due to overconfidence (Chen & Wang, 2012; Malmendier & Tate, 2005; Malmendier, Tate, & Yan, 2011), past life experiences (Bernile, Bhagwat, & Rau, 2017), career experiences involving financial distress (Dittmar & Duchin, 2016), or through routinely mis-calibrated predictions about future cash flows and demand volatility (Ben-David, Graham, & Harvey, 2013).

The decision to overpay can also be driven by risk-shifting incentives as firms become more levered and distressed (Galai & Masulis, 1976; Jensen & Meckling, 1976). While most prior work has identified asset substitution as the most likely form of risk-shifting (e.g., Eisdorfer, 2008; Gilje, 2016), a distressed firm's shareholders can also engage in overpayment to transfer wealth from creditors (e.g., Smith & Warner, 1979). In the extreme, as Black (1976) argues, firms can pay out all their assets to shareholders, leaving the creditors with an "empty shell". This wealth transfer effect is empirically supported for share repurchases (Maxwell & Stephens, 2003), dividends (Acharya et al., 2017; Dhillon & Johnson, 1994), and total payouts (Chu, 2018; Pryschepa, Aretz, & Banerjee, 2013). Since shareholders hold an option to default strategically, which is particularly valuable when debt renegotiation is possible (e.g., Davydenko & Strebulaev, 2007; Favara, Schroth, & Valta, 2012; Garlappi, Shu, & Yan, 2008; Garlappi & Yan, 2011), overpayment may not significantly increase shareholders' risk exposure.

We analyze firm-year observations for all publicly listed industrial US firms from 1975 to 2016 and employ a set of variables established in the payout literature to identify firms that pay out more (or less) than expected, where the expected total payout (i.e., dividends plus share repurchases) is estimated by our model. We then classify observations with positive total payouts (i.e., payers) as over-payers or under-payers. We recognize that there is no unambiguous model of "expected" payout. Hence, we use several definitions of overpayment to classify our firms. We test whether overpayment is associated with a comprehensive set of accounting-based and market-based financial distress measures, involuntary delisting, and actual bankruptcy. Our findings suggest that overpaying firms are, on average, higher on the financial distress risk spectrum and have a shorter lifespan than underpaying firms. Our findings are also economically significant. For example, the average default probability based on Bharath & Shumway's (2008) approximation of Merton's (1974) distance to default model is 5.12% for over-payers compared with 2.25% for under-payers. Moreover, compared to under-payers, over-payers endure smaller assets and sales growth a few years after overpaying.

In an attempt to better understand the decision to overpay, we run a series of analyses. First, we use exogenous changes to import tariffs and commodity prices to identify whether reduced-flexibility or risk-shifting considerations drive the decision to overpay. We find that large import tariff cuts and jumps in commodity prices reduce the likelihood of overpayment, which is inconsistent with risk-shifting explanations and more aligned with financial flexibility considerations. We then examine firm market reactions to overpayment both in bond and stock markets, in order to identify potential wealth transfers from creditors to shareholders in line with the risk-shifting hypothesis. However, our evidence of negative market reactions in both markets again does not support risk-shifting inferences. Finally, we follow the literature on behavioral explanations of dividend payout policies and find that the existence of an overconfident CEO in a firm is negatively related to the likelihood of overpayment. This is consistent with overconfident CEOs relying on peers when determining dividend increases (Grennan, 2019). The finding that less overconfident CEOs are more likely to engage in excess payouts is consistent with them trying to cater to the needs of investors that prefer high dividend-paying firms even at the expense of the average investor in the firm, as amply illustrated by our reported negative market reaction to overpayment in equity markets. Using the dividend premium (Baker & Wurgler, 2004) to capture catering incentives we find evidence in line with this explanation of overpayment.

The primary contribution of this study is the focus on the relation between overpayment and financial distress. Prior literature has looked at payout levels without focusing on excess payouts. There are three papers that are closely related to what we do, even though none of the three investigates excess total payouts. Chu (2018) uses mergers between creditors and shareholders of the same firm as a shock to shareholder-creditor conflicts and finds that this shock results in reduced payouts with a stronger effect for firms in financial distress. Even though this study has a clear identification strategy, its external validity is questionable given the very limited number of shocks considered. In contrast, we consider the full dataset of payers, aiming to generate findings that can be generalized. We build a comprehensive model of expected total payout to identify under- and over-payers. Our findings are collectively inconsistent with risk-shifting explanations of overpayment, thus, offering new insights to this strand of literature.

Almeida, Fos, & Kronlund (2016) provide evidence that repurchases motivated by managers' desire to meet EPS-targets lead to reductions in employment, investment and cash holdings. Even though they build conjectures consistent with these repurchases being excessive, they do not attempt to model expected payout. They neither study the effect of these repurchases on financial distress nor consider dividend payments. Thus, we provide novel evidence relative to this study.

Finally, Chen & Wang (2012) find that some financially-constrained firms carry out repurchases. Compared with financially-unconstrained repurchasing firms, constrained firms that buy back stock tend to experience poorer post-buyback abnormal returns and operating performance as well as higher levels of distress risk. They attribute their findings to managerial hubris or overconfidence. In our study, we consider both dividends and stock repurchases and build a comprehensive model of expected payout to identify over- and under-payers. We do not compare payers to non-payers and provide a comprehensive list of reasons why researchers should avoid doing so in this context. Importantly, we find that overconfidence is associated with a lower likelihood to overpay, which is consistent with peer-effects and catering explanations of payout.

2. Sample and data

2.1. Payouts and Other Variables

We construct our sample by including all publicly traded US firms in the Center for Research in Security Prices (CRSP) / Compustat merged (CCM) database between 1975 and 2016. Following the extant literature, we exclude financial firms (SIC codes 6000-6999), utilities (SIC codes 4900-4949), and securities other than common stock. Total payout is estimated as the sum of the dollar value of common dividends (Compustat item DVC) and repurchases (Compustat item PRSTKC minus the reduction in the book value of preferred stock, item PSTKRV). Consistent with prior studies (e.g., Bonaimé, Hankins, & Harford, 2014; Desai & Jin, 2011; Dittmar, 2000; Leary & Michaely, 2011), we scale payouts by market capitalization. We consider market capitalization to be preferable to the book value of total assets or earnings since our objective is to reliably identify companies that provide comparatively larger or smaller payouts. Compared to book values, market capitalization reflects relevant information in a timelier manner, including information on intangible assets. Earnings are problematic since they can also be negative, in which case the payout variable cannot be defined.[6] CCM also contains the information we need to construct all firm-level financial distress and control variables. We use the following accounting-based and market-based financial distress measures: *Zmijewski-score, O-score*, *Z-score – Dummy*, *Default probability*, *Distance to default*, *CHS-score*, and *Default probability (CHS)*. The total payout estimation sample extends until 2011 to allow for the analysis of a firm's delisting and bankruptcy probability over a leading five-year period on a rolling basis, with 2016 being the final year of the analysis. We obtain information on delisting events from CRSP, and data on Chapter 7 and Chapter 11 bankruptcy filings mainly from Thomson SDC Platinum.[7] The final sample

[6] One criticism regarding the use of market capitalization as a denominator in the payout variable is that market prices are volatile and could be affected by market-wide, rather that firm-specific, events. Depreciation in a firm's stock price could lead to a significant increase in the value of the payout variable, possibly leading to the firm's classification as an over-payer. However, we note that (a) a firm that does not change its payout policy in the face of significant macro events could be rightly classified as an over-payer, (b) our classification of persistent over-/under-payers deals with the impact of temporary/idiosyncratic events, and (c) we use other denominators as well and our results remain unchanged (see Section 4 for more details).

[7] We thank Kevin Aretz for providing a comprehensive baseline dataset of bankruptcy filings based on Thomson SDC Platinum data and complementary information from the Web. We rely on Thomson SDC Platinum and Lynn LoPucki's website (http://lopucki.law.ucla.edu) to extend and update this dataset. However, we do not have information on filings that took place before the 1980s.

consists of 82,425 firm-year observations comprised of 11,504 unique US industrial firms between 1975 and 2011. All relevant variables included in this paper are defined in the appendix.

2.2. Descriptive Statistics

Figure 1 shows the historical trends in average corporate payouts scaled by market capitalization. We observe that total corporate payouts declined during the early 1980s, 1990s, and 2000s. Since 2003, total payouts have exhibited an upward trend surpassing the historical highs of the late 1970s. Moreover, dividends have declined steadily over most of our time-series, stabilizing toward the late 2000s, with share repurchases driving corporate payouts in recent years.

[Insert Figure 1 about here]

Table 1 provides the summary statistics for the main variables[8] used in this paper. Panel A shows that, across our sample period, firms pay out, every year on average, approximately 2.2% of their market capitalization to their shareholders. The average firm in our sample has a leverage ratio of 0.18, 13% of its assets in cash, a market-to-book ratio of 1.7, and has been trading publicly for an average of 15 years. Interestingly, while the average firm has positive cash flows (a mean of 0.07), the average retained earnings are negative, at -0.15.

[Insert Table 1 about here]

Panel B reports the descriptive statistics of the financial distress measures we use in this study. Increases in the variables *Zmijewski-score*, *O-score*, *Default probability*, *CHS-score*, and *Default probability (CHS)* indicate higher financial distress. In contrast, *Z-score – Dummy* and *Distance to default* are inverse financial distress measures. The average firm in our sample is not financially distressed, as is amply illustrated by all our financial distress measures. For example,

[8] In order to mitigate the impact of outliers, which can be particularly large in our dataset, all variables, with the exception of binary variables, are winsorized at the 1% and 99% tails.

the accounting-based O-score ratio is approximately -3.76, which indicates a 2.27% probability of bankruptcy for the average firm. The average *Z-score – Dummy*[9] of our sample is 0.84, which is similar to Brockman, Martin, & Unlu (2010), and indicates that 84% of the firm-years in our sample are classified as not financially distressed based on Altman's Z-score. Our market-based measures point to the same conclusion. Consistent with Bharath & Shumway (2008), we estimate Merton's (1974) distance to default and respective default probability; the average distance to default is 6.47, which is similar to those in Chava & Purnanandam (2010) and Anantharaman & Lee (2014). Following Conrad, Kapadia, & Xing (2014), we also estimate Campbell, Hilscher, & Szilagyi's (2008) CHS-score and associated *Default probability (CHS)*, with the mean values being -6.95 and 1.89 respectively.

In order to examine a firm's mortality and survival in relation to its payout, we consider both voluntary and involuntary delistings, as well as Chapter 7 and Chapter 11 bankruptcy filings, over a five-year period following the payout year (year *t*) in our sample firms. We follow Bhattacharya, Borisov, & Yu (2015) to classify delistings as voluntary and involuntary. For voluntary delistings, we assess the payout policies for firms that are involved in (a) mergers and acquisitions and (b) exchange transactions. For involuntary delistings, we assess the payout policies for (c) firms that are liquidated, that is, forced to cease operations and sell their assets; (d) firms that are dropped from a stock exchange for reasons other than liquidation or voluntary delisting; and (e) a combination of firms that are liquidated or dropped from the exchange. The average voluntary delisting probabilities over a five-year period due to mergers and exchange transactions are 18.8%

[9] Following Brockman et al. (2010) and Pryschepa et al. (2013), we use *Z-score – Dummy,* which is a binary variable that equals one if Altman's (1968) Z-score is higher than 1.81 and zero otherwise. We do this due to the skewness of the distribution of Altman's Z-score in our sample.

and 0.9% respectively. Given that the focus of our study is on involuntary delistings, the probabilities for *Liquidation* and *Exchange dropped* are more important to us. The average probabilities of liquidation and being dropped from the exchange are 0.3% and 13.6% respectively over a five-year period, with the combined group exhibiting a probability of 13.9% over the period from 1975 to 2016. Finally, the average probability of a bankruptcy filing is significantly smaller, at around 4.8%.

3. Identifying over-payers and under-payers

We employ a standard Tobit model to identify the expected payout based on a set of established variables commonly used in the literature (e.g., DeAngelo et al., 2006; Fama & French, 2001; Francis et al., 2011; Grinstein & Michaely, 2005; Kulchania, 2016). We then use both the expected and actual payout levels to identify firm-years with higher than expected (over-payers) and lower than expected (under-payers) payouts. While our payout model is estimated using observations for both payers (i.e., firms with positive payouts) and non-payers, we only consider payers when creating our two sub-samples of over- and under-payers. This choice is motivated on several grounds. In particular, we find that non-payers have significantly lower profitability and retained earnings than payers (untabulated). The average for the latter variable is negative for non-payers and positive for payers. Therefore, a significant fraction of non-payers may be forced to follow a zero-payout policy owing to binding legal (e.g., Mansi, Maxwell, & Wald, 2009) or contractual constraints such as covenants. Thus, the managers of these firms are likely to have little discretion over payout policy, which reduces the usefulness of these observations in our context. Furthermore, non-payers are smaller and have more valuable growth opportunities, measured by the market-to-book ratio, than the payers (DeAngelo et al., 2006; Fama & French, 2001) – opportunities they would lose in the case of bankruptcy. Hence, they are far less likely to carry out risk-shifting activities (e.g., Acharya et al., 2017) or to adjust their policy on financial flexibility due to payouts, since they are not making any payouts in the first place. Finally, in our estimations, a non-payer would mechanically be classified as an under-payer since the expected payout for a non-payer is always positive. It is more meaningful to study those firms that deliberately decide to choose comparatively low payouts.

Prior literature on payout policy has clearly identified a set of determinants that explain the variation in the magnitude of payouts to a large extent and in a robust way. A firm's cash distribution is positively related to the firm's profitability, cash holdings, retained earnings, size, and age, while risk and growth opportunities should be negatively associated with payouts. Leverage could also be relevant as a payout determinant. In our model of expected total payout, we consider these well-established determinants in order to build a reliable model. An additional benefit of using variables that are well established in the literature is that it allows us to avoid data-mining and reporting findings that are heavily reliant on arbitrary and questionable choices of payout determinants. Overall, we rely on the following model:

$$Total\ payout_{i,t} = \alpha + \beta_1 Cash\ flow_{i,t} + \beta_2 Market - to - book_{i,t} + \beta_3 Firm\ size_{i,t} + \beta_4 Leverage_{i,t} + \beta_5 Retained\ earnings_{i,t} + \beta_6 Cash\ holdings_{i,t} + \beta_7 Idiosyncratic\ risk_{i,t} + \beta_8 Systematic\ risk_{i,t} + \beta_9 Firm\ age_{i,t} + u_{i,t} \quad (1)$$

where *Total payout* is total payout over market capitalization. As explained in Section 2.1, we rely on market capitalization as the denominator of our payout variable in order to identify over- and under-payers in a precise and timely manner.

However, as highlighted previously, market capitalization is affected by stock market fluctuations that could drive our findings.[10] In untabulated robustness tests, we follow Michaely and Qian (2017) and repeat our model after deflating total payout by book equity. Similarly, we consider total payout models in which the payouts are scaled by earnings, or with an unscaled log-payout as the dependent variable. We also augment our set of controls with the inclusion of the stock return over the past year, in order to capture the impact of recent stock market fluctuations on market capitalization. Overall, we obtain qualitatively similar findings. Furthermore, all our results remain qualitatively similar when we replace total payout with dividends or repurchases in Equation (1). We also replicate the analysis of this model with (a) one-year-lagged control variables and (b) using 1-, 3- and 5-year windows prior to the actual payout to estimate expected payouts and the results remain unchanged.

The payout determinants we use are as follows: *Cash flow,* estimated as operating income divided by total assets; *Market-to-book,* estimated as firm market value over total assets; *Firm size,* which is the natural log of inflation-adjusted market capitalization; *Leverage,* defined as long-term debt over firm market value; *Retained earnings,* deflated by total assets; *Cash holdings,* calculated as cash and short-term investments over total assets; *Idiosyncratic risk,* estimated as the standard deviation of the residuals of a regression of the daily stock returns in excess of the risk-free rate

[10] We note that, in our sample, 73% of over-payers increased their total payout (unscaled) during the year by a median increase of 17.3%. This fraction was significantly smaller (65%) for under-payers, which increased their total payout (unscaled) during the year by a median increase of 2.8%. Thus, over-payers appear to actively increase their payouts, and their classification as over-payers is not primarily due to changes in market capitalization. In unreported analysis, we also find that over-payers invest less in property, plant and equipment (PPE), capital expenditure (CAPEX) and research and development (R&D) and increase more their short-term debt relative to under-payers in the year prior to overpaying.

on the value-weighted market return; *Systematic risk*, defined as the standard deviation of the predicted value of a regression of the daily stock returns in excess of the risk-free rate on the value-weighted market return; and *Firm age*, calculated as the number of years since a firm's first appearance in CRSP.[11] Finally, we control for the 49 Fama-French industries and year fixed effects, while the standard errors are clustered at the firm level. The results in Table 2 show that larger, lower-growth and more mature firms, with higher cash and retained earnings levels, pay out more to their shareholders. In addition, we find that firms with lower risk, both idiosyncratic and systematic, make larger payouts, consistent with Rozeff (1982) who finds an inverse relation between payout level and a firm's systematic risk.

[Insert Table 2 about here]

If firm *i* makes no payout in year *t* we classify it as a non-payer. Based on the Tobit estimations on the expected and actual payouts, we classify each firm as an over-payer or under-payer. For instance, if the residual $u_{i,t}$ is positive then we classify firm *i* in year *t* as an over-payer and if it is negative we classify that firm as an under-payer. Based on this classification method

[11] Following recent studies, in unreported analysis, we further control for total institutional ownership (IO) and low-turnover IO to account for the impact of institutional investor preferences on the payout level (Harford, Kecskés, & Mansi, 2018); the average industry level of all other characteristics (cash flow, market-to-book, size, leverage, retained earnings, cash holdings, idiosyncratic and systematic risk) as well as the instrumented total payout at the industry level to account for peer influence on payout policies (Adhikari & Agrawal, 2018); the fraction of seniors in a firm HQ's county to account for local dividend clienteles (Becker, Ivković, & Weisbenner, 2011); the hostile takeover index by Cain, McKeon, & Solomon (2017) as well as a business combination laws dummy (Francis et al., 2011) to control for the impact of antitakeover legislation on payout policies. All our results are robust to the addition of these variables to the expected payout model and available from the authors upon request.

(*mid-point classification*) some firms may be marginally classified as over-payers or under-payers by construction.

To ensure our results are robust, we also use two alternative classification methods. The first is based on terciles (*tercile classification*), where we split the set of observations into equal terciles based on the model residuals and classify them into three main categories: under-payers, moderate-payers, and over-payers. Meanwhile, firms that make no payouts in year *t* are still classified as non-payers. This deals with the problem of possible misclassification of marginal over-payers or under-payers. The second classification is based on the consistency of the firm payout policy (*persistent classification*). Specifically, if a firm is identified by the Tobit estimations for three consecutive years as having the same relation between actual and expected payout, we classify it into one of the following three categories: persistent non-payers, persistent under-payers, and persistent over-payers. Alternatively, if it is not identified as having the same relation for three consecutive years, it is classified into the category other payers (unclassified). This classification method is useful since we wish to identify deliberate over-payers as opposed to firms that may pay more than expected only once by miscalculation. All our findings are robust to the use of these alternative classifications (untabulated).

Our classifications appear to map real cases quite well. For example, Dell Corp. appears in our analysis as a persistent over-payer. For a number of years before turning private in 2013, Dell poured billions of dollars into its extensive stock repurchase programs, leading the way for similar behavior in the tech sector. It was consistently and heavily criticized for doing so.[12]

As mentioned earlier, firms that make payouts tend to be larger, more profitable, less risky, older, and to have lower growth (DeAngelo et al., 2006; Fama & French, 2001; Grullon &

[12] See, for example, "The problem with buybacks, Dell edition" – Salmon, Reuters (September 4, 2012).

Michaely, 2002; Hoberg & Prabhala, 2009). Our Tobit estimations of Table 2 fully confirm these empirical regularities for the level of the total payout. Thus, one might expect that, among payers, firms that overpay share characteristics with firms that tend to make payouts; however, this is not generally the case in our sample. We find that a number of large, mature, and established firms tend to underpay, while other similar firms tend to overpay. For instance, companies such as DuPont, Walmart, Procter and Gamble, Nike, and 3M underpay, while other established and mature firms such as Cisco, Moody's, and AT&T overpay. There are other cases, such as Conagra, McDonalds, Coca Cola Co, Merck, Verizon, Northrop Grumman, Heinz, and Intel that sometimes overpay but at other times underpay.

More importantly, when evaluating the characteristics of over-payers, we do not find any clear patterns traditionally associated with payout policy. As reported in Panel A of Table 3, while, as one might expect, over-payers have fewer growth opportunities, as proxied by a lower *Market-to-book*, larger cash holdings, and less systematic risk, they are also less profitable, smaller, and younger, and are characterized by lower retained earnings, more leverage, and higher idiosyncratic risk. Thus, our method does not merely identify firms that make large payouts, but allows us to study firms that choose payouts that appear excessive.

Panel B of Table 3 provides the average actual and expected payout yields for each classification: non-payers, under-payers, and over-payers. Our focal point is over-payers and under-payers. The results show that firms classified as under-payers pay out significantly less than expected. Moreover, the average expected payout for under-payers is significantly higher than that for over-payers. In spite of this, over-payers pay out more than double the expected payout level. Overall, these findings suggest that over-payers are firms that make payouts that are particularly large and significantly higher than the payouts one would expect based on their characteristics. It is important to reiterate here that over-payers need not be high-payout firms, even though this appears to be the case for the average over-payer in our sample, as reported in Panel B of Table 3. Over-payers should simply have an actual payout yield above the estimated expected one.

[Insert Table 3 about here]

4. Over-payers, financial distress, and firm survival

Based on prior literature (e.g., Chen & Wang, 2012), we anticipate higher than expected payouts to be damaging to firms since they reduce financial flexibility and, ultimately, increase financial distress (the *reduced-flexibility hypothesis)*. At the same time, firms that are financially distressed may engage in a large amount of cash distribution in order to transfer wealth from creditors to shareholders (the *risk-shifting hypothesis*) (Acharya et al., 2017; Black, 1976; Smith & Warner, 1979). These two mechanisms are not mutually exclusive and could reinforce each other, possibly through feedback effects. Overall, we expect over-payers to be more financially distressed than under-payers.[13] We investigate our conjecture below.

Table 4 reports the results from the univariate analysis of several financial distress measures across our main classifications of firms: non-payers, under-payers, and over-payers. The focus of our analysis is on comparing financial distress between over-payers and under-payers; however, we also tabulate the differences between over-payers and non-payers for completeness.

[Insert Table 4 about here]

[13] One could argue that under-payers might also end up higher on the financial distress spectrum if managers use the free cash flow for private benefit or to invest in pet projects that destroy value. However, this leads to a joint hypothesis that under-payers also experience significant agency problems, which does not necessarily hold true. In any case, this argument should work against us finding significant results.

Across all measures, over-payers have statistically significantly higher financial distress than under-payers. Over-payers are characterized by significantly higher values for the variables *Zmijewski-score*, *O-score*, *Default probability*, and *Default probability (CHS)*, whereas the average value of *Z-score – Dummy* is lower for over-payers. For example, over-payers are on average 2.87% more likely to default, having an average *Default probability* (5.12%) more than twice that of under-payers (2.25%). Overall, we find consistent evidence suggesting that over-payers are higher on the financial distress spectrum.

In untabulated analysis, we identify firms with above-median payouts and compare them to firms with below-median payouts. Consistent with prior literature, we find that above-median-payout firms appear to be less distressed along several dimensions; that is, they have a higher *Z-score – Dummy*, lower *O-score*, and lower probabilities of being delisted and of filing for bankruptcy. We reiterate that over-payers do not necessarily have high levels of payout; rather, they have payouts that are higher than expected.

[Insert Table 5 about here]

Since over-payers are more financially distressed, we assess whether overpaying firms are more likely to delist and be subject to bankruptcy filings than underpaying firms. The univariate tests in Table 5 show that overpaying firms are more likely to merge over a five-year period following the payout, than under-payers. The difference is statistically insignificant using the *mid-point* classification but statistically significant when using the *tercile* and *persistent* classifications (untabulated). The results also show that non-payers, on average, delist and drop from the exchange more frequently than firms making payouts, which is expected as non-paying firms are typically smaller, riskier, and have higher growth than firms making payouts (DeAngelo et al., 2006; Fama & French, 2001). Most importantly, though, the results show that it is significantly more common among over-payers to be forced into liquidation or have their stock dropped from the exchange, than among under-payers. This suggests that over-payers are more likely to delist involuntarily (Bhattacharya et al., 2015) and therefore have, on average, a shorter lifespan as listed firms. In line with this finding, the probability of a bankruptcy filing is also significantly larger for over-payers than for under-payers.

In summary, the evidence shows that firms that overpay are more financially distressed, are more likely to delist involuntarily, and are more likely to be involved in a bankruptcy case over a five-year period following the excess payout. This finding is consistent both with the notion that particularly large payouts may be detrimental to firms (the *reduced-flexibility hypothesis*) and with the argument that distressed firms may have an incentive to risk-shift through payouts (the *risk-shifting hypothesis*).

A potential weakness of the univariate tests stems from the fact that over-payers are inherently different from under-payers and these differences may drive the relation between overpayment and distress (confounding effects). Furthermore, this kind of analysis remains silent about the potential direction of the reported effect. In our Online Appendix, we report two sets of results using covariate matching and falsification tests (Kini, Shenoy, & Subramaniam, 2016) that tackle these issues.

Finally, we study the real effects of overpayment on firms' investment decisions and future growth. Table OA.3 of the Online Appendix presents the future changes in assets, sales, and plant, property, and equipment (PPE) for non-payers, under-payers, and over-payers over a five-year period. Focusing on the comparison between under- and over-payers, we find that over-payers experience significantly smaller future changes in assets, sales, and PPE. This finding is consistent with overpaying firms experiencing a slowdown in their growth and investment compared to under-payers. Thus, the decision to overpay leads to real investment effects for the affected firms.

5. Determinants of overpayment

This section presents results on the drivers of the decision to overpay. We first use exogenous changes to import tariffs and commodity prices to gauge their impact on the decision to overpay. This analysis allows us to determine whether firms' response to these exogenous changes is consistent with risk-shifting or financial flexibility considerations driving overpayment. For the same reason, we also examine the market reaction of bond- and stock-holders to overpayment. Finally, we investigate the role of CEO overconfidence and catering incentives in the decision to overpay.

5.1. Import tariff cuts

A reduction in import tariffs can lower the barriers foreign firms face when attempting to enter the domestic product market. The ensuing increase in product market competition decreases the profit margins of domestic firms (Bernard et al., 2006), increases the attractiveness of holding more cash (Frésard, 2010), and reduces corporate payouts due to the increasing of firms' cash reserves (Hoberg et al., 2014). Bernard et al. (2006) suggest that this increase in product market competition also increases the probability of exit, particularly for low-productivity firms. They also find that large tariff cuts could lead to strong firm productivity growth as economic activity is reallocated to high-productivity firms after the increase in market competition.

We study the impact of a significant tariff reduction (*Tariff cut*) on the likelihood of overpaying. If overpayment is driven by risk-shifting considerations, in the event of a tariff cut shock, which could increase the risk profile of the firm through for example higher exit risk, managers should accelerate the wealth transfer from creditors to shareholders, leading to an increase in the likelihood of overpayment. However, if managers want instead to preserve the firm's financial flexibility following a negative cash flow shock or increased growth opportunities due to tariff cuts, they will become less likely to overpay.

In order to estimate cuts in import tariffs, we follow Frésard (2010), Valta (2012), and Frésard & Valta (2016) and collapse the import tariff duties to the four-digit SIC industry and year level. A dataset on product-level import tariffs has been compiled by Feenstra (1996), Feenstra, Romalis, & Schott (2002), and Schott (2008),[14] but covers only manufacturing industries. For each four-digit-SIC-industry-year we estimate the ad valorem tariff rate as the duties collected by US Customs, divided by the value of imports (Free-on-Board value of imports), as in Kini et al. (2016) and Frésard (2010). Then, we identify as significant tariff cuts those industry-years for which import tariffs are reduced by more than twice the industry mean during 1975 to 2011. Like Kini et al. (2016), we avoid temporary shifts in import tariffs by excluding instances when significant tariff increases of similar magnitude occur the year following a tariff cut. Also, we exclude tariff changes that occur between 1988 and 1989, due to the change in the coding of imports. In alternative specifications, instances where import tariffs drop significantly but are smaller than 1%, are not treated as tariff shocks. Our results (untabulated) based on these alternative specifications remain qualitatively the same. Overall, in our sample of over-payers and under-payers 17.14% of firm-year observations experience a tariff shock, suggesting there is reasonable variation in tariff shocks to be considered as exogenous to the payout decision.

Table 6 reports the results on the impact of a significant tariff reduction (*Tariff cut*) on the likelihood of overpaying. Note that *Tariff cut* is measured with a one-year lag relative to

[14] We use data available from the webpages of Robert Feenstra (http://cid.econ.ucdavis.edu/ust.html) for the years 1975-1988 and Peter Schott (http://faculty.som.yale.edu/peterschott/sub_international.htm) for the years 1989-2011.

overpaying. Our results show that a tariff shock leads to a reduction in the likelihood of a firm becoming an over-payer, which is inconsistent with risk-shifting inferences.

A firm's payout policy is also influenced by its peers (Grennan, 2019), its geographic location (John, Knyazeva, & Knyazeva, 2011; Ucar, 2016), and local shareholder clientele (Becker et al. 2011), while neighboring firms can significantly influence firms' financial policy decision-making (Gao, Ng, & Wang, 2011). Therefore, we also control for the influence of peer firms (*Industry propensity to overpay*) and location (*State propensity to overpay*) on the likelihood of a firm becoming an over-payer. Even after controlling for these factors, our findings on the negative impact of tariff shocks on the likelihood of overpaying hold.

[Insert Table 6 about here]

To ensure our results are not driven by the binary classification between over-payers and under-payers, we repeat our analysis by using a linear regression on the residual from our baseline model (Equation 1). The (untabulated) results confirm our earlier findings of tariff cuts reducing firms' excess payouts. Overall, our findings suggest that managers take the rational decision of reducing the likelihood of overpaying in order to preserve financial flexibility, consistent with Opler et al. (1999), Harford (1999), and Bates et al. (2009). Tariff cuts seem to act as a disciplinary mechanism that forces managers who engage in overpayment to change course, probably in consideration of the reduced current and expected future cash flows or because of increased growth opportunities (Bernand et al., 2006). These findings are arguably consistent with financial flexibility considerations and completely at odds with risk-shifting ones. Additionally, in unreported analyses, we rely on a specification with interaction terms to evaluate whether the tariff cuts strengthen the relationship between overpayment and financial distress, in line with the risk-shifting hypothesis. We observe that this relationship is not significantly affected by tariff shocks, which casts further doubt on risk-shifting being the main channel that drives the relation between overpayment and financial distress.

5.2. Commodity price jumps

Firms have varying risk exposure across different types of commodities depending on their reliance on these commodities as inputs to their production processes (Purnanandam, 2008). Changes in commodity prices affect each firm's profitability differently due to their different revenue and cost structures (Ellul & Pagano, 2019). These changes could provide supply shocks (Ball & Mankiw, 1995), which lead to economic uncertainty that restricts firms from investing. Overall, we argue that changes to commodity prices could lead to changes in firms' risk profiles either directly through their impact on production and investment or indirectly through firms' exposure to economic uncertainty. We take advantage of exogenous changes to commodity prices using changes in the Producer Price Index (PPI), which measures the weighted cost of all metals, oil and farm commodities. Prior research argues that PPI changes capture exogenous variation in these input prices (Ball & Mankiw, 1995; Purnanandam 2008). We argue that if risk-shifting considerations relate to overpayment then firms that experience an increase to their risk profile from exogenous increases in commodity prices should experience a higher likelihood of overpayment. This should be particularly true when there are significant jumps in PPI and for firms with more sensitive operating income to PPI jumps.

We estimate PPI changes as the annual percentage change in PPI at the fiscal month-year end for each firm *i* since commodity price fluctuations are typically driven by short-term demand imbalances (Chen, Rogoff, & Rossi, 2010). Ball and Mankiw (1995) argue that firms respond to large commodity price shocks, not to small shocks, and large shocks have a disproportionately large impact in the short run. Therefore, as an alternative to PPI changes, we use large increases (jumps) in the relative prices of PPI. In particular, we define jumps as a binary variable that takes the value of one when there is an annual percentage increase that is larger than two standard deviations based on the annual PPI changes across the time period of our study. Some firms may be immune (or have an inverse relation) to PPI price changes. In that case the exogenous variation in PPI prices may have no direct (or an inverse) impact on firm risk. Therefore, we identify those firms that are sensitive to PPI price changes since we expect more pronounced effects for them. Similar to Purnanandam (2008), we regress the quarterly operating income after depreciation[15] deflated by total assets against the quarterly PPI changes. We identify firms as being sensitive if the regression coefficient is significant at least at the 10% level.

Table 7 reports our findings from this analysis. The coefficients for *PPI Change*, and *PPI Jump* as well as the interaction term *PPI Jump*PPI Sensitivity* are negatively and significantly related with the likelihood of overpayment, which acts as further evidence against risk shifting explanations of overpayment.

[Insert Table 7 about here]

5.3. Bond- and stock-holder reaction to overpayment

We examine the value consequences of the overpayment decision by gathering information on market reactions to overpayment by both debt- and equity-holders. The wealth transfer hypothesis predicts that changes in equity and bond values as a result of overpaying would be negatively correlated with a positive (negative) market reaction by shareholders (bondholders) (Maxwell & Stephens, 2003).

[15] Each regression has a minimum of 8 quarters and the maximum available over the time period of our study. As an alternative to operating income after depreciation, we use net income deflated by total assets, or EBITDA deflated by total assets and the results remain the same.

We gather bond trade data from Mergent-FISD and TRACE. Mergent-FISD has bond trades from 1994-2007, which we complement with bond trades from TRACE spanning 2002-2013. We apply the standard filters in the literature on bond trades as follows. We include non-puttable bonds with a reported maturity date and exclude bonds with less than 5 trades and trades that are reported after a bond's amount outstanding is equal to zero, and bonds with less than 3 months of data, as in Bessembinder, Jacobsen, Maxwell, & Venkataraman (2018). We also exclude zero-coupon bonds and bonds with rating of CCC or lower as in Bessembinder, Kahle, Maxwell, & Xu (2009), and exclude small trades with a nominal value of less than $100,000 as in Harris & Piwowar (2006) and Bessembinder et al. (2018). Finally, we limit our sample to US-dollar denominated bonds with a fixed-coupon and bonds that are senior and unsecured, as in Campello, Gao, Qiu, & Zhang (2018).

We combine multiple bonds from the same firm by computing the weighted average price returns (Billet, King, & Mauer, 2004; Campello et al., 2018), including accrued interest, weighted by the size of each trade in a given month and we keep only the trades that occur on the last 5 days of the month. The bond excess returns are estimated following the same procedure of Campello et al. (2018) by constructing 3x3 benchmark portfolios based on three risk classifications (based on credit rating) and three maturity classifications (Warga & Welch, 1993; Billet et al., 2004). We also exclude bond returns with an absolute value that is greater than 20% (Bessembinder et al., 2018). Finally, monthly stock returns are retrieved from CCM and excess returns are estimated using the Fama & French (2015) 5-factor model.

Similar to Crabbe (1991) and Ellul, Jotikasthira, & Lundblad (2011), we compare the monthly stock and bond excess returns for a number of monthly periods surrounding the fiscal year-month end of each firm in our sample. We do so because as time lapses both stock and bond markets get a better picture of the firm's riskiness and its total payout. Then we compare the stock and bond excess returns, and their correlations, between under-payers and over-payers. The univariate analysis (untabulated) for bond and stock excess returns shows that for up to the window (-4, +4) for bond returns and for all windows for stock returns both under-payers and over-payers have a negative performance. But over-payers are consistently performing worse than under-payers across all windows. For instance, for the 5 months surrounding the fiscal year end (-2, +2) stockholders lose 2.97% and bondholders lose 0.63% more in overpaying firms compared to underpaying firms. Moreover, the stock and bond returns are positively correlated. These results are not consistent with the wealth transfer hypothesis and thus do not support risk-shifting.

We regress overpayment on bond and stock excess returns, respectively. The results reported in Table 8 show that over-payers experience negative cumulative abnormal bond and stock returns across all horizons. These findings provide further support against risk-shifting inferences and confirm that stakeholders view overpayment as a bad decision.

[Insert Table 8 about here]

5.4. CEO overconfidence and catering incentives

To better understand this value destruction, we engage in an additional exercise to identify further determinants of overpayment. We note that the theoretical guidance from prior literature is rather limited since there is inadequate focus in prior work on the decision to overpay. Still, we make use of inferences from recent studies to guide our efforts. In particular, we follow the literature on behavioral explanations of dividend payout policies (see Baker & Wurgler (2013) for an extensive review of this strand of literature) and find that the existence of an overconfident CEO in a firm is negatively related to the likelihood of overpayment. Deshmukh, Goel, & Howe (2013) report a negative relation between overconfident CEOs and current dividend payouts, which they attribute to overconfident CEOs' overestimation of the value of future investments making them create financial slack now. Grennan (2019) shows that overconfident CEOs increase their reliance on peers when determining dividend increases. She argues that this is likely driven by overconfident CEOs relying excessively on peer actions and misreading peers' signals. We extend this literature by showing that overconfident CEOs are less likely to overpay, which is consistent with their reliance on peers when determining dividend increases.[16]

Our primary measure of CEO overconfidence is a stock option-based one, motivated by Malmendier & Tate (2005), Malmendier et al. (2011) and Campbell, Gallmeyer, Johnson, Rutherford, & Stanley (2011). Specifically, we follow Hirshleifer, Low, & Teoh (2012) and using CEO stock options data from Execucomp, we first estimate for each CEO-year the average realizable value, that is, options' total realizable value divided by the number of options held. We estimate the strike price as the fiscal year-end stock price minus the average realizable value. Then we estimate the moneyness of the options, which is the stock price divided by the estimated strike price. We define CEO overconfidence as a binary variable that takes the value of one if the moneyness is at least 67% in a given year,[17] and zero otherwise. The results in Table 9 show that CEO overconfidence consistently has a negative impact on the likelihood to overpay. Thus, less overconfident CEOs are more likely to engage in excess payouts. This would be consistent with

[16] Please note that our payout model controls for industry fixed effects. Therefore, any evidence of overpayment is above and beyond any industry clusters. In other words, if a firm's average peer firm "overpays" then this will be taken into account when estimating the firm's expected payout.

[17] In alternative specifications we classify a CEO as overconfident if there is at least 67% moneyness on unexercised options only after the first time a CEO had unexercised options with at least 67% moneyness, and our results remain the same.

less overconfident CEOs trying to cater to the needs of investors that prefer high dividend-paying firms even at the expense of the average investor in the firm, as amply illustrated by the negative market reaction to overpayment in equity markets. To test this catering argument, we regress the dividend premium[18] (Baker & Wurgler, 2004) on overpayment after controlling for a series of firm characteristics as well as proxies for the industry and state propensity to overpay. Table 9 reports these findings as well. The dividend premium is positively and significantly associated with excess payouts consistent with the catering argument. In unreported results, we find that the effect is driven by dividends and not repurchases, which is further evidence in favor of our conjectures.

[Insert Table 9 about here]

7. Conclusion

Despite the increasing attention paid by practitioners and commentators to record-level corporate payouts, and the continuous pressure managers face to distribute their significant cash holdings, there is limited evidence on the potential costs of excessive levels of payouts. We study a large sample of non-financial publicly listed US firms, and use a set of commonly accepted variables, to identify firms that pay out more (less) than expected, which we label as over-payers (under-payers). Using a comprehensive set of accounting- and market-based financial distress variables and firm survival measures, we find that, compared to under-payers, over-payers are higher on the financial distress spectrum, are more likely to involuntarily delist and more likely to be involved in a bankruptcy case. We also show that over-payers suffer lower future sales and

[18] We obtain monthly estimates of the dividend premium from Jeffrey Wurgler's website http://people.stern.nyu.edu/jwurgler/

assets growth than under-payers and experience negative debt and equity market reactions to overpayment.

We find that the decision to overpay is consistent with financial flexibility considerations but not in line with risk-shifting explanations. We also show that CEO overconfidence and catering incentives affect the likelihood of overpaying.

The currently unfolding global economic crisis due to the Covid-19 pandemic makes our findings highly relevant. The emergence of numerous firms seeking state-backed bailouts early in the crisis, whilst furloughing employees, closing down operations or leaving suppliers and creditors unpaid has raised questions over the optimal levels of financial flexibility in corporations. Our evidence on the determinants and consequences of excessive corporate payouts could inform both regulators and market participants in this debate. Future research should study the societal impact of excessive corporate payouts particularly during times of crisis.

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Appendix. Variable Definitions

This appendix presents detailed definitions for all the variables used in the study.

Payout variables	**Definitions**
Dividends	Common dividends (Compustat item DVC) over *Market capitalization*.
Repurchases	Purchase of common and preferred stock (Compustat item PRSTKC) minus the reduction in the book value of preferred stock (Compustat item PSTKRV), all scaled by *Market capitalization*.
Total payout	Sum of *Dividends* and *Repurchases*.

Payout determinants	**Definitions**
Book equity	Book equity is stockholders' equity (Compustat item SEQ) or book common equity (Compustat item CEQ) plus book preferred stock (Compustat item PSTK) or total assets (Compustat item AT) minus total liabilities (Compustat item LT), minus *Preferred stock*, plus deferred taxes and investment tax credit (Compustat item TXDITC), if available, minus the post-retirement benefit asset (Compustat item PRBA), if available.
Cash flow	Operating income before depreciation (Compustat item OIBDP) over total assets (Compustat item AT).
Cash holdings	Cash and short-term investments (Compustat item CHE) over total assets (Compustat item AT).
Firm age	Years since the firm's first appearance in CRSP.
Firm market value	Total assets (Compustat item AT) minus *Book equity* plus *Market capitalization*.
Firm size	Natural log of inflation-adjusted *Market capitalization* (using the consumer price index CPIAUCSL from FRED).

Idiosyncratic risk	Standard deviation of the residuals from a regression of the daily stock return (source: CRSP) in excess of the risk-free rate (from Kenneth French's website) on the market factor based on the value-weighted market return (source: CRSP). Daily returns over the fiscal year are used.
Leverage	Long-term debt (Compustat item DLTT) plus long-term debt due in one year (Compustat item DD1) over *Firm market value*.
Market capitalization	Market capitalization at the end of the fiscal year (Compustat item PRCC times item CSHO).
Market-to-book	*Firm market value* over total assets (Compustat item AT).
Preferred stock	Preferred stock is the liquidating value of preferred stock (Compustat item PSTKL) or the redemption value of preferred stock (Compustat item PSTKRV) or the par value of preferred stock (Compustat item PSTK). If items PSTKL, PSTKRV, and PSTV are not available, preferred stock is set to zero.
Retained earnings	Retained earnings (Compustat item RE) over total assets (Compustat item AT).
Systematic risk	Standard deviation of the predicted value from a regression of the daily stock return (source: CRSP) in excess of the risk-free rate (from Kenneth French's website) on the market factor based on the value-weighted market return (source: CRSP). Daily returns over the fiscal year are used.

Financial distress variables	**Definitions**
Change in net income	Change in net income (Compustat item NI) over the sum of the absolute values of the current and lagged net income.
CHS-score	Score computed using the coefficients from Column 4 of Table IV in Campbell et al. (2008).
Default probability	N(- *Distance to default*) * 100.
Default probability (CHS)	(1 / (1 + exp(- *CHS-score*))) * 100.
Distance to default	Bharath & Shumway's (2008) version of Merton's (1974) distance to default naïve measure.
Dummy losses	Binary variable that equals one if the sum of the current and lagged net income (Compustat item NI) is negative. Otherwise, it equals zero.
Funds from operations	Total funds from operations (Compustat item FOPT) or cash flow from operating activities (Compustat item OANCF) minus increase in accounts payable and accrued liabilities (Compustat item APALCH) minus decrease in inventory (Compustat item INVCH) minus decrease in accounts receivable (Compustat item RECCH) minus increase in accrued income taxes (Compustat item TXACH) minus net increase in other liabilities (Compustat item AOLOCH).
Negative equity dummy	Binary variable that equals one if total liabilities (Compustat item LT) are larger than total assets (Compustat item AT). Otherwise, it equals zero.
O-score	Ohlson's (1980) O-score is computed as follows: O-score = -1.32 - 0.407 * log((item AT * 1,000,000) / GNP price-level index) + 6.03 * (item LT / item AT) - 1.43 * ((item ACT - item LCT) / item AT) + 0.076 * (item LCT / item ACT) - 1.72 * *Negative equity*

	dummy - 2.37 * (item NI / item AT) - 1.83 * (*Funds from operations* / item LT) + 0.285 * *Dummy losses* - 0.521 * *Change in net income.* All items are from Compustat. The GNP price-level index is from FRED and is set to 100 for the year 1968.
Zmijewski-score	Zmijewski's (1984) score is computed as follows: Zmijewski-score = -4.336 - 4.513 * (item NI / item AT) + 5.679 * (item LT / item AT) + 0.004 * (item ACT / item LCT). All items are from Compustat.
Z-score – Dummy	A binary variable that equals one if Altman's (1968) Z-score is higher than 1.81 and zero otherwise. The Z-score is computed as follows: Z-score = 3.3 * (item OIADP / item AT) + 1.2 * ((item ACT - item LCT) / item AT) + item SALE / item AT + 0.6 * ((item CSHO * item PRCC) / (item DLTT + item DLC)) + 1.4 * (item RE / item AT). All items are from Compustat.

Firm survival variables	**Definitions**
Bankruptcy (year+5)	Binary variable that equals one if the firm is subject to a Chapter 7 or Chapter 11 bankruptcy case (source: Thomson SDC Platinum and http://lopucki.law.ucla.edu) in the subsequent five years. Otherwise, it equals zero.
Exchange dropped (year+5)	Binary variable that equals one if the stock is delisted due to being dropped from the exchange (source: CRSP delisting codes 500-591) in the subsequent five years. Otherwise, it equals zero.
Exchange transaction (year+5)	Binary variable that equals one if the stock is delisted due to an exchange transaction (source: CRSP delisting codes 300-390) in the subsequent five years. Otherwise, it equals zero.

Liquidation (year+5)	Binary variable that equals one if the stock is delisted due to a liquidation (source: CRSP delisting codes 400-490) in the subsequent five years. Otherwise, it equals zero.
Liquidation and Exchange dropped (year+5)	Binary variable that equals one if the stock is delisted due to being liquidated or dropped from the exchange (source: CRSP delisting codes 400-490 or 500-591) in the subsequent five years. Otherwise, it equals zero.
Merger and acquisition (year+5)	Binary variable that equals one if the stock is delisted due to a merger (source: CRSP delisting codes 200-290) in the subsequent five years. Otherwise, it equals zero.

Other variables	**Definitions**
Bond CAR	Bond CARs are estimated as bond returns adjusted for benchmark bond portfolio returns for a number of monthly periods surrounding the fiscal year-month end of each firm. Multiple bonds from the same firm are estimated as the weighted average price returns on the last 5 days of each month, including accrued interest. 3x3 benchmark bond portfolios are estimated based on three risk classifications (based on credit rating) and three maturity classifications.
CEO overconfidence	Binary variable that equals one if the moneyness of the vested and unexercised options held by the CEO is at least 67% in a given year. Otherwise, it equals zero.
Dividend premium	The value-weighted premium estimated by Baker & Wurgler (2004) for the fiscal month-year end. The variable is available at a monthly frequency and obtained from Jeffrey Wurgler's website at the address http://people.stern.nyu.edu/jwurgler/.

Industry propensity to overpay	The annual average value of the over-payer binary variable for firm-year observations from the same industry based on Fama-French 49 industries, excluding the firm under consideration.
PPI Change	The annual percentage change in PPI prices at the fiscal month-year end of each firm *i*.
PPI Jump	Binary variable that equals one if the annual percentage increase is larger than two standard deviations based on the annual PPI changes across the time period of this study. Otherwise, it equals zero.
PPI Sensitivity	Binary variable that equals one if the coefficient from regressing each firm's quarterly operating income after depreciation deflated by total assets against the quarterly PPI changes is significant at least at the 10% level. Otherwise, it equals zero.
State propensity to overpay	The annual average value of the over-payer binary variable for firm-year observations from firms headquartered in the same state (based on data from Compustat), excluding the firm under consideration.
Stock CAR	Stock CARs are monthly stock excess returns for a number of monthly periods surrounding the fiscal year-month end of each firm in our sample. Monthly stock returns are retrieved from CCM and excess returns are estimated using the Fama & French (2015) 5-factor model. The 5 factors are from Kenneth French's website.
Tariff cut	Binary variable that equals one if the annual percentage decrease in the import tariff rate of industry *j* in year *t* is at least twice the industry mean import tariff level and there are no comparable tariff increases in the following year *t+1*. Otherwise, it equals zero.

Δ PPE	Percentage change in plant, property, and equipment (Compustat item PPENT).
Δ Sales	Percentage change in sales (Compustat item SALE).
Δ Total assets	Percentage change in total assets (Compustat item AT).

Figure 1. Payout yields over time. The graph shows the average annual dividend, share repurchase, and total payout yields (relative to market capitalization) of US-listed firms in our sample from 1975 to 2011. All variables are defined in the appendix.

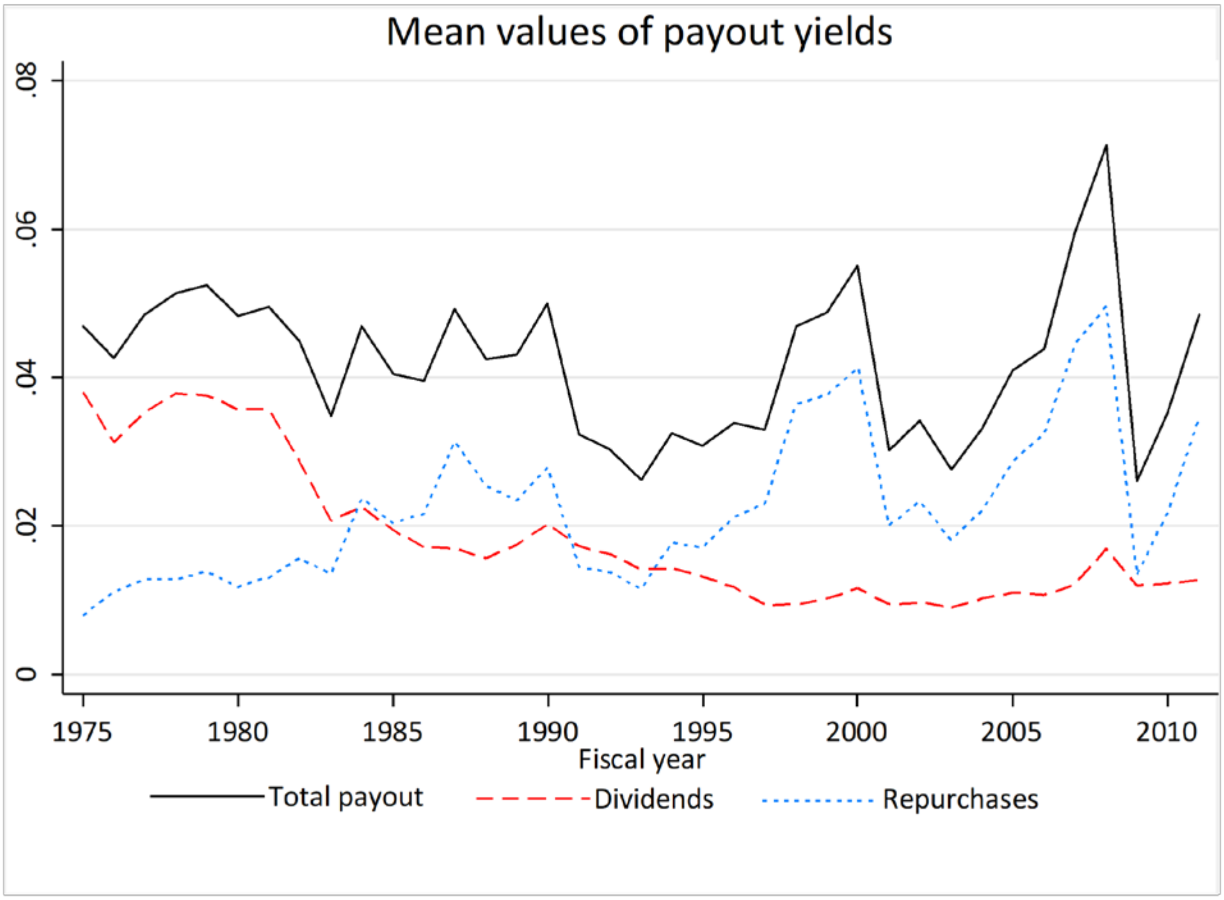

Table 1. Summary statistics

This table presents summary statistics for the sample used in this study, covering the period 1975-2011, in Panels A and B (1980-2011 for the bankruptcy variable). We exclude financial firms (SIC codes 6000-6999), utilities (SIC codes 4900-4949), and securities other than common stock. Panel A reports the total payout (measured as the sum of dividends and share repurchases) scaled by market capitalization and the variables used for identifying the expected payout estimated in Table 2. Panel B reports an array of alternative financial distress and firm survival (voluntary and involuntary delisting and bankruptcy filing) measures. Survival measures are computed over the five years following the current period (t). All non-binary variables are winsorized at the 1% and 99% tails. All variables are defined in the appendix.

Panel A. Total Payout and Payout Controls

	N	Mean	Median	St. Dev.	Min	Max
Total payout	82,425	0.022	0.001	0.041	0.000	0.254
Dividends	82,425	0.009	0.000	0.017	0.000	0.077
Repurchases	82,425	0.012	0.000	0.034	0.000	0.220
Cash flow	82,425	0.075	0.117	0.199	-0.973	0.367
Market-to-book	82,425	1.723	1.298	1.319	0.581	8.850
Firm size	82,425	4.340	4.187	2.114	0.049	9.714
Leverage	82,425	0.179	0.135	0.167	0.000	0.689
Retained earnings	82,425	-0.152	0.159	1.150	-7.075	0.795
Cash holdings	82,425	0.128	0.062	0.163	0.000	0.795
Idiosyncratic risk	82,425	0.037	0.031	0.023	0.009	0.129
Systematic risk	82,425	0.008	0.006	0.007	0.000	0.035
Firm age	82,425	15.038	11.000	14.707	1.000	86.000

Panel B. Financial Distress and Firm Survival

	N	Mean	Median	St. Dev.	Min	Max
Z-score – Dummy	82,425	0.839	1.000	0.368	0.000	1.000
Zmijewski-score	82,425	-1.163	-1.439	1.908	-4.121	7.706
O-score	82,425	-3.755	-4.132	2.689	-9.096	6.991
Distance to default	82,425	6.466	5.206	5.602	-1.705	28.078
Default probability	82,425	6.626	0.000	18.696	0.000	95.588
CHS-score	82,425	-6.948	-7.526	1.877	-9.139	1.205
Default probability (CHS)	82,425	1.890	0.054	9.591	0.011	76.946
Merger and acquisition (year +5)	82,425	0.188	0.000	0.390	0.000	1.000
Exchange transaction (year +5)	82,425	0.009	0.000	0.095	0.000	1.000
Liquidation (year +5)	82,425	0.003	0.000	0.050	0.000	1.000
Exchange dropped (year +5)	82,425	0.136	0.000	0.343	0.000	1.000
Liquidation and exchange dropped (year +5)	82,425	0.139	0.000	0.346	0.000	1.000
Bankruptcy (year +5)	76,816	0.048	0.000	0.215	0.000	1.000

Table 2. Payout Tobit model

This table presents Tobit regression results on a panel dataset of firm-year total payout and a set of established payout determinants for all US-listed firms in our sample during 1975-2011, as per the following equation:

$$Total\ payout_{i,t} = \alpha + \beta_1 Cash\ flow_{i,t} + \beta_2 Market - to - book_{i,t} + \beta_3 Firm\ size_{i,t} + \beta_4 Leverage_{i,t} + \beta_5 Retained\ earnings_{i,t} + \beta_6 Cash\ holdings_{i,t} + \beta_7 Idiosyncratic\ risk_{i,t} + \beta_8 Systematic\ risk_{i,t} + \beta_9 Firm\ age_{i,t} + u_{i,t}$$

We exclude financial firms (SIC codes 6000-6999), utilities (SIC codes 4900-4949), and securities other than common stock. All variables are defined in the appendix. The regression includes industry fixed effects, as defined using the Fama-French 49-industry classification, and year fixed effects. We use heteroskedasticity-robust standard errors clustered by firm to control for within-firm (serial) correlation. The robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Total payout
Cash flow	0.024***
	(0.003)
Market-to-book	-0.009***
	(0.000)
Firm size	0.006***
	(0.000)
Leverage	-0.001
	(0.003)
Retained earnings	0.005***
	(0.001)
Cash holdings	0.024***
	(0.003)
Idiosyncratic risk	-0.600***
	(0.030)
Systematic risk	-0.973***
	(0.066)
Firm age	0.001***
	(0.000)
Constant	0.014**
	(0.006)
Industry / Year FEs	YES
Observations	82,425

Table 3. Non-payers, under-payers, and over-payers

This table presents the average actual and expected payout yields for all US-listed firms in our sample during 1975-2011. We exclude financial firms (SIC codes 6000-6999), utilities (SIC codes 4900-4949), and securities other than common stock. Panel A reports the firm-specific characteristics and differences in means for firms that pay out in year *t* less (under-payers) or more (over-payers) than expected based on the expected (fitted) payout yield estimated from the Tobit regression as shown in Table 2. All variables are defined in the appendix. Panel B reports the average actual and expected payout yields. The payout yield is the total payout (measured as the sum of dividends and share repurchases) scaled by market capitalization. The expected payout yield is the predicted (fitted) payout yield estimated from the Tobit regression as shown in Table 2. Based on the expected payout yield we use the *mid-point classification* to identify over-payers and under-payers, which identifies firm *i* in year *t* as an over-payer if the residual $u_{i,t}$ is positive, as an under-payer if the residual $u_{i,t}$ is negative, and as a non-payer if there is no payout in year *t*. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Panel A	Under-payers *(N=25,621)*	Over-payers *(N=18,421)*	Difference in means
Cash flow	0.141	0.119	-0.022***
Market-to-book	1.613	1.451	-0.162***
Firm size	5.453	4.667	-0.786***
Leverage	0.167	0.189	0.022***
Retained earnings	0.226	0.129	-0.098***
Cash holdings	0.108	0.111	0.004***
Idiosyncratic risk	0.026	0.030	0.005***
Systematic risk	0.008	0.008	-0.001***
Firm age	20.820	17.381	-3.439***
Total payout	0.018	0.076	0.058***

Panel B	N	Mean (actual) payout yield	Mean (expected) payout yield
Under-payers	25,621	0.018	0.035
Over-payers	18,421	0.076	0.031
Non-payers	38,383	0.000	0.015

Table 4. Total payout and financial distress

This table presents the average values for a range of financial distress variables for all US-listed firms in our sample during 1975-2011. We exclude financial firms (SIC codes 6000-6999), utilities (SIC codes 4900-4949), and securities other than common stock. The average values and the differences in means are reported for each firm type based on the *mid-point classification*, which is defined in Table 3. All variables are defined in the appendix. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Non-payers (1)	Under-payers (2)	Over-payers (3)	Difference in means	
				(3) vs. (1)	(3) vs. (2)
Z-Score – Dummy	0.755	0.927	0.890	0.135***	-0.037***
Zmijewski-score	-0.727	-1.640	-1.409	-0.682***	0.232***
O-score	-2.799	-4.808	-4.282	-1.483***	0.527***
Default probability	10.271	2.249	5.117	-5.155***	2.867***
Default probability (CHS)	3.300	0.288	1.181	-2.120***	0.893***

Table 5. Total payout and firm survival

This table presents the average values for a range of voluntary (Panel A) and involuntary (Panel B) firm delisting probabilities for all US-listed firms in our sample during 1975-2011. Panel C contains the average value of a firm's probability of being involved in a bankruptcy case for the sample period of 1980-2011. We exclude financial firms (SIC codes 6000-6999), utilities (SIC codes 4900-4949), and securities other than common stock. As in Bhattacharya et al. (2015) we consider two types of delisting: voluntary and involuntary. As voluntary delistings we consider firms that are involved in (a) *mergers and acquisitions* and (b) *exchange transactions*. As involuntary delistings we consider (c) firms that are liquidated, where they are forced to cease operations and sell their assets (*liquidation*); (d) firms that are dropped from a stock exchange, for reasons other than liquidation or voluntary delisting (*exchange dropped*); and (e) a combination of firms that are liquidated or dropped from the exchange (*liquidation and exchange dropped*). We consider both Chapter 7 and Chapter 11 cases to measure the bankruptcy probability. The average values of the delisting and bankruptcy dummies and the differences in means are reported for each firm type based on the *mid-point classification,* which is defined in Table 3. All firm survival variables are defined in the appendix and are computed over the five years following the current period (*t*). ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Non-payers (1)	Under-payers (2)	Over-payers (3)	Difference in means	
				(3) vs. (1)	(3) vs. (2)
Panel A. Voluntary delisting					
Merger and acquisition (year +5)	0.188	0.186	0.189	0.002	0.003
Exchange transaction (year +5)	0.006	0.011	0.012	0.007***	0.001
Panel B. Involuntary delisting					
Liquidation (year +5)	0.002	0.002	0.003	0.001*	0.001
Exchange dropped (year +5)	0.223	0.047	0.080	-0.142***	0.033***
Liquidation and exchange dropped (year +5)	0.225	0.049	0.084	-0.142***	0.034***
Panel C. Bankruptcy					
Bankruptcy (year +5)	0.066	0.029	0.037	-0.029***	0.008***

Table 6. Logistic regression of the impact of tariff cuts on the propensity to overpay

This table presents logit regression results of the impact of tariff cuts on overpayment for a panel dataset of all US-listed firms in our sample during 1975-2011. We exclude financial firms (SIC codes 6000-6999), utilities (SIC codes 4900-4949), and securities other than common stock. The dependent variable is a binary variable that takes the value of one if firm *i* in year *t* is identified as an over-payer and zero if it is identified as an under-payer based on Equation 1 and using the *mid-point classification*, which is defined in Table 3. Firms that do not pay any dividends or repurchase shares at time *t* are excluded from the sample. The main variable of interest is *Tariff cut* which takes the value of one if a change in import tariff rates at time *t* for each industry-year observation is greater than twice the average tariff rate for each industry *j* across all years of our sample and is not followed by a tariff increase of a similar magnitude the following year *t+1*. Otherwise, *Tariff cut* takes the value of zero. *Tariff cut* is lagged by one year relative to the over-payer classification. All other variables are defined in the appendix. Firm controls include all independent variables used in Equation 1. The regressions include industry and year fixed effects. Industries are defined using the Fama-French 49-industry classification. We use heteroskedasticity-robust standard errors clustered by firm to control for within-firm (serial) correlation. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Over-payers			
	(1)	(2)	(3)	(4)
Tariff cut	-0.117**	-0.128**	-0.110**	-0.107**
	(0.051)	(0.051)	(0.051)	(0.051)
Industry propensity to overpay			1.120***	1.093***
			(0.175)	(0.175)
State propensity to overpay				0.615***
				(0.185)
Constant	-0.315	0.219	-0.294	-0.591*
	(0.285)	(0.301)	(0.315)	(0.335)
Observations	16,406	16,406	16,401	16,173
Industry / Year FE	YES	YES	YES	YES
Firm Controls	NO	YES	YES	YES
Cluster Firm Level	YES	YES	YES	YES
Pseudo R-squared	0.016	0.042	0.045	0.046

Table 7. Logistic regression of the impact of PPI changes on the propensity to overpay

This table presents logit regression results of the impact of changes in the Producer Price Index (PPI) on overpayment for a panel dataset of all US-listed firms in our sample during 1975-2011. We exclude financial firms (SIC codes 6000-6999), utilities (SIC codes 4900-4949), and securities other than common stock. The dependent variable is a binary one that takes the value of one if firm *i* in year *t* is identified as an over-payer and zero if it is identified as an under-payer based on Equation 1 and using the *mid-point* classification, which is defined in Table 3. Firms that do not pay any dividends or repurchase shares at time *t* are excluded from the sample. The main variables of interest are: *PPI Change*, which is defined as the annual percentage change in PPI prices at the fiscal month-year end for each firm *i*; *PPI Jump*, which takes the value of one when there is an annual percentage increase that is larger than two standard deviations based on the annual PPI price changes across the time period of our study, and zero otherwise; *PPI Sensitivity* is a binary variable that takes the value of one if the coefficient from regressing each firm's quarterly operating income after depreciation deflated by total assets against the quarterly changes in PPI prices is significant at least at the 10% level, and zero otherwise. All other variables are defined in the appendix. Firm controls include all independent variables used in Equation 1. The regressions include industry and year fixed effects. Industries are defined using the Fama-French 49-industry classification. We use heteroskedasticity-robust standard errors clustered by firm to control for within-firm (serial) correlation. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Over-payers											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
PPI Change	-1.794***	-1.858***	-1.765***	-1.717***								
	(0.354)	(0.372)	(0.374)	(0.378)								
PPI Jump					-0.453***	-0.495***	-0.489***	-0.488***	-0.393***	-0.423***	-0.423***	-0.420***
					(0.086)	(0.088)	(0.089)	(0.090)	(0.089)	(0.092)	(0.093)	(0.094)
PPI Jump x PPI Sensitivity									-0.246**	-0.304***	-0.278***	-0.281***
									(0.098)	(0.096)	(0.096)	(0.097)
PPI Sensitivity									-0.111***	0.087**	0.086**	0.079*
									(0.043)	(0.043)	(0.043)	(0.043)
Industry propensity to overpay			1.283***	1.271***			1.286***	1.274***			1.285***	1.271***
			(0.104)	(0.105)			(0.104)	(0.105)			(0.105)	(0.105)
State propensity to overpay				0.231**				0.231**				0.214**
				(0.108)				(0.108)				(0.108)
Constant	-0.543**	0.241	-0.214	-0.375	-0.552**	0.237	-0.215	-0.382	-0.527*	0.219	-0.231	-0.394
	(0.274)	(0.274)	(0.289)	(0.301)	(0.274)	(0.274)	(0.289)	(0.301)	(0.280)	(0.274)	(0.290)	(0.301)
Observations	44,042	44,042	44,009	43,462	44,042	44,042	44,009	43,462	43,769	43,769	43,736	43,216
Industry & Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm Controls	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Cluster Firm Level	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Pseudo R-squared	0.010	0.041	0.045	0.045	0.010	0.042	0.045	0.046	0.011	0.042	0.046	0.046

Table 8. Bond- and stock-holder reaction to overpayment.

This table presents linear (OLS) regression results of the impact of overpaying on bond and stock abnormal returns of all US-listed firms in our sample during 1994-2011. We exclude financial firms (SIC codes 6000-6999), utilities (SIC codes 4900-4949), and securities other than common stock. The dependent variable is the cumulative abnormal return (CAR) for bonds and stocks respectively, across different time windows. Bond CAR are the monthly excess bond returns as in Campello et al. (2018) estimated relative to the fiscal month-year end for each firm *i*. Stock CAR are monthly excess stock returns estimated based on the Fama and French (2015) 5-factor model, relative to the fiscal month-year end for each firm *i*. The main variable of interest is *Over-payer*, which is a binary variable that takes the value of one if firm *i* in year *t* is identified as an over-payer and zero if it is identified as an under-payer based on Equation 1 and using the *mid-point* classification, which is defined in Table 3. Firms that do not pay any dividends or repurchase shares at time *t* are excluded from the sample. The regressions include industry and year fixed effects. Industries are defined using the Fama-French 49-industry classification. We use heteroskedasticity-robust standard errors clustered by firm and year to control for within- and across-firm correlation. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Bond						Stock					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	$CAR_{(-1,+1)}$	$CAR_{(-2,+2)}$	$CAR_{(-3,+3)}$	$CAR_{(-4,+4)}$	$CAR_{(-5,+5)}$	$CAR_{(-6,+6)}$	$CAR_{(-1,+1)}$	$CAR_{(-2,+2)}$	$CAR_{(-3,+3)}$	$CAR_{(-4,+4)}$	$CAR_{(-5,+5)}$	$CAR_{(-6,+6)}$
Over-payer	-0.499*	-0.856*	-1.150***	-0.926***	-0.824***	-1.043*	-1.710*	-3.195**	-4.130***	-3.279***	-3.006***	-3.561**
	(0.254)	(0.412)	(0.293)	(0.293)	(0.279)	(0.495)	(0.980)	(1.168)	(0.847)	(1.131)	(0.841)	(1.397)
Constant	0.152*	0.232*	0.569***	0.605***	1.011***	1.291***	-1.137***	-1.261***	-1.472***	-0.838***	-1.459***	-3.099***
	(0.075)	(0.133)	(0.076)	(0.087)	(0.077)	(0.144)	(0.292)	(0.311)	(0.130)	(0.227)	(0.123)	(0.334)
Observations	1,857	1,800	1,744	1,674	1,569	1,508	1,975	1,976	1,976	1,976	1,976	1,976
R-squared	0.020	0.076	0.055	0.061	0.056	0.044	0.042	0.054	0.042	0.028	0.029	0.039
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm & Year Cluster	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 9. CEO overconfidence and catering channels of overpayment.

This table presents logit regression results of the impact of CEO overconfidence and dividend premium on overpayment for a panel dataset of all US-listed firms in our sample during 1992-2011 for models (1)-(4) and 1975-2011 for models (5)-(8). We exclude financial firms (SIC codes 6000-6999), utilities (SIC codes 4900-4949), and securities other than common stock. The dependent variable is a binary one that takes the value of one if firm *i* in year *t* is identified as an over-payer and zero if it is identified as an under-payer based on Equation 1 and using the *mid-point* classification, which is defined in Table 3. Firms that do not pay any dividends or repurchase shares at time *t* are excluded from the sample. The main variables of interest are *CEO overconfidence* which takes the value of one if the moneyness of the vested and unexercised options held by the CEO of firm *i* in year *t* is at least 67% and zero otherwise; *Dividend premium*, which is the value-weighted premium estimated by Baker & Wurgler (2004) for the fiscal month-year end. The variable is available at a monthly frequency and obtained from Jeffrey Wurgler's website at the address http://people.stern.nyu.edu/jwurgler/. All other variables are defined in the appendix. Firm controls include all independent variables used in Equation 1. The regressions include industry and year fixed effects. Industries are defined using the Fama-French 49-industry classification. We use heteroskedasticity-robust standard errors clustered by firm to control for within-firm (serial) correlation. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Over-payers							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CEO overconfidence	-0.536***	-0.673***	-0.662***	-0.675***				
	(0.056)	(0.059)	(0.060)	(0.060)				
Dividend premium					0.011***	0.011***	0.010***	0.010***
					(0.002)	(0.002)	(0.002)	(0.002)
Industry propensity to overpay			1.017***	0.989***			1.285***	1.272***
			(0.218)	(0.220)			(0.104)	(0.105)
State propensity to overpay				-0.078				0.229**
				(0.211)				(0.108)
Constant	-1.623***	-0.824**	-1.091***	-1.085***	-0.848***	-0.070	-0.513*	-0.667**
	(0.389)	(0.401)	(0.411)	(0.421)	(0.276)	(0.276)	(0.291)	(0.304)
Observations	11,449	11,449	11,437	11,294	44,042	44,042	44,009	43,462
Industry & Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Firm Controls	NO	YES	YES	YES	NO	YES	YES	YES
Cluster Firm Level	YES	YES	YES	YES	YES	YES	YES	YES
Pseudo R-squared	0.010	0.041	0.045	0.045	0.010	0.041	0.045	0.045