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. Exogenous import tariff reductions, which increase product market competition and impact negatively on cash flows, reduce the likelihood of overpayment. We interpret this as evidence consistent with a financial flexibility channel explaining the relation between excessive payouts and financial distress, rather than a risk-shifting mechanism. Our finding of a positive association between excessive payouts and financial distress risk is robust to using different definitions of overpayment and financial distress, various empirical specifications and tests mitigating the impact of confounding effects.

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 in the US, which reached an all-time high of $1.25tn in 2017, 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 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[3] 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*).

[1] See for example "Global dividends hit record of $1.25 trillion in 2017, more to come." – Masoni, Reuters (February 19, 2018); "The amount of cash corporate America is dishing to investors sends a scary signal about the stock market's future" – Udland (2016).

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

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

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.[4] 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. 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.

[4] 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).

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. 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 this 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 use 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), and 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, 2017; 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.[5] 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 and 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. Our results corroborate the findings of Chen and Wang (2012), who find that financially constrained firms that repurchase shares reduce their investments.

We acknowledge our results may be sensitive to the possible misclassification of over-payers and potential confounding effects driving the relation between overpayment and financial distress. We address these problems using a series of robustness tests. To avoid misclassifying over-payers we rely on alternative definitions of them, and our results are qualitatively similar. We also use a range of distress risk measures to account for the confounding effects that could potentially affect the reported relation between overpayment and distress risk, and our results hold. These measures

[5] In our study, we intentionally focus on firms that may purposely overpay or underpay. Since non-payers are inherently different from payers (DeAngelo et al., 2006; Fama & French, 2001) and are characterized by low profitability and retained earnings, they may be constrained in their payout choices owing to binding legal and/or contractual constraints such as covenants. Non-payers also have more valuable growth opportunities than payers, making them less likely to engage in risk-shifting activities. Finally, in our estimations, a non-payer would be mechanically classified as an under-payer, since the expected payout for a non-payer is always positive. Thus, we exclude non-payers from this part of the analysis.

are bound to be affected differently by omitted characteristics, therefore, the fact that we obtain consistent results across these different specifications reduces the probability that some common omitted factor is driving the relation. Furthermore, we run a covariate matching of over-payers with under-payers, along with a sensitivity analysis of the potential impact of unobserved bias on our covariate matching (Rosenbaum, 2002) to alleviate concerns about omitted covariate bias, and our results remain unchanged.

We use large tariff cuts as a quasi-natural experiment to disentangle the *reduced-flexibility* hypothesis from the *risk-shifting* hypothesis. Previous evidence shows that increased product market competition causes firms to reduce payouts (Hoberg, Phillips, & Prabhala, 2014). Import tariff reductions reduce the barriers against foreign firms entering the US market, thus lowering the domestic profit margins due to increased competition (Bernard, Jensen, & Schott, 2006) and increasing the attractiveness of having cash on hand (Frésard, 2010). If overpayment is driven by *risk-shifting*, in the event of a tariff cut shock 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 due to tariff cuts, they will become less likely to over-pay based on the *reduced-flexibility* hypothesis. Our results show that large import tariff cuts reduce the likelihood of overpayment, which does not support the risk-shifting hypothesis. Instead, we argue that this finding is more aligned with the reduced-flexibility hypothesis. The shock to cash flows driven by large tariff cuts seems to impose discipline on managers that engage in overpayment and lead them to adjust their payout policy downwards in order to cope with the lower current and expected future cash flows. Obviously, this finding does not preclude managers from acting in a way that is consistent with the predictions of the reduced-flexibility hypothesis during normal times.

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-

[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).

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 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%

[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.

[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.

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, 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 and 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 and Purnanandam (2010) and Anantharaman and 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.

[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.

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, that is, 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% 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, as briefly explained in footnote 5. 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, the 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.

The 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 datamining 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 in footnote 6, market capitalization is affected by stock market fluctuations that could, rather than deliberate choices over payout policy, drive our findings.[10] In untabulated robustness tests, following Michaely and Qian (2017), we repeat all our analyses by requiring instead that a firm be classified as an over-payer (under-payer) in a particular year if it makes total payouts that are larger (smaller) than expected based on a similar model for total payout but in this case scaled 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

[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 deliberately increase their payouts, and their classification as over-payers is not primarily due to changes in market capitalization.

we replace total payout with dividends or repurchases in Model (1). We also replicate the analysis of this model with one-year-lagged control variables 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 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. 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 (*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 an alternative classification method that is based on terciles (*tercile classification*). In particular, 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.

A firm may pay more than expected only once, either by miscalculation or deliberately; however, we wish to identify deliberate over-payers. Therefore, we further ensure our results are robust and not driven by possible misclassification, by classifying our sample firms based on the consistency of their 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: consistent non-payers, consistent under-payers, consistent 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).

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.[11]

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 & 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,

[11] See, for example, “The problem with buybacks, Dell edition” – Salmon (2012).

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, moderate/unclassified-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, especially under the *tercile classification* in which the payout yield of the average under-payer is less than half its expected payout. 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.[12] We investigate our conjecture below.

Table 4 reports the results from the univariate analysis of several financial distress measures across different classifications of firms: non-payers, moderate/unclassified 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]

[12] 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.

The results for the *mid-point classification* show that, 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%). The same findings apply when classifying firms into terciles and when using the *persistent classification*. 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 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, and 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*). In Section 6 below, we attempt to disentangle these two not mutually exclusive hypotheses with a quasi-natural experiment.

5. Covariate matching tests

A potential weakness of the univariate tests in the previous section stems from the fact that over-payers are inherently different from under-payers, as reported in Panel A of Table 3, and these differences may drive the relation between overpayment and distress. In particular, the residual from Model (1) is a function of both the actual and the expected payout, with the latter variable reflecting firm characteristics that may also be associated with financial distress. To control for differences in observables that could bias our findings, we match each observation for an over-payer (treated observation) with a suitable observation for an under-payer (untreated observation).

We use the *mid-point classification* as this allows for a larger sample size and time-variant shift from overpaying to underpaying. Nevertheless, the results based on the other two classifications, i.e., terciles and persistent, are qualitatively similar. We exclude from the sample of untreated observations those firm-years with zero total payout. We match each firm-year observation identified as an over-payer with an under-payer by using the one-to-one nearest-neighbor covariate matching method with replacement, based on the expected level of payout as the matching variable. Alternatively, we repeat the matching process based on the similarity of the firm-specific characteristics (all controls), relying on the non-binary independent variables from Table 2. Since payers are inherently different from non-payers (DeAngelo et al., 2006; Fama & French, 2001), we match our treatment and control firms based on observable information available in the capital markets but conditional on these firms making a payout. Therefore, and similarly to the argument made by von Eije, Goyal, & Muckley (2014), our matched control firms have *ex ante* the same likelihood of overpaying as the firms that *actually* overpay and vice versa. Given that our treatment and control firms are virtually indistinguishable in terms of observable characteristics, we argue that significant differences in financial distress and firm survival between over-payers and under-payers after matching could be associated with the treatment effect, i.e., overpayment.

The results in Table 6 show there is a significant reduction in bias[13] owing to the matching procedure, indicating that the matching technique we use is particularly successful in reducing the differences in observable firm characteristics between the two samples of treated and untreated observations. The bias after matching is 0.000 when matched based on the expected payout (Panel A) and 2.284 or lower based on all controls (Panel B). Thus, in all cases the absolute bias after matching is well below the recommended threshold (i.e., 5). Moreover, except for *Bankruptcy (year +5)* in both Panel A and Panel B, the results show that the treatment effect of overpaying

[13] We rely on the Stata user command psmatch2 to produce our covariate matching estimations and statistics on the bias before and after matching.

has a consistent and positive effect on financial distress and the likelihood of a stock being forcibly delisted from a stock exchange.

Still, the reported average treatment effects could be affected by hidden bias due to unobservable characteristics. Therefore, we assess the sensitivity to hidden bias of our treatment effect (over-payers) on the outcome (financial distress) by employing the Rosenbaum bounds[14] (Rosenbaum, 2002, 2005, 2010) which are denoted by the parameter Γ, a measure of relative odds of treatment or control (Rosenbaum, 2002). Γ=1 assumes there is no hidden bias and that firms have equal odds of being assigned to the treatment and control groups. When Γ is higher than 1, firms have unequal probabilities of being assigned to the treatment and control groups (i.e., over-payers and under-payers), suggesting there is hidden bias. By relaxing the assumption of Γ=1, it is possible to estimate the extent to which hidden bias might affect the model estimates by increasing the level of Γ (Rosenbaum, 2002). As a result, smaller values of Γ indicate that the findings have greater sensitivity to hidden bias. In contrast, higher values of Γ indicate that the results have lower sensitivity to hidden bias, and are therefore more robust estimates. For instance, when Γ=2 it means that a matched control firm is twice as likely to receive the treatment due to hidden bias.[15]

The last column of Table 6 reports the Γ values of the Rosenbaum bounds at the 90% confidence level. The results show that, after matching treated and untreated firms based on their firm-specific characteristics, the impact of overpayment on *Bankruptcy (year +5)* is sensitive to

[14] We rely on the Stata user commands rbounds (Gangl, 2004) for continuous outcomes and mhbounds (Becker & Caliendo, 2007) for binary outcomes.

[15] It should be noted that the Rosenbaum bounds sensitivity tests are inherently very strict. This is because they assume a near perfect and almost deterministic relation between the unobservable covariate(s) (hidden bias) and the outcome, in our case financial distress.

hidden bias, with Γ values of 1.04 and 1.00 in Panels A and B respectively, although the treatment does not have a statistical effect in the first place. However, the results for the remaining measures of financial distress are more robust, as they are broadly less sensitive to hidden bias. For instance, the Γ value for *Default probability (CHS)* is 1.63, suggesting that the treatment effect of overpaying on this variable would become statistically insignificant if an unobserved covariate could alter the likelihood of an untreated firm becoming a treated firm by approximately 63% (or 1.63 times), resulting in a shift in the log odds ratio of 61.77%/37.90% (=1.63). Similarly, the Γ values for *O-score* show that the hidden bias would need to shift the probability of an untreated firm being classified as a treated firm by 26% (or 1.26 times) in order to invalidate the statistical significance of overpayment on *O-score*. Overall, this non-parametric quasi-experimental analysis shows that overpayment is associated with higher financial distress and risk of involuntary delisting, and these findings are not likely to be driven by hidden bias due to unobservable characteristics.

[Insert Table 6 about here]

6. Reduced flexibility vs risk-shifting: Quasi-natural experiment and falsification tests

In this section we disentangle the effect of *reduced flexibility* from *risk-shifting*. We do so by using a quasi-natural experiment in the form of 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). Therefore, large reductions in import tariffs act as exogenous shocks to firms' payout policies and, if *risk-shifting* is the channel for overpayment, then tariff cuts should be positively related to overpayment.

In order to estimate cuts in import tariffs, we follow Frésard (2010), Valta (2012), and Frésard and 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)[16], 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, Shenoy, & Subramaniam (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. In alternative specifications, instances where import tariffs drop significantly but are smaller than 1%, are not treated as tariff shocks and we exclude tariff changes that occur between 1988 and 1989, due to the change in the coding of imports. Our results (untabulated) based on these alternative specifications remain qualitatively the same. Overall, in our sample of overpayers and underpayers 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 7 reports the results on the impact of a significant tariff reduction (*Tariff shock*) on the likelihood of overpaying. Note that *Tariff shock* is measured with a one-year lag relative to overpaying. For the *risk-shifting hypothesis* to hold, we would expect to find a positive relation between a tariff shock and the overpayment likelihood, consistent with firms accelerating the wealth transfer from creditors to shareholders. However, our results show that a tariff shock leads

[16] 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).

to a reduction in the likelihood of a firm becoming an over-payer, which is consistent across all three types of over-payer classification.

We note that a tariff cut can create an economic shock leading to a decrease in the expected payout level through its impact on firm characteristics which determine the payout level. This implies that a lower payout following the tariff cut may not necessarily translate into a lower likelihood to overpay. However, this alternative explanation is not likely to be driving our results for primarily three reasons. First, our baseline results that identify a firm as over-payer or under-payer are based on a long-time horizon of more than 40 years which would account for transient changes in expected payout. Second, these results are consistent with the ones produced by the analysis based on persistent over-payers, i.e., firms that overpay over three consecutive years. Third, we replicate our estimations based on 1- and 5-year windows for estimating the expected payout and our results hold (untabulated).

A firm's payout policy is also influenced by its peers (Grennan, 2018), its geographic location (John, Knyazeva, & Knyazeva, 2011; Ucar, 2016), and local shareholder clientele (Becker, Ivković, & Weisbenner, 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* and alternatively *City 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 7 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 shocks 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. These findings are arguably consistent with the *financial-flexibility hypothesis* and completely at odds with a *risk-shifting* explanation. 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.

[Insert Table 8 about here]

Finally, following Kini et al. (2016), we run a set of falsification tests on the direction of the effect financial distress has on the likelihood of overpaying. Table 8 reports the results of lagged, contemporaneous, and leading financial distress measures on the likelihood of overpaying. If financial distress and risk-shifting caused firms to overpay, we would expect to find that only the lagged or contemporaneous financial distress were positively related to the likelihood of becoming an over-payer. Alternatively, if lead distress is significantly related with current overpayment, this would indicate reverse causality between distress and overpayment. In which case risk-shifting would not be supported. Our results show that across most financial distress measures, the leading financial distress increases the likelihood of overpaying. The indication of reverse-causality between distress and overpayment does not support risk-shifting. Therefore, our results corroborate our earlier findings that firms do not necessarily overpay for risk-shifting purposes.

7. Real effects of overpaying

What are the real effects of overpayment, on firms' investment decisions and future growth? Table 9 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.

[Insert Table 9 about here]

8. 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 and are more likely to involuntarily delist and more likely to be involved in a bankruptcy case. We also show that over-payers experience lower future sales and assets growth than under-payers.

We argue that our findings could be explained by two not mutually exclusive channels, which could create feedback effects. Specifically, the *reduced financial flexibility hypothesis* suggests that excessive payout policies lead to a significant reduction in liquid assets, which reduces financial flexibility and increases financial distress risk. The *risk-shifting hypothesis*, meanwhile, contends that financially distressed firms have an incentive to transfer wealth from creditors to shareholders in the form of excessive payouts. Our evidence is primarily consistent with the financial flexibility channel driving our results.

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 and 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**
Tariff shock	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.
City propensity to overpay	The annual average value of the over-payer binary variable for firm-year observations from firms headquartered in the same city (based on data from Compustat), excluding the firm under consideration.
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.
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.

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).

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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.

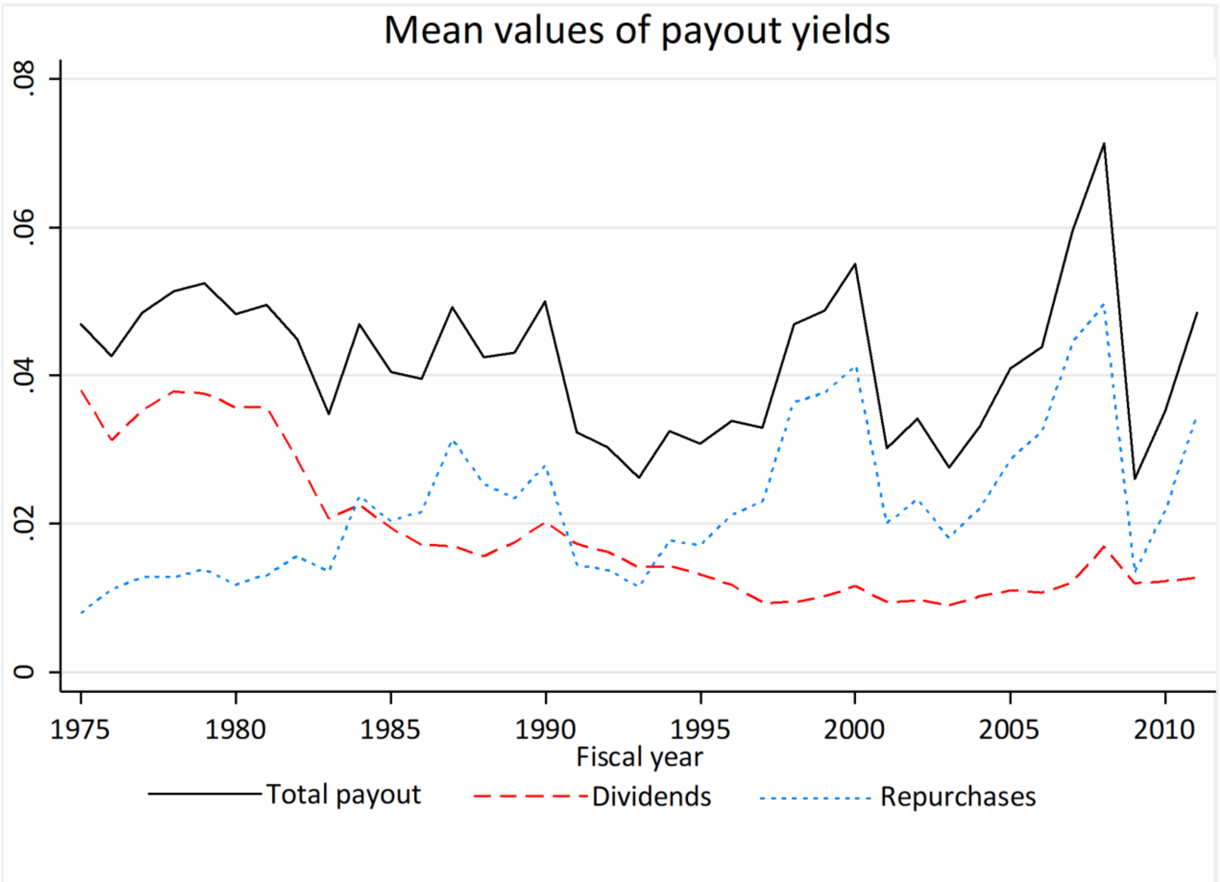

Table 1. Summary statistics

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 models

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 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, moderate payers, and over-payers

This table presents the average actual and expected payout yields for all US-listed firms 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 three alternative classifications to identify over-payers and under-payers. The *mid-point classification* 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*. The *tercile classification* identifies firm *i* in year *t* as an over-payer if the residual $u_{i,t}$ is in the top tercile, as a moderate payer if the residual $u_{i,t}$ is in the middle tercile, as an under-payer if the residual $u_{i,t}$ is in the lower tercile, and as a non-payer if there is no payout in year *t*. The *persistent classification* identifies firm *i* in year *t* as an over-payer if the residual $u_{i,t}$ is positive over three consecutive years, as an under-payer if the residual $u_{i,t}$ is negative over three consecutive years, and as a non-payer if there is no payout over three consecutive years, and all other payers are labelled as unclassified. ***, **, 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
Mid-point classification			
Under-payers	25,621	0.018	0.035
Over-payers	18,421	0.076	0.031
Non-payers	38,383	0.000	0.015
Tercile classification			
Under-payers	14,681	0.015	0.040
Moderate payers	14,681	0.024	0.028
Over-payers	14,680	0.087	0.031
Non-payers	38,383	0.000	0.015
Persistent classification			
Under-payers	8,408	0.020	0.040
Unclassified payers	22,103	0.033	0.028
Over-payers	4,300	0.075	0.033
Non-payers	15,021	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 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 three alternative classifications: *mid-point*, *tercile*, and *persistent*. These classifications are 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)	Moderate/ Unclassified payers (3)	Over-payers (4)	Difference in means	
					(4) vs. (1)	(4) vs. (2)
Z-Score – Dummy						
Mid-point	0.755	0.927	-	0.890	0.135***	-0.037***
Tercile	0.755	0.939	0.909	0.887	0.132***	-0.052***
Persistent	0.753	0.947	0.871	0.924	0.172***	-0.023***
Zmijewski-score						
Mid-point	-0.727	-1.640	-	-1.409	-0.682***	0.232***
Tercile	-0.727	-1.662	-1.561	-1.407	-0.680***	0.255***
Persistent	-0.765	-1.712	-1.338	-1.453	-0.688***	0.259***
O-score						
Mid-point	-2.799	-4.808	-	-4.282	-1.483***	0.527***
Tercile	-2.799	-5.018	-4.454	-4.292	-1.493***	0.726***
Persistent	-2.978	-5.143	-4.203	-4.418	-1.441***	0.725***
Default probability						
Mid-point	10.271	2.249	-	5.117	-5.155***	2.867***
Tercile	10.271	1.571	3.311	5.464	-4.808***	3.892***
Persistent	10.377	1.484	5.990	3.398	-6.979***	1.914***
Default probability (CHS)						
Mid-point	3.300	0.288	-	1.181	-2.120***	0.893***
Tercile	3.300	0.114	0.698	1.172	-2.128***	1.058***
Persistent	2.894	0.127	1.146	0.525	-2.369***	0.398***

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 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 three alternative classifications: *mid-point*, *tercile*, and *persistent*. These classifications are 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)	Moderate/ Unclassified payers (3)	Over-payers (4)	Difference in means	
					(4) vs. (1)	(4) vs. (2)
Panel A. Voluntary delisting						
Merger and acquisition (year +5)						
Mid-point	0.188	0.186	-	0.189	0.002	0.003
Tercile	0.188	0.183	0.188	0.191	0.003	0.008*
Persistent	0.190	0.165	0.195	0.182	-0.009	0.017**
Exchange transaction (year +5)						
Mid-point	0.006	0.011	-	0.012	0.007***	0.001
Tercile	0.006	0.011	0.013	0.011	0.006	0.000
Persistent	0.005	0.012	0.009	0.015	0.010	0.003
Panel B. Involuntary delisting						
Liquidation (year +5)						
Mid-point	0.002	0.002	-	0.003	0.001*	0.001
Tercile	0.002	0.002	0.003	0.003	0.001	0.001
Persistent	0.001	0.002	0.002	0.001	0.000	-0.001
Exchange dropped (year +5)						
Mid-point	0.223	0.047	-	0.080	-0.142***	0.033***
Tercile	0.223	0.032	0.070	0.081	-0.142***	0.049***
Persistent	0.201	0.023	0.095	0.051	-0.149***	0.029***
Liquidation and exchange dropped (year +5)						
Mid-point	0.225	0.049	-	0.084	-0.142***	0.034***
Tercile	0.225	0.034	0.073	0.084	-0.141***	0.049***
Persistent	0.202	0.025	0.097	0.053	-0.150***	0.028***

Panel C. Bankruptcy						
Bankruptcy (year +5)						
Mid-point	0.066	0.029	-	0.037	-0.029***	0.008***
Tercile	0.066	0.027	0.032	0.038	-0.027***	0.012***
Persistent	0.065	0.019	0.048	0.029	-0.036***	0.010***

Table 6. Covariate matching

This table reports the results on the average treatment effect on the treated (ATT) for an array of financial distress variables, an involuntary delisting measure, and a bankruptcy variable, for all US-listed firms during 1975-2011. Both the delisting and bankruptcy measures are computed over the five years following the current period (t). We exclude financial firms (SIC codes 6000-6999), utilities (SIC codes 4900-4949), and securities other than common stock. The *mid-point classification* (see Table 3) is used to match each firm-year observation of an over-payer (treated) with a suitable under-payer (untreated), by means of the one-to-one nearest-neighbor covariate matching method with replacement. Non-payers are excluded from the matching process. Γ indicates the level of hidden bias, based on the Rosenbaum bounds (Rosenbaum, 2002), that is required to invalidate the statistical significance (at the 90% confidence level) of the treatment effect on the outcome. Panel A reports the results of matching treated and untreated firms based on the expected level of payout. Panel B reports the results of matching treated and untreated firms based on the similarity of the firm-specific characteristics (all controls), relying on the non-binary independent variables of the Tobit regression as shown in Table 2. All variables are defined in the appendix. t-statistics are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Panel A. Expected only	No of treated	Bias before	Bias after	ATT	t-stat	Γ
Z-Score – Dummy	18,421	23.457	0.000	-0.025***	(-6.564)	1.41
Zmijewski-score	18,421	23.457	0.000	0.134***	(7.123)	1.13
O-score	18,421	23.457	0.000	0.298***	(11.136)	1.29
Default probability	18,421	23.457	0.000	2.033***	(11.317)	1.38
Default probability (CHS)	18,421	23.457	0.000	0.734***	(10.592)	1.57
Liquidation and exchange dropped (year +5)	18,421	23.457	0.000	0.018***	(5.302)	1.41
Bankruptcy (year +5)	16,615	21.732	0.000	0.001	(0.303)	1.04

Panel B. All controls	No of treated	Bias before	Bias after	ATT	t-stat	Γ
Z-Score – Dummy	18,421	17.891	2.268	-0.019***	(-4.906)	1.29
Zmijewski-score	18,421	17.891	2.268	0.129***	(7.059)	1.19
O-score	18,421	17.891	2.268	0.186***	(7.111)	1.26
Default probability	18,421	17.891	2.268	1.410***	(7.519)	1.28
Default probability (CHS)	18,421	17.891	2.268	0.712***	(10.256)	1.63
Liquidation and exchange dropped (year +5)	18,421	17.891	2.268	0.013***	(3.903)	1.32
Bankruptcy (year +5)	16,615	16.848	2.284	0.001	(0.233)	1.00

Table 7. 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 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 following three alternative classifications: *mid-point*, *tercile*, and *persistent*. These classifications are 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 shock* 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 shock* takes the value of zero. *Tariff shock* is lagged by one year relative to the overpayer 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 *Mid-point classification*					**Over-payers** *Tercile classification*					**Over-payers** *Persistent classification*				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Tariff shock	-0.092*	-0.112**	-0.108**	-0.101*	-0.109*	-0.209***	-0.247***	-0.214***	-0.199***	-0.214**	-0.227**	-0.281**	-0.294**	-0.295**	-0.406**
	(0.052)	(0.052)	(0.052)	(0.053)	(0.065)	(0.065)	(0.068)	(0.068)	(0.069)	(0.089)	(0.109)	(0.114)	(0.115)	(0.117)	(0.191)
Industry propensity to overpay			1.132***	1.104***	1.265***			1.565***	1.545***	1.585***			0.588*	0.542*	1.169**
			(0.175	(0.176)	(0.216)			(0.178)	(0.179)	(0.234)			(0.311)	(0.313)	(0.523)
State propensity to overpay				0.615***					0.833***					0.631**	
				(0.185)					(0.209)					(0.301)	
City propensity to overpay					0.104					0.282***					0.011
					(0.079)					(0.107)					(0.255)
Constant	-0.322	0.210	-0.304	-0.602*	-0.442	0.012	0.464	-0.322	-0.737*	-0.320	-1.312**	0.471	0.362	0.023	2.059
	(0.286)	(0.302)	(0.315)	(0.336)	(0.474)	(0.359)	(0.382)	(0.397)	(0.427)	(0.584)	(0.628)	(0.734)	(0.742)	(0.797)	(1.306)
Firm controls	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Industry / Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,404	16,404	16,399	16,171	10,482	10,534	10,534	10,515	10,339	6,119	4,977	4,977	4,923	4,794	2,277
Pseudo R-squared	0.016	0.042	0.045	0.046	0.050	0.047	0.126	0.133	0.136	0.148	0.043	0.128	0.127	0.129	0.162

Table 8. Falsification test of reverse causality by including leading distress measures

This table presents logit regression results on 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 the *mid-point classification* (see Table 3). The independent variables are a set of financial distress measures. All variables are defined in the appendix. 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.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dummy Z-score *(t-1)*		0.310***								
		(0.073)								
Dummy Z-score *(t)*	-0.320***	-0.458***								
	(0.055)	(0.063)								
Dummy Z-score *(t+1)*	-0.121**	-0.142**								
	(0.052)	(0.060)								
Zmijewski-score *(t-1)*				-0.367***						
				(0.024)						
Zmijewski-score *(t)*			0.024	0.263***						
			(0.015)	(0.023)						
Zmijewski-score *(t+1)*			0.098***	0.149***						
			(0.013)	(0.017)						
O-score *(t-1)*						-0.239***				
						(0.015)				
O-score *(t)*					0.066***	0.209***				
					(0.010)	(0.014)				
O-score *(t+1)*					0.092***	0.143***				
					(0.009)	(0.012)				
Default probability *(t-1)*								0.000		
								(0.001)		
Default probability *(t)*							0.015***	0.015***		
							(0.001)	(0.001)		
Default probability *(t+1)*							0.001	0.001		
							(0.001)	(0.001)		

Default probability (CHS) *(t-1)*										0.002
										(0.004)
Default probability (CHS) *(t)*									0.036***	0.038***
									(0.005)	(0.006)
Default probability (CHS) *(t+1)*									0.010***	0.009***
									(0.002)	(0.002)
Constant	-0.249	-1.019***	-0.386	-1.199***	0.183	-0.673**	-0.647**	-1.283***	-0.635**	-1.277***
	(0.303)	(0.321)	(0.305)	(0.315)	(0.312)	(0.325)	(0.304)	(0.317)	(0.304)	(0.318)
Industry / Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	35,175	28,820	35,175	28,820	35,175	28,820	35,175	28,820	35,175	28,820
Pseudo R2	0.0124	0.0141	0.0146	0.0262	0.0231	0.0341	0.0162	0.0177	0.0139	0.0152

Table 9. Real effects of overpayment

This table presents the changes in growth (total assets, sales, and property plant and equipment - PPE) for all US-listed firms during 1975-2011. We exclude financial firms (SIC codes 6000-6999), utilities (SIC codes 4900-4949), and securities other than common stock. Firms are categorized as non-payers, under-payers or over-payers based on the *mid-point classification* (see Table 3). Panel A reports the average change in growth from one year ahead (year+1) to five years ahead (year+5) for each of the three groups (i.e., non-payers, under-payers, and over-payers) for several variables used as proxies for firm growth. Panel B reports the differences between the under-payers' and over-payers' changes. All variables are defined in the appendix. t-statistics are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Panel A.	**Non-payers**					**Under-payers**					**Over-payers**				
	Year +1	**Year +2**	**Year +3**	**Year +4**	**Year +5**	**Year +1**	**Year +2**	**Year +3**	**Year +4**	**Year +5**	**Year +1**	**Year +2**	**Year +3**	**Year +4**	**Year +5**
Δ Total assets	13.19	12.38	11.89	11.32	10.80	12.49	10.98	9.98	9.01	8.58	7.12	7.44	7.44	7.34	7.62
Δ Sales	17.71	14.30	12.81	12.06	11.61	12.19	9.98	9.21	8.24	7.69	7.08	7.65	7.23	6.70	6.63
Δ PPE	13.78	12.41	12.12	11.81	11.66	12.93	11.13	9.66	8.57	7.82	7.52	6.83	6.75	6.47	6.79

Panel B.	**Differences in means: Over-payers vs Under-payers**				
	Year +1	**Year +2**	**Year +3**	**Year +4**	**Year +5**
Δ Total assets	-5.363***	-3.545***	-2.534***	-1.665***	-0.954***
	(-19.78)	(-12.96)	(-9.14)	(-6.02)	(-3.32)
Δ Sales	-5.107***	-2.335***	-1.983***	-1.546***	-1.061***
	(-19.41)	(-9.14)	(-7.75)	(-6.06)	(-4.03)
Δ PPE	-5.413***	-4.299***	-2.913***	-2.108***	-1.034***
	(-16.20)	(-12.91)	(-8.77)	(-6.37)	(-3.05)