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ABSTRACT

The annual inflation-adjusted amount paid out through dividends and repurchases by public industrial firms is three times larger from 2000 to 2018 than from 1971 to 1999. We find that 38% of the increase in aggregate annual payouts is explained by an increase in aggregate corporate income and 62% by an increase in the aggregate payout rate. At the firm level, changes in firm characteristics explain 71%(49%) of the increase in the average payout rate for the population (firms with payouts). Consistent with management having stronger payout incentives, payouts are more responsive to firm characteristics in the 2000s than before.

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At the turn of the century, financial economists worried about "disappearing dividends" (Fama and French, 2001). Times have changed. In recent years, the media and politicians have been increasingly concerned about the magnitude of corporate payouts. These concerns are primarily focused on the size of stock buybacks rather than dividend payments. For example, Senator Marco Rubio complains that "At present, Wall Street rewards companies for engaging in stock buybacks, temporarily increasing their stock prices at the expense of productive investment" and suggests taxing repurchases.[1] Senators Chuck Schumer and Bernie Sanders want to restrict repurchases because they are a form "corporate self-indulgence." Like Rubio, they suggest that "So focused on shareholder value, companies, rather than investing in ways to make their businesses more resilient or their workers more productive, have been dedicating ever larger shares of their profits to dividends and corporate share repurchases."[2] Academics have also expressed concern that the growth of repurchases has contributed to a decrease in capital expenditures among firms (Almeida, Fos, and Kronlund, 2016; Gutierrez and Philippon, 2017).

In this paper, we investigate why payouts are so high in the 2000s, before the COVID-19 crisis. We gather data on payouts and firm characteristics from 1971 to 2018 for industrial firms listed on U.S. exchanges. We include repurchases in payouts, but recognize that repurchases and dividends differ in an important way, namely that repurchases return capital to shareholders and decrease the number of shares outstanding. To adjust for inflation, we examine real dollar amounts using the price level in 2017. Not surprisingly, we find that payouts from 2000 to 2017 are large. The companies in our sample pay out almost $10 trillion from 2000 to 2017 – gross payouts are $10,823 billion and net payouts, which net out equity issues by repurchasing firms, are $9,862 billion. In the 2000s, annual aggregate real payouts average roughly three times their pre-2000 level. Aggregate net payouts as a percentage of aggregate corporate assets also increase substantially, averaging 2.7% from 1971 to 1999 versus 4.1% from 2000 to 2017. When we examine the ratio of aggregate net payouts to aggregate operating income, we see a similar increase; the average ratio increases from 18.9% to 32.4%. The year 2018 is expected to stand out, as it is the first year

[1] "America needs to restore dignity of work," by Marco Rubio, The Atlantic, December 13, 2018.
[2] "Limit corporate buybacks," by Chuck Schumer and Bernie Sanders, New York Times, February 3, 2019.

that corporations can take advantage of the 2017 Tax Cuts and Jobs Act (TCJA); therefore, we treat it separately. In that year, aggregate net payouts as a percentage of aggregate corporate assets are 6.2% and aggregate payouts as a percentage of operating income are 48.4%.

We show that payouts increase both because firms' capacity to pay increases and because their willingness to pay increases. Specifically, in the aggregate, higher earnings explain 38% of the increase in real constant dollar payouts and higher payout rates account for 62% of the increase. To explain the increase in payouts, it is therefore essential to explain why the payout rate increases.

Much of the recent debate about payouts focuses on repurchases. In our data, the growth in payout rates, defined as the ratio of net payouts to operating income, comes entirely from repurchases. This finding is consistent with the evidence in Skinner (2008) on the growing importance of repurchases. Dividends average 14.4% of operating income from 1971 to 1999 and 14% from 2000 to 2017. In contrast, net repurchases, defined as stock purchases minus stocks issuance, average 4.8% of operating income before 2000 and 18.3% from 2000 to 2017.[3] Observers who are focused on repurchases might argue that our evidence shows that payouts are high because of repurchases. In other words, if firms only paid dividends, payouts would be much lower. However, there is no basis for such a conclusion. If firms could not pay out via repurchases, they likely would have increased their dividends (see Grullon and Michaely, 2002). A more careful analysis is therefore needed to understand why payouts have increased so much.

The finance literature shows that a firm's payouts depend on firm characteristics. This is not surprising. We expect young firms to have low profits and invest aggressively; thus, they are unlikely to have payouts. Large and older firms are reaping the benefits of their investments, they have free cash flow to distribute so as long as they are successful (DeAngelo, DeAngelo, Stulz, 2006). Hence, if firm characteristics change, payouts should change. It is well-known that firm characteristics in the 2000s differ from characteristics before 2000 (Kahle and Stulz, 2017). We therefore investigate whether changes in firm characteristics can explain changes in payouts. Unfortunately, there is no established empirical model in finance that provides

[3] If we examine net repurchases after the SEC Rule 10b-18 safe harbor, then they average 7.1% of operating income from 1982-1999.

a quantitative estimate of the optimal payout as a function of firm characteristics. In the absence of such a model, we use two empirical approaches to determine whether changes in firm characteristics can explain the high payouts of the 2000s. In the first approach, we use data from 1971 through 1999 to estimate payout and payout rate models. To avoid data snooping concerns, we follow models used in the literature when possible. We then use these models to predict payouts from 2000 through 2018. If these models predict payouts well in the 2000s, then changes in payouts can be explained by changes in firm characteristics. In the second approach, we estimate models over the whole sample period (1971-2018) but allow for intercept and/or slope changes in the 2000s to assess whether firms pay out differently in the 2000s. With this approach, changes in intercepts and/or slopes indicate that changes in firm characteristics are not sufficient to explain changes in payouts.

We conduct our analysis at both the aggregate level and the firm level. Aggregate payouts have drawn much more attention than firm-level payouts. At the aggregate level, we examine whether aggregate earnings, macroeconomic, and financial variables can explain the evolution of aggregate payouts. Using a time-series model of payouts first estimated in the early 2000s by Dittmar and Dittmar (2004), we find that estimating the model from 1971-1999 and using actual values of the explanatory variables in the 2000s to predict payouts explains an increase in aggregate real net payouts from 2000 to 2017 of 52.5%. All the predicted increase in payouts comes from the increase in earnings. Since this approach assumes a constant aggregate payout rate, i.e., the payout rate does not change as firm characteristics change, it is not surprising that it explains only part of the actual increase in aggregate real net payouts of 131.96%.

When examining firm-level payout rates, a model estimated from 1971 to 1999 also predicts an increase in the average net payout rate. For the sample of firms for which our regression model data is available, the average payout rate of the whole sample is 7.3 percentage points higher in the 2000s relative to 1971-1999. When we restrict this sample to firms that have payouts, the difference increases to 10.8 percentage points. When we estimate a model over 1971-1999, this model predicts an increase of 5.2 percentage points in the average payout rate of all firms and an increase of 5.3 percentage points in the average payout rate of the firms with payouts. However, this model does not perform well in the years when the average net payout rate is extremely high. For instance, the highest payout rate for payers is 48.0% in 2007. The model predicts a payout rate of only 25.7% that year. As a result, the model underpredicts the average payout rate in almost every year. In contrast, the model for payers overpredicts the median payout rate, and the prediction errors for the median are much smaller than the prediction errors for the mean in years where the average payout rate is high. In 2007, the difference between the predicted median payout rate and the actual payout rate is only 5.5 percentage points, compared to a difference of 22.4 percentage points between the predicted mean payout rate and the actual payout rate. This evidence suggests that payout models based on firm characteristics previously used in the literature are missing some important determinants of year-to-year variation in average payout rates that are driven by the tail of the distribution.

We also investigate whether payout rates are higher in the 2000s by estimating our models over the whole sample period but allowing for an increase in the payout rate in the 2000s regardless of firm characteristics. We find no evidence that a firm pays out more in the 2000s than it did before, given its characteristics. In other words, existing firms do not suddenly pay out more. However, among firms that pay, the firms that start distributing payouts in the 2000s have higher payouts than predicted by their characteristics. Specifically, the average prediction error for the mean payout rate in the 2000s is 7.1 percentage points for firms that initiated payouts before 2000 and is 12.5 percentage points for firms that initiated afterwards. Further, we find that the firms with higher payouts are firms that initiated payouts with repurchases. Repurchases are a more flexible tool for payouts than dividends in that firms can vary the amount of equity they repurchase each year without fearing the adverse consequences that occur with dividend cuts (Jagannathan, Stephens, and Weisbach, 2000). We also test whether payout rates in the 2000s are more strongly related to the firm characteristics that are positively correlated with payout rates in 1971-1999, as would be expected if managers' incentives for payouts are higher in the 2000s. We find that this is the case. However, allowing the sensitivity of the payout rate to firm characteristics to change in the 2000s does not improve the models' ability to explain the average payout rate in years when it is especially high.

Since models estimated from 1971 to 1999 explain a sizeable fraction of the increase in payout rates during the 2000s, changes in firm characteristics must be of first-order importance to understand why payout rates increase. We show that four characteristics are most important in explaining the increase in payout rates across firms: increases in firm age, size, and cash holdings, and decreases in leverage. Though investment decreases in the 2000s (Gutierrez and Philippon, 2017; Alexander and Eberly, 2018) and is negatively related to payouts, the decrease in investment is less important in explaining the increase in payouts than any of these four characteristics.

One possible explanation for the fact that our models underpredict payout rates is that multinationals benefitted from two tax laws that enabled them to repatriate foreign income advantageously in the 2000s. First, the Homeland Investment Act (HIA) of 2004 provided multinationals with a one-time tax holiday for repatriation of earnings. These firms took advantage of this holiday by repatriating $300 billion of foreign earnings in 2005, an amount substantially higher than the $60 billion or so they repatriated in the years before the Act (Dharmapala, Foley, and Forbes, 2011). Firms could use the repatriated funds for payouts. Second, the 2017 TCJA permanently cut the tax rate on repatriated earnings. Again, firms could repatriate earnings and use them to pay dividends or repurchase stock. The TCJA affects payouts only in 2018, the last year in our sample. To account for these effects, we investigate whether the existence of foreign income affects the performance of our models. Unfortunately, assessing payouts of multinationals shortens our sample period because data on pre-tax foreign income is not available before 1984. We find no evidence that multinationals have a higher average payout rate in the 2000s. However, these firms have significantly higher payout rates than non-multinationals in 2005-2006, in 2013-2016, and in 2018. These results are consistent with Bennett, Thakor, and Wang (2019) who find that the higher repurchases in 2018 can be attributed to the decreased taxation of repatriations.

Another explanation for the underprediction of payout rates from our models is that our models do not account for cross-market arbitrage in which firms make payouts because market conditions are advantageous to issue debt and use the proceeds for payouts. Ma (2019) shows that equity payouts depend on how firms' securities are priced. She argues that firms make payouts financed by debt when equity is priced low and debt is priced high. Farre-Mensa, Michaely, and Schmalz (2019) provide further evidence that many firms simultaneously pay out capital and issue new debt. To assess the importance of this issue, we introduce a measure of non-debt-financed payouts, defined as net payouts less debt issuance. This new measure does not change our findings when we focus on the whole sample, but it improves the predictive power of our models for the sample of multinationals. Since Ma (2019) examines firms with bonds outstanding, which tend to be larger firms, multinationals are more similar to Ma's sample than the firms in our whole sample.

To better understand why actual payout rates exceed predicted payout rates, we investigate whether the characteristics of high payers change from the pre-2000 period to the post-2000 period. We define high payers in several ways. First, we rank firms in each year according to their payout rate and compare the firms in the top decile of payout rates to all other firms. Second, we rank firms in each year according to their dollar net real payouts and compare the firms in the top decile of net real payouts to all others. Regardless of the approach, we find that the top payers perform well compared to the other firms when examining operating income or cash flows, but not stock returns. They are less leveraged. Their ratio of capital expenditures to assets is lower than the other firms and falls in the 2000s. However, capital expenditures also fall for the other firms and the drop is partly offset by an increase in R&D investment. There is little evidence, therefore, that the investment of high payers falls disproportionately relative to other firms. While the performance of the top payers is similar both before and during the 2000s, the performance of the other firms falls. As a result, the performance gap between top payers and other firms increases.

A third way to define high payers is firms that pay out more than their current year's operating income. In this analysis, we include firms with negative operating income and find that the firms that pay out more than their current year's operating income have negative operating income on average. The fraction of firms with payouts in excess of operating income is highest in 2007, when it is 22.7%. The yearly average of the fraction of firms with payouts in excess of operating income is 8.7% before 2000 and 15.1% in the 2000s. We find that when compared to other firms with positive net payouts, the firms with net payouts in excess of operating income have a higher Tobin's q, higher cash holdings, higher investment in R&D, and higher debt growth. These firms also have lower asset growth and poorer stock returns. The higher debt growth suggests that cross-market arbitrage may be particularly relevant for these firms.

Lastly, we examine whether firms have higher payouts because they have excess cash. Following previous literature, we define excess cash as cash in excess of the predicted cash holdings from a model of cash holdings (Opler, Pinkowitz, Stulz, and Williamson, 1999). It is possible that some firms carrying excess cash and would be encouraged by institutional investors or shareholder activists to pay that cash out. However, while higher cash holdings do predict higher payouts in our model, we find no evidence that the firms with the highest holdings of excess cash have higher payouts.

1. The increase in payouts: Aggregate results.

In this section, we begin by introducing the sample used throughout the paper. We then investigate the evolution of aggregate payouts from 1971 to 2018. First, we show that payouts increase dramatically and that the increase takes place through an increase in repurchases. Second, we investigate the evolution of the aggregate payout rate. Third, we show that the increase in the dollar amount of payouts is due to both an increase in operating income and an increase in payout rates. Fourth, we provide statistics using an alternative measure of payouts and demonstrate that using that measure leads to similar inferences.

1.1. The sample.

Our initial data source is all firms in Compustat from 1971 to 2018. We start in 1971 because Compustat data on share repurchases and issuance are unavailable before then. We exclude firms not incorporated in the U.S., financial firms, and utilities (Standard Industrial Classification (SIC) codes 6000–6999 and 4900–4949, respectively) because of their statutory capital requirements and other regulatory restrictions. We also exclude firms with missing data for total assets (AT), dividends (DV), and market capitalization (CSHO and PRCC_F). We merge these observations with data from the Center for Research in Security Prices (CRSP) and restrict the sample to NYSE, AMEX, and NASDAQ firms with CRSP shares codes 10 or 11.

Following Banyi, Dyl, and Kahle (2008), we compute share repurchases as the purchase of common and preferred stock (PRSTKC) minus any reduction in the value of preferred stock; depending on availability, we use redemption (PSTKRV), liquidating (PSTKL), or par value (PSTK) for the value of preferred stock. However, firms often simultaneously issue and repurchase equity, so that it is not clear when a firm has a positive gross payout whether it is raising funds or returning cash to shareholders (Grullon, Paye, Underwood, and Weston, 2011. In particular, firms that are concerned about the dilutive effect of stock-based compensation may offset the dilution by repurchasing (Kahle, 2002; Bonaimé, Kahle, Moore, and Nemani, 2020). Consequently, we also examine net repurchases, defined as repurchases minus issuance of stock (SSTK). If either calculation yields a negative value, (net) repurchases are set to zero. Dividends are measured as cash dividends (DV). Gross (net) payout is defined as the sum of dividends and (net) share repurchases. In the remainder of the paper, we focus on net payouts but perform robustness tests using gross payouts. Real values are reported in 2017 dollars using the CPI. The Appendix contains a complete list of variable names and calculations.

1.2. Aggregate constant dollar payouts

We begin by examining aggregate payouts from 1971 - 2018. Aggregate payouts are obtained by summing the dollar payouts of all firms in our sample. Since we exclude financial firms and utilities, however, our aggregate values do not represent the aggregate of all public firms. As shown in Figure 1, aggregate real net payouts increase over time. They equal $100 billion in 1971. They first exceed $200 billion in 1987, fall to $154 billion in 1991, and then increase steadily to more than $300 billion in 1998. Aggregate net payouts exceed $500 ($600) billion for the first time in 2005 (2006) and in 2007 they reach $740 billion.[4] Net payouts fall during the global financial crisis (GFC), and in 2009, $353 billion is paid

[4] Note that 2005 and 2006 are years when firms could take advantage of the Homeland Investment Act of 2004, which provided firms a one-time tax holiday on the repatriation of foreign earnings. The literature reaches mixed conclusions on the extent to which the Act caused an increase in equity payouts. Dharmapala, Foley, and Forbes (2011) find that firms with repatriated earnings experienced a substantial increase in payouts (up to 92 cents per dollar repatriated depending on their estimates), but Faulkender and Petersen (2012) conclude that at most 25% of the cash repatriated by financially constrained firms goes to equity payouts.

out. They recover quickly, however, to exceed their 2007 peak in 2014, and reach a new peak of $844 billion in 2015. Not surprisingly, the all-time peak is in 2018 when net real payouts exceed $1 trillion. Because of the 2018 Tax Cuts and Jobs Act (TCJA), 2018 is likely to be an exceptional year. In our tests, we ensure that our results are robust to excluding 2018 from the sample.

Table 1 provides summary statistics for relevant sample periods. Panel A shows results for the aggregate constant dollar amounts for each period and the yearly averages in each period. Panel B tabulates yearly averages of our ratios of interest. We refer to the period from 1971 to 1999 as the pre-2000 period. The post-2000 period (or 2000s) starts in 2000 and ends in 2017. We divide this period into the pre-GFC period (2000-2007), the 2010s (2010-2017), and tabulate 2018 separately.

Column (1) of Panel A shows aggregate real net payouts. In the pre-2000 period, total real net payouts equal $4,919 billion. In the post-2000 period, the total is twice the amount in the pre-2000 period. 56% of net real payouts in the 2000s are paid out in the 2010s. We also show the yearly averages. Not surprisingly, the yearly average increases sharply from before to after 2000. Specifically, the average aggregate net payout is 3.23 times larger in the post-2000 period than in the pre-2000 period. The average is 61.1% higher in the 2010s than from 2000 to 2007. The net real payout in 2018 is almost twice the average payout from 2000 to 2017.

The high payouts of the 2000s are often attributed to the growth of repurchases, so we also separately examine the growth in dividends and net repurchases in Figure 1. Real net repurchases are extremely low before the 1982 SEC Rule 10b-18 safe harbor that facilitated repurchases. Real net repurchases increase after 1982, but they do not exceed $100 billion until 1997. After 1997, they exceed dividend payments in every year except for 2009. Net repurchases are extremely large in 2007; the only year with higher net repurchases is 2018. In contrast to net repurchases, the path of dividends is much smoother. In constant dollars, dividends equal $100 billion in 1971. They increase fairly steadily, but do not exceed $200 billion until 2005 and $300 billion until 2014.

Columns (2) and (3) of Panel A show the summary statistics for aggregate real dividends and net real repurchases, respectively. In our sample, total dividend payments are $3,588 billion in the pre-2000 period and $4,236 in the post-2000 period. Since the pre-2000 period is much longer than the post-2000 period, it is not surprising that annual average dividends are higher post-2000 than pre-2000. Real dividend payments are 1.90 times higher per year in the 2000s than before. Yearly average real dividend payments are 68% higher in the 2010s compared to the 2000-2007 period. The increase in net real repurchases is much more dramatic than the increase in real dividends. As seen in Column (3), the sum of real net repurchases is 4 times larger in the 2000s than before 2000. Perhaps more importantly, the annual average of real net repurchases is 6.59 times higher in the 2000s than it was before 2000. Even more dramatically, average net repurchases from 2010 to 2017 are 8.24 times larger than average net repurchases before 2000.

1.3. Increase in income or increase in payout rate?

A firm earns income that it can distribute to shareholders. In a steady state, the amount the firm can pay out depends on its earnings. Consequently, payouts can be viewed as the product of the payout rate and the available income. One could define available income as net income. However, net income is problematic both because it includes many transitory items and because it is negative in the aggregate in two years during our sample period. Floyd, Li, and Skinner (2015) compute an aggregate payout rate using net income by setting the net income of firms that is negative equal to zero. Instead, we use aggregate operating income, computed by adding the operating income of all firms. Operating income is never negative in the aggregate during our sample period and is less affected by transitory items. Operating income has been used in the literature as a measure of a firm’s ability to pay out (e.g., Jagannathan, Stephens, and Weisbach, 2000). Consequently, we define the aggregate payout rate as the ratio of aggregate net payout to aggregate operating income and investigate the following relation:

$$\text{Net payouts} = \text{Payout rate} \times \text{Operating income} \quad (1)$$

In this equation, net payouts can increase either because the payout rate increases or because operating income increases.

In Columns (4), (5), and (6) of Panel A of Table 1, we show how aggregate real operating income, assets, and market capitalization differ in our various sub-periods. Starting with operating income, the average of aggregate real operating income increases less than the average of payouts between the pre-2000s and the 2000s. Specifically, operating income increases by a factor of 1.88 while payouts increase by a factor of 3.23. It follows that the payout rate has to increase to make sense of the increase in real payouts. For comparison, we also show statistics for real assets. The real assets of the industrial listed firms increase by a factor of 2.13, so by less than payouts. Finally, we show data for the real market value of equity. The aggregate market value of equity is higher in the 2000s than in the pre-2000 period by a factor of 2.86, which is comparable to the increase in payouts. However, the real aggregate market value of equity does not exceed its 1999 pre-GFC peak until 2013; specifically, the market value of equity essentially follows a u-shape, decreasing from $18.2 trillion in 1999 to $9.7 trillion in 2008 before increasing again to $20.8 trillion in 2018. If one were to think that payouts should be a constant fraction of the market value of equity, then real payouts should have been similar in 1999 and 2018.

To investigate whether the aggregate net payout rate increases after 2000, we turn to Figure 2 and Panel B of Table 1. Figure 2 shows the net payout rate over time. In 1971, the net payout rate is 17.9%. It exceeds 20% for the first time in 1984 and remains above 20% from 1984 to 1999, with the exception of 1991 to 1995. Before 2000, the highest value of the net payout rate is 25.9% in 1998. It rises above 30% in 2005, when it reaches 33.5%. After this, the payout rate falls below 30% only in 2009 and in 2010, when it is 24.5% and 27.1%, respectively. Following the global financial crisis, the payout rate exceeds 40% for the first time in 2014 and reaches 48.4% in 2018. As shown in Panel B of Table 1, the average pre-2000 payout rate is 19.0%. It averages 32.3% in the 2000s, an increase of 70.5%. The payout rate increases further during the 2010s, and from 2010 to 2017 it averages 32.6% more than from 2000 to 2007.

It is clear from Column (1) of Panel B that the net payout rate is much higher in the 2000s than in the earlier period. Column (2) shows the dividend payout rate. This rate is essentially the same in the post-2000s as in the pre-2000s: 14.4% and 14%, respectively. However, these averages mask the fact that the dividend payout rate follows a u-shape. It is lowest in 2000 when it is 10.0%, but is 17.8% in our first sample year and exceeds 20% in 2015. This evolution is consistent with evidence of disappearing dividends before 2000 (Fama and French, 2002) and of reappearing dividends in the 2000s (Michaely and Moin, 2019). The story for net repurchases is quite different, as shown in Column (3). Before 2000, the average of net repurchases divided by operating income is 4.8%. In the 2000s, the average is 18.3%, or 3.81 times higher. Column (4) shows net repurchases as a percentage of total payouts. Before 2000, repurchases average 22.3% of net payouts. In the 2000s, they average 55.4%.

As an alternative to computing the payout rate, one could compute the ratio of net payouts to assets. We show the summary statistics for this metric in Column (5). Before 2000, the yearly average is 2.7%. In the 2000s, the average is 4.1%, so the ratio increases by 51.8%. In contrast, operating income as a percentage of assets falls slightly, as shown in Column (6). Before 2000, operating income averages 14.5% of assets. In the 2000s, average operating income is only 12.7% of assets. In the 2010s, operating income as a percentage of assets is slightly higher, averaging 12.9%.

Using the statistics in Table 1, we can assess what real net payouts would have been in the 2000s had the payout rate remained at its pre-2000 average. We find that instead of averaging $548 billion per year, they would have averaged $313 billion per year. Since real net payouts averaged $169.6 billion before 1999, it follows that the bulk of the increase in payouts is due to the increase in the payout rate. Average real net payouts increase by 223% from pre-2000 to the 2000s. With a constant payout rate, they would have increased by 84.5%. It follows that 38% of the increase in net payouts is due to an increase in dollar operating income and 62% is due to an increase in the payout rate.

1.4. Gross repurchases versus net repurchases.

So far, we have shown results using real net repurchases. Many studies in the literature use gross instead of net repurchases (e.g., Jagannathan, Stephens, and Weisbach (2000), Grullon and Michaely (2002), and Bennett, Thakor, and Wang (2018)). With gross repurchases, a firm may repurchase shares yet experience no decrease in shares outstanding or no net cash outflow. For instance, consider a firm that issues shares when executives exercise options and then repurchases the same number of shares to prevent dilution. This firm would have positive gross repurchases but zero net repurchases. The argument for using net repurchases is that the measure includes only repurchases that change the number of shares outstanding. The argument for using gross repurchases is that it is a measure of all shares repurchased and that shares issued to executives are a cost to the firm that is unrelated to the firm's payout policy. There is no resolution of this issue in the literature, but the use of net payouts seems more common. Throughout the paper, we focus on net repurchases but examine the robustness of our conclusions using gross repurchases. In this section, we show aggregate results using gross repurchases.

Column (7) of Panel A of Table 1 shows statistics for gross payouts based on gross repurchases instead of net payouts based on net repurchases. As before, statistics are in 2017 dollars. Not surprisingly, real gross payouts are larger than real net payouts. The difference is fairly small, however. Net payouts are smaller than gross payouts by 7.7% in the pre-2000 period and by 8.9% for the 2000s. The difference is due only to the difference between gross repurchases and net repurchases. Since repurchases are one of two components of total payouts, it is not surprising that the difference between gross and net repurchases is greater in percent than the difference between gross and net payouts. Gross repurchases are shown in Column (8) of Panel A. Cumulative net repurchases before 2000 are 20.9% smaller than cumulative gross repurchases. In the 2000s, net repurchases are smaller than gross repurchases by 14.6%.

When gross repurchases are used instead of net repurchases, total payouts are larger than net payouts. Consequently, the ratio of gross repurchases to gross payouts must be larger than the ratio of net repurchases to net payouts. Column (7) of Panel B of Table 1 shows that repurchases account for roughly 4.2% more of payouts from 2000 to 2017 when we use gross repurchases. Further, since gross payouts are larger than net payouts, the payout rate is higher with gross payouts. As shown in Column (8), the payout rate computed using net payouts is 1.5 percentage points lower before 2000 and 3.2 percentage points lower in the 2000s than the payout rate using gross payouts. Though we do not tabulate the yearly payout rate using gross payouts, it is noteworthy that, using net payouts, the payout rate never exceeds 50%, but with gross payouts the ratio exceeds 50% in 2015 and 2018. Irrespective of the payout measure, the aggregate payout rate increases sharply from pre-2000 to the 2000s. Specifically, with the net measure the payout rate increases by 70.5% and with the gross measure it increases by 73.8%.

2. Why are aggregate payouts so high in the 2000s?

In this section, we investigate why aggregate real net payouts are so high in the 2000s. One approach is a top-down approach that models aggregate real net payouts as a function of aggregate variables. One would expect aggregate payouts to depend on aggregate earnings and variables that proxy for growth opportunities, financial market conditions, and general economic conditions. If nothing changes in the relation between aggregate payouts and their determinants, then aggregate real net payouts would be higher in the 2000s because of changes in the value of its determinants.

To conduct our analysis, a key decision is choosing a model for aggregate payouts. Fitting a model to the data with hindsight could create an obvious bias. Such an exercise would be vulnerable to criticisms of data mining. However, Dittmar and Dittmar (2004) disseminate a model that explains aggregate repurchases and aggregate dividends well from 1984 to 2000. They estimate their model using log changes in quarterly aggregate repurchases and dividends. We follow their approach except that we show results using both annual data and quarterly data. The disadvantage of annual data is that we have fewer observations, but the advantages are that we avoid seasonality issues and that our estimates are comparable to our subsequent firm-level analysis.

The explanatory variables are similar to those used by Dittmar and Dittmar (2004). We calculate their measures of permanent and temporary earnings. They differentiate between permanent and temporary earnings because several papers (Guay and Harford, 2000; Jagannathan, Stephens, and Weisbach, 2000) show that firms are more likely to use repurchases to pay out temporary earnings and dividends to pay out permanent earnings. However, more recent evidence indicates that since the 1990s repurchases respond more to permanent earnings than dividends do (Skinner, 2008). For permanent earnings, Dittmar and Dittmar (2004) use operating income before depreciation. For temporary earnings, they use the difference between net income and operating income. For each earnings variable, they use lagged changes in the logarithm of the variable. This means that if the change in payouts is from t-1 to t, the change in an earnings variable is from t-2 to t-1. As a measure of growth opportunities, they use market to book and again include lagged changes. They also include the return on the value-weighted market portfolio for t-1 and for t+1. Firms tend to issue more equity when their stock has performed well. A high return in t+1 would proxy for investment opportunities. Behavioral finance models use the lead return as a proxy for market timing, so firms would be more likely to issue equity when that return is low. We include the lagged yield on the 10-year Baa bond as a proxy for the cost of borrowing. A higher yield makes it harder for firms to raise funds through debt to finance payouts. Lastly, we include the lead and lagged changes in the log of GDP. The predictions associated with GDP are ambiguous. On the one hand, high growth means good investment opportunities and hence more investment, so firms pay out less. On the other hand, high growth means that firms worry less about bad times and hence do not need to keep as much of a liquidity buffer.

In Column (1) of Table 2, we report estimates of the regression over the 1971-2017 period using log changes in real net payouts as the dependent variable. The regression stops in 2017 since we require forward values of several variables. We find highly significant coefficients for both earnings measures. A change in permanent or temporary earnings predicts an equal change in net payouts. Surprisingly, market to book is not significant. The lagged and forward market returns have positive and significant coefficients. The lagged Baa yield is not significant. The forward change in GDP has a positive coefficient and is highly significant, while the lagged change in GDP is significant at the 10% level. The R-squared of the regression is high, explaining 68.2% of the time-series variation in payout changes. In Columns (2) and (3), we estimate the regression separately for changes in real dividends and real net repurchases. The regression for dividends has much lower explanatory power, and only two variables, lagged permanent earnings and lagged Baa yield, are significant. The regression for repurchases performs much better. In untabulated analysis, we estimate these regressions using gross payouts and gross repurchases. The results are similar.

In Column (4), we estimate the model from 1971 to 1999. We use this model to forecast payouts in each year from 2000 to 2017 as follows. We first forecast the log change in aggregate net real payout for each year, using the model and the realized values of the independent variables in that year. To estimate net real payouts in 2000, we start from the ***actual*** aggregate net real payout in 1999 and use the forecasted log change to obtain our estimate of net real payouts in 2000. We proceed in the same way for 2001, except that we now start from our ***estimated*** aggregate net real payout in 2000 and use the forecasted log change to estimate the aggregate payout in 2001. We proceed this way in each year. With this approach, the only actual aggregate net real payout we use is from 1999 to obtain our base when estimating 2000. This exercise answers the question: If the determinants of aggregate payouts were the same in the 2000s as they were before 2000, what would the payouts be? Figure 3 shows the results. We see that actual aggregate payouts exceed predicted aggregate payouts in almost all years. The largest prediction errors are in 2007 and 2015. From 2000 to 2017, the actual aggregate real net payout rate increases by 131.9%. The predicted aggregate real net payout rate increases by 52.4%. This model assumes that the aggregate payout rate is constant (i.e., the coefficients on the two earnings variables are not assumed to change over time), so that changes in firm characteristics do not affect it. We saw in the previous section, however, that the increase in payouts is due more to an increase in payout rates than an increase in operating income. Figure 3 also shows that if we redo the estimates while keeping the earnings variables constant at their 1999 levels, the other explanatory variables do not predict an increase in aggregate real net payouts. In other words, all the predicted increase is due to an increase in earnings. The results provide a different approach in evaluating the importance of earnings in explaining the increase in payouts.

An alternative approach to investigate why payouts are so high in the 2000s is to allow the relation between aggregate net real payout and its determinants to change in the 2000s. With this approach, we learn whether a change in the role of the determinants of net real payouts helps explain the increase in aggregate net real payout. With yearly data, it is not possible to allow the slope for each determinant to change in the 2000s, since we would use 17 observations to estimate 11 coefficients. However, we can allow for a change in the intercept. In Column (5) of Table 2, we report estimates of the regression reported in Column (1) except that now we allow the intercept to change in the 2000s. The indicator variable for the 2000s is positive and significant, indicating that the mean change in log payouts is higher in the 2000s in ways that are not captured by the regression model. We also estimate the regression for dividends and repurchases separately but do not tabulate the results. The indicator variable is significant (at the 10% level) for dividends but not for repurchases, despite the fact that the coefficient estimate on the 2000s indicator variable in the repurchase regression is more than 1.5 times as large as the coefficient on the same indicator variable in the regression for dividend payouts. Though we do not tabulate the results, we also estimate the regression model with an indicator for the 2010s. The coefficient on the indicator variable is not significant. This evidence suggests that the 2000s differ from the period from 1971 to 1999, but the 2010s are not significantly different from the early 2000s.

Finally, we estimate the regressions using quarterly data. In Column (6), we show estimates of the regression in Column (5) but with quarterly data.[5] With quarterly data, we include additional lags for the earnings variables and for GDP. We find that the second lags of the earnings variables are positive and significant. The coefficients on the earnings variables in the quarterly regressions are much lower than in the annual regressions. This suggests that quarterly regressions with only two lags may not capture the full impact of earnings changes. The R-squared of the quarterly regressions is also much lower (0.271) than the R-squared of the yearly regression. Nevertheless, we find that quarterly net real payouts increase in lagged earnings and in lagged and leading stock returns, and fall as the credit spread increases. While the indicator variable for the 2000s is positive in the quarterly regressions and is roughly one third of the indicator variable for the annual regressions, it is not statistically significant.

3. Firm-level payouts.

Aggregate payouts reflect the payouts of the largest firms. As shown by DeAngelo, DeAngelo, and Skinner (2004), a small number of firms account for a large share of aggregate dividends. In particular, they find that 25 firms account for 55% of dividend payments in 2000. We find similar results for aggregate net payouts. In 2018, ten firms account for more than 25% of the aggregate net payouts in our sample. Before 2000, the net payouts of 338 firms, on average, account for 90% of the net payouts in each year. In the

[5] Since quarterly data from the statement of cash flows is only available from Compustat beginning in the first quarter of 1984, these regressions start in the third quarter of 1984.

2000s, 90% of net payouts come from the top 248 payers; thus, fewer than 10% of firms make 90% of the net payouts. Another way to see this is to look at the net payouts of firms who pay out more than $100 million in 2017 dollars. In 2018, these firms represent 21.7% of the firms in our sample. Yet, these firms' net payouts amount to 97.5% of aggregate net payouts. These high payers dominate aggregate payouts, so their behavior is highly influential in our aggregate regressions. Table 3 reports data that is more representative of the whole population of firms by examining equally-weighted averages of firm characteristics. Such averages give more weight to small firms.

Column (1) of Table 3 shows the mean number of firms in our sample periods. Remember that our sample excludes financials and utilities. We do not tabulate the yearly number of firms, but its evolution follows the known inverted u-shape documented in Doidge, Karolyi, and Stulz (2017). Specifically, 1,857 firms are in our sample in 1971. This number increases to a maximum of 5,597 firms in 1997. After peaking, the number of firms falls to a low of 2,662 in 2018. The number of firms in 2018 is the lowest number in the 2000s. Column (1) shows that the average number of firms is lower in the 2000s than before. We also show averages for the pre-GFC 2000s and the post-GFC 2000s. The average number of firms in the 2010s is lower than the average number of firms from 2000 to 2007 by 27%.

Table 1 shows that aggregate real net payouts increase by 223% from pre-2000 to the 2000s. Since the yearly average number of firms falls over this time, the average net payout per firm must increase by more than the average aggregate net payout. Column (2) of Table 3 shows the average real net payout per firm. As expected, the average annual net payout per firm increases by 300% from the pre-2000s to the 2000s, which is much higher than the 223% increase in average aggregate net payout.

The number of firms in the sample changes substantially throughout our sample period, but not all of these firms make payouts. In Section 1, we show that the aggregate net payout rate increases sharply in the 2000s. One obvious way that payouts could increase is if the fraction of firms with payouts increases. Column (3) shows that this fraction decreases from 54.6% during the pre-2000s to 48.0% in the 2000s. The average fraction of firms with positive net payouts is higher from 2010 to 2017 than from 2000 to 2007, but it is still lower than before 2000. It follows that the higher average net payout rate of the 2000s is not explained by an increase in the fraction of firms with positive net payouts.

The average percentage of firms that pay out before 2000 masks a steady decrease in that percentage during the period. In 1971, 71.9% of firms have net payouts. This percentage dips below 70% in 1972 but then exceeds 70% every year until 1980. It then falls rapidly to below 50%. After 1983, it does not exceed 50% again until 2008. The lowest fraction of firms with payouts is 38.2% in 2001. After 2011, this fraction exceeds 50% every year and its highest value is 57% in 2018. We can distinguish between firms that only pay dividends, that only repurchase, and that do both. In Column (4), we show the statistics for firms that only pay dividends. It is well-known from Fama and French (2001) that the fraction of dividend payers falls in the 1980s and the 1990s. The decrease in the fraction of firms that only pay dividends is dramatic. In 1971, 60.4% of firms paid dividends and did not repurchase; in 2000, that fraction reaches a minimum of 12.3%, so that the fraction in the 2000s is higher than in 2000. It is not surprising that the fraction of firms that only pay dividends is high before 2000 compared to the 2000s. It is also not surprising that the fraction of firms that only repurchase has the opposite evolution, as shown in Column (5).

We next turn to the evolution of firms' average net payout rate over our sample period. The increase in the average payout rate during the 2000s is striking, as shown in Figure 4. Before 2000, the average yearly payout rate is range-bound between 10% and 16%. In the 2000s, the net payout rate exceeds 16% in thirteen years. The net payout rate for 2018 (29.5%) is not the highest in the 2000s; it is higher in 2015 (32.3%). Column (6) of Table 3 shows averages of net payout rates for the sub-periods. The average net payout rate before 2000 is 12.5%. It is 20.9% in the 2000s, or 67.2% higher. The statistics reported in Column (6) are for average payouts across all firms. We also report statistics for the net payout rate for firms with positive net payouts (i.e., net payers) in Column (7). Not surprisingly, the average net payout rate for net payers is higher than the average net payout rate for all firms with positive operating income. Though we do not tabulate these numbers, the net payout rate for net payers ranges between 14 and 20% before 1983. From 1983 to 2004, it is between 20 and 30%, except in one year when it is slightly less than

20%. After 2004, it is below 30% only in 2009, and is above 40% in 2007, 2008, and 2015. The highest net payout rate during the whole sample period for the net payers is 44.0% (in 2015).

We also investigate whether the volatility of the average annual payout rate changes (results untabulated). The standard deviation of the annual payout rate is 1.7% from 1971 to 1999 and 6.5% from 2000 to 2017. In other words, the standard deviation increases by almost a factor of 4 while the payout rate increases by a factor of less than 2. The standard deviation increases mainly because the covariance between the average dividend payout rate and the average repurchase payout rate switches sign. This covariance is negative before 2000 but positive in the 2000s. This evolution supports the view that dividends and repurchases were substitutes before 2000 but become complements in the 2000s.[6]

Does the payout rate increase because firms are more profitable in the 2000s? We find the opposite. In Column (8), we show the ratio of operating income to assets. This ratio is 79.0% lower in the 2000s than before and is negative in the last four years of our sample (not tabulated). Note that the average operating income ratio in Table 3 is an equal-weighted average across firms. As discussed earlier, aggregate operating income is never negative. It follows that the distribution of the operating income to assets ratio across firms is positively correlated with assets, so that large firms are more likely to have positive operating income to assets and large dollar operating income. Though we do not show the statistics, the well-known result that the fraction of firms with accounting losses is higher in the 2000s than earlier holds for our sample (Denis and McKeon, 2019). This fraction is 40.2% in the 2000s and 27.1% in the pre-2000s. Column (9) shows that the net payers perform better than other firms, even though their performance is weaker in the 2000s. In contrast, as shown in Column (10), the non-paying firms have much worse performance. In fact, non-paying firms in the 2000s have negative average operating income every year.

[6] John and Williams (1985) suggest that firms may switch from dividends to repurchases since repurchases are more tax effective. In agency models (Jensen (1986)) and signaling models (Miller and Rock (1985)), repurchases and dividends play a similar role. Empirically, Grullon and Michaely (2002) and Skinner (2008) find evidence of a substitution effect. More recently, Banyi and Kahle (2014) and Floyd, Li, and Skinner (2015) suggest that dividends and repurchases complement each other, with dividends increasingly concentrated in firms that also repurchase.

4. Determinants of the payout rate.

Section 3 shows that the average payout rate of firms is higher in the 2000s compared to 1971 to 1999. From the finance literature, we know that payout rates depend on firm characteristics. Hence, as a firm's characteristics change, we expect its payout rate to change. To assess the extent to which payout rates change because of changes in firm characteristics as opposed to changes in the relation between payout rates and firm characteristics, we use two different approaches. Both approaches start from estimates of regressions that relate firms' net payout rates to lagged firm characteristics motivated from the financial economics literature. With the first approach, we use the coefficients from regressions estimated over the period 1971 to 1999 to predict the yearly average net payout rates during the 2000s, conditional on the realizations of the explanatory variables. With the second approach, we estimate regressions over the whole period but allow intercepts and slopes to change in the 2000s. We also use the regression models estimated using pre-2000s data to assess which changes in firm characteristics between 1971-1999 and 2000-2017 are most important in explaining why the net payout rate is higher in the 2000s. We end this section by exploring two important factors that may explain why our models underpredicts the payout rate: repatriation tax cuts and cross-market arbitrage.

4.1. Predicting payouts in the 2000s.

It is well-established that firms should pay out funds that they cannot productively reinvest. In general, because young firms have better growth opportunities, they are not expected to pay dividends or repurchase shares (DeAngelo, DeAngelo, and Stulz, 2006). As profitability increases and growth opportunities decline, firms should pay out the funds they cannot invest profitably. We therefore expect payouts to increase with firm age. Large firms are more likely to have free cash flows, so we expect large firms to have higher payout rates. Financially constrained firms need to conserve their resources to survive, so we expect firms with high leverage or accounting losses to pay out less. Profitable firms are expected to pay out more if they have exhausted their growth opportunities. Firms with more growth opportunities should pay out less (e.g., Smith and Watts, 1992). Tobin's q, measured as the ratio of the market value of assets to the book value of assets, is often used as a measure of growth opportunities. However, Tobin's q could also proxy for rents (Stigler, 1964), in which case payouts would be positively correlated with Tobin's q (Lee, Shin, and Stulz, 2020). Further, Tobin's q could proxy for overvaluation. Undervalued firms should repurchase more, so if low Tobin's q proxies for undervaluation, low q firms should repurchase more. Firms with higher R&D or capital expenditures are expected to pay out less because they have better investment opportunities. Firms with large cash holdings have more internal resources, so all else equal, they are likely to pay out more.

In Table 4, we estimate models that relate the net payout rate to the lagged firm characteristics discussed above. The use of lagged characteristics gives our regressions the interpretation of forecasting regressions. They address the question: given a firm's characteristics in one year, what are its expected payouts the next year? Note that our models do not include a firm's stock performance as an explanatory variable for the simple reason that a firm's stock price is the present value of future payouts. We estimate these models using both all firms with positive operating income and available data or among these firms, only the payers.

Column (1) shows estimates using all firms. We estimate the model with firm fixed effects and cluster the standard errors by firm and year. As expected, the payout rate increases with firm age. From our discussion, the net payout rate should be negatively related to variables that proxy for financial weakness. We find negative and significant coefficients on leverage and on an indicator variable for accounting loss. Larger firms and firms with lower Tobin's q ratios have higher payout rates. Investment in R&D and capital expenditures are associated with a lower payout rate. As expected, the net payout rate increases with cash holdings. Surprisingly, lagged operating cash flow has a negative and significant coefficient. A dummy for high tech firms is not significant, although the firm fixed effects probably account for this. Firms with higher selling, general, and administrative (SG&A) expenses have higher payouts, but firms with higher advertising expenses do not. Column (2) shows estimates of the regression when run on the sample of payers. Not surprisingly, the number of observations drops by roughly half. The explanatory power of the regression increases, but the sign and significance of coefficients change for two variables. Specifically, the accounting loss indicator variable has a significantly negative coefficient in column (1) and a positive but insignificant coefficient in column (2). Further, the hi-tech indicator variable is negative and insignificant in column (1) but positive and insignificant in column (2).

A concern with regressions (1) and (2) is that the payout rate is skewed. Before 2000, the average ratio of mean to median is 1.6. In the 2000s, it is 1.7. One way to assess whether this issue affects our inferences is to estimate the regressions using the log of one plus the payout rate. When we do so (not tabulated), the inferences are similar in that no significant coefficient becomes insignificant or changes sign.

Though we do not tabulate the results, we estimate the regressions separately for dividends and repurchases. Most firm characteristics have similar coefficients in both. However, there are two important differences. First, repurchases increase with operating income while dividends fall. This result is consistent with evidence that repurchases adjust quickly to earnings but the relation between earnings and dividends has weakened (Skinner, 2008). Second, repurchases are unrelated to Tobin's q while dividends fall with Tobin's q. These differences suggest that while operating income and Tobin's q may proxy for growth opportunities for dividend-paying firms, they do not appear to do so for firms that repurchase.

The regressions in columns (1) and (2) use the whole sample period. We also estimate the regressions from 1971 to 1999 without firm fixed effects (untabulated) and use these regressions to forecast payout rates in the 2000s, conditional on realized values of the explanatory variables. The coefficients are largely consistent with the results in columns (1) and (2). One difference is that unlike column (1), advertising to sales has a positive and significant coefficient while the high-tech indicator variable has a negative and significant coefficient. Further, operating cash flow to assets and PPE to assets are no longer significant. When we use only the firms that have positive net payouts, the notable differences with the column (2) results are that the high-tech indicator variable has a significantly negative coefficient, PPE to assets is no longer significant, and the accounting loss indicator variable becomes positive and significant.

In Figure 5, we plot the predicted average payout rate for each year in the 2000s from our regressions estimated before 2000. Figure 5.a. shows the predicted payout rates from a regression that uses all firms. On average, the predicted values for the 2000s are close to, but lower than, the actual values. More precisely, the average of the predicted values is 17.4% and the average of the actual values is 20.2%. The regression predicts an increase in payout rates in the 2000s, since the average pre-2000s payout rate is 12.9%. Thus, the regression model can explain an increase in the net payout rate in the 2000s. However, as is evident from Figure 5.a., the regression model does not do a good job of capturing the high payout rates in 2007-2008 and 2014-2018. As a result, the difference between the average actual payout rate and the predicted payout rate is larger in the 2010s. If we include 2018, the average actual payout rate in the 2010s is 24.8% while the average predicted rate is 19.0%. When we redo the analysis on the net payers, the model again predicts an increase in average payout rates in the 2000s, as shown in Figure 5.b. However, the model systematically underpredicts the payout rate and performs worse than the model that includes all firms. In the 2010s, the model predicts an average payout rate of 26.0% when the actual payout rate is 35.4%.

We use the same approach to estimate predicted median payout rates. We limit this analysis to the firms with payouts since the median payout rate is zero in some years for the whole sample. Whereas the model underpredicts the mean, it overpredicts the median in most years. Figure 5.c shows predicted and actual median payouts. Not surprisingly, the model still underpredicts median payouts in 2007 and 2015. However, the underpredictions are small compared to the underpredictions using the means. In 2007, the actual median payout rate is 30.0% and the predicted median payout rate is 24.4%, an underprediction of 18.7%. In contrast, the underprediction of the mean is 46.8%, as the mean payout rate for payers is 48.1% and the mean predicted payout rate is 25.6%.

A concern with these results is that the predicted payout rate could be negative even though a firm cannot have a negative payout rate given the way we compute the payout rate. To investigate whether negative predicted net payout rates affect our results, we set the negative predicted rates to zero. Since there are very few of these, making this change has no discernible impact on Figure 5.

4.2. Does the regression model change in the 2000s?

We now turn to a more formal investigation of whether the determinants of payout rates differ in the 2000s compared to the pre-2000s. We first add an indicator variable for the 2000s to the regressions in Columns (1) and (2) of Table 4. The results are in Column (3) for the whole sample and in Column (4) for the net payers. Regardless of the sample used, the indicator variable does not have a significant coefficient. In Columns (5) and (6), we re-estimate the regressions from Columns (3) and (4) without firm fixed effects. When we do so, the indicator variable is significant for the firms with payouts. This suggests that the increase in the payout rate for these firms is not an increase within firms, but is an increase due to new payers with high payout rates. This evidence is consistent with Michaely and Moin (2019) who examine the phenomenon of reappearing dividends and conclude that dividend trends are driven by newer firms.

In columns (7) and (8), we estimate the models with no firm fixed effects with two additional indicator variables, an indicator variable for 2010-2017 and an indicator variable for 2018. The coefficient on the indicator variable for the 2010s measures how the intercept differs during 2010 to 2017 compared to the whole period from 2000 to 2017. The indicator variable for 2018 measures how the intercept in 2018 differs from the rest of the 2000s. As explained earlier, we treat 2018 differently because of its unique features due to the TCJA. The coefficients on the indicator variables for 2010-2017 and for 2018 are positive and significant in the regression for all firms. Since 2018 is the first year that the TCJA is in effect, it is perhaps not surprising that our model does poorly in predicting payout rates that year. When we turn to the model estimated for the firms with payouts, the coefficients on the indicator variables for the 2000s and for 2018 are positive and significant, but coefficient on the indicator variable for the 2010s is not. This evidence suggests that there are discrete shifts in payout rates that cannot be explained by the evolution of firm characteristics. Though we do not tabulate the results, we also estimate firm fixed effects models with these additional indicator variables. We find that only the 2018 indicator variable is significant.

In untabulated results, we estimate the regressions in columns (7) and (8) separately for the repurchase payout rate and the dividend payout rate. The 2000s indicator variables are not significant in firm fixed effects regressions. Without firm fixed effects, when only the 2000s indicator variable is included, the coefficients on the indicator variables are not significant when examining all firms. However, when examining payers, the coefficient is positive and significant for the repurchase payout rate and negative and significant for the dividend payout rate. This evidence is consistent with the growth of repurchases substituting for dividends as discussed in the literature (Grullon and Michaely, 2002). The repurchase regressions with all three period indicator variables have positive and significant coefficients for all variables in both regressions, except for the 2010s indicator variable for payers. In the dividend regressions, the 2000s indicator variable is significantly negative, the 2010s indicator variable is significantly positive, and the 2018 indicator variable is not significant.

The above evidence is consistent with our finding that there is no increase in the intercept for the 2000s or the 2010s in firm fixed effects regressions, i.e. the increases in intercepts without fixed effects result from changes in sample composition. We perform three additional tests to check for other potential explanations for the increase in payout rates. First, we estimate the regressions on a sample of firms that are in Compustat for at least ten years to verify that the difference in results between regressions with and without firm fixed effects are not driven by firms that are in Compustat for a short time. The untabulated results are similar. Second, we use two additional definitions of payout. In Table 4, a firm is a payer if it pays out in the same year that we measure the payout. We reestimate the regressions defining a firm as a payer if it pays out (1) in the previous year or (2) in any of the past three years. The results for the regressions with firm fixed effects are not affected by these choices. However, evidence of intercept shifts is weaker with the alternate definitions. Third, we estimate the regressions of Table 4 using gross payouts instead of net payouts. Using gross payouts makes no difference for the regressions with firm fixed effects. For the regressions without firm fixed effects, when only the 2000s indicator variable is used, the coefficient on that variable is significant both for the whole sample and for the sample of firms with payouts. In contrast, when all three indicator variables are used, only the indicator variable for 2018 is significant for the whole sample. These additional regressions do not change our earlier conclusions.

We also investigate the extent to which the results depend on whether a firm initiates payouts with dividends or with repurchases. Our results are the same for both groups of firms when using firm fixed effects. Without firm fixed effects, when examining the whole sample there is an intercept shift for firms that start payouts with repurchases but not for firms that start payouts with dividends. For payers, we find that the intercept shift is larger for firms that start payouts with repurchases than for those that start payouts with dividends. These results suggest that the change in payout rates that cannot be explained by firm characteristics is related to the arrival of firms that initiate payouts with repurchases. Banyi and Kahle (2014) show that firms that go public in the 1990s and 2000s are much less likely pay dividends and much more likely to use repurchases for payouts.

The oft-expressed view that changes in governance and increased institutional ownership have increased managers' incentives to make payouts in the 2000s implies that the payout rate should have become more sensitive to firm characteristics. We investigate this possibility in the last four columns. For this investigation, we add interactions of firm characteristics with the indicator variable for the 2000s. Columns (9a) and (10a) show the uninteracted coefficients, while Columns (9b) and (10b) show the variables interacted with the 2000s indicators. The sign of most interacted variables is the same as the sign of the non-interacted variables. Such a result is consistent with managers having stronger payout incentives in the 2000s. There are a few exceptions in which the interacted variable has a significant but opposite sign to the sign of the non-interacted variable. First, the interacted coefficient on Tobin's q is positive while the coefficient on Tobin's q is negative. This is consistent with the view that Tobin's q may not reflect investment opportunities as much in the 2000s as it did before (Lee, Shin, and Stulz, 2020). Second, for the whole sample only, operating income has a negative coefficient while the interaction is positive. Third, the indicator variable for accounting loss is positive and significant for firms with payouts, but the interaction for these firms is negative and significant. These results are similar whether we use the whole sample or only the payers. When we allow firm characteristics to relate differently to the payout rate in the 2000s, the indicator variable for the 2000s has a significantly negative coefficient in both samples. Though we do not graph the fitted values for the payout rate, they are higher when we allow the slopes to change in the 2000s.

We also estimate an alternative specification that allows for slow adjustment of dividends and repurchases (untabulated). With this model, we re-estimate the regressions of Table 4 but include the lagged payout rate as an independent variable to account for slow adjustment. None of our results differ meaningfully with this alternative specification.

4.3. The role of changing firm characteristics.

We can use the regression models to assess which firm characteristic changes are most important in explaining the increase in payout rates. To do so, we estimate firm-level models over the period 1971-1999. We then use the coefficients from these models to estimate how the payout rate changes, given the change in average firm characteristics between the pre-2000 period and the 2000s; thus, the sample is restricted to firm-year observations in which all the data necessary to estimate the regressions is available. The results are in Table 5. In Panel A, we report results for the whole sample of firms with positive operating income. In Panel B, we show results for the subset of firms that have positive net payouts.

We report the average value of the dependent variable (net payout) and the averages of the firm characteristics used as explanatory variables. Column (1) reports the average firm characteristics for the 2000s and Column (2) for the 1971-1999 period. Column (3) shows the difference in firm characteristics between the two periods. The first row reports the average net payout rate. As we see, the payout rate increases by 7.3 percentage points for the whole sample and by 10.8 percentage points for the payers

In light of Kahle and Stulz (2017), the differences in firm characteristics are not surprising. In Panel A, we see that in the 2000s, firm leverage, tangible assets, and capital expenditures are lower than before. The drop in capital expenditures is substantial, as it is 36%. This decrease in capital expenditures has concerned some economists and, as discussed in the Introduction, politicians have argued that repurchases may be responsible for this decrease. Cash flow to assets increases. Tobin's q is sharply higher in the 2000s. In contrast to capital expenditures, R&D investment increases and so do SG&A expenses. The fraction of firms with accounting losses is greater in the 2000s, as is the percentage of high-tech firms. As noted earlier, listed firms have become older. Results in Panel B for the net payers are similar.

In Column (4), we report the regression coefficients for the model estimated from 1971 to 1999. We multiply the change in the firm characteristic in column (3) by its regression coefficient to obtain the column (5) "impact," i.e. the change in the net payout rate that would be predicted by the change in that firm characteristic. In Panel A, the payout rate increases from pre-2000 to post-2000 by 7.3 percentage points. Changes in firm characteristics explain an increase in the payout rate of 5.2 percentage points. The four most important firm characteristics that explain the change in payout rates are cash holdings, leverage, age, and assets. All variables except market leverage are positively related to payout rates and increase from before 2000 to the 2000s. In contrast, market leverage is negatively related to payout rates and falls from before 2000 to the 2000s. These four variables explain 70% of the increase in the payout rate. For the sample of payers in Panel B, the payout rate increases by 10.8% and the change in firm characteristics predicts a change of 5.3%. The four most important firm characteristics that explain the change in the payout rates of the payers are the same as the four most important firm characteristics that explain the change in the payouts rates of all firms.

Table 5 shows that the concern that firms decrease capital expenditures to increase payouts has little relevance quantitatively. If we examine the firms with positive net payouts in Panel B, the change in capital expenditures predicts an increase in payouts of less than one percentage point. Since the net payout rate for that sample increases by 10.8 percentage points, almost all of the increase in the net payout rate has to be explained by other factors than the decrease in capital expenditures.

4.4. The role of multinational firms.

Our models predict a substantial increase in the average payout rate from the pre- to the post-2000 period. However, they do not explain year-to-year fluctuations in the payout rate well. For instance, the payout rate is extremely large in some years, including 2007, 2015, and 2018. These high payout rates are not explained by our model. A possible explanation for the inability of our models to explain payout rates in some years is that multinational corporations benefitted from tax holidays and tax law changes. The high payout rate in 2018 could be due to the benefits of the TJCA for multinational corporations. Multinationals also benefit from a repatriation tax holiday before the GFC. We therefore explore whether our ability to explain variation in the payout rate differs between multinational and domestic firms. We define multinationals as firms with material pre-tax foreign income in any of the previous three years. We use this definition because foreign income can be volatile, so firms might enter and exit our sample because they have low foreign income in a particular year. We define material foreign income as foreign income of at least 3% of sales. Since we need three years of data to classify firms and Compustat data on foreign income starts in 1984, this analysis starts in 1987. For the multinational firms, average pre-tax foreign income as a percentage of sales over our sample period is 5.7%. For non-multinational firms, it is 0.45%. Not surprisingly, pre-tax foreign income as a percentage of sales increases over our sample period, from 4.47% in 1987 to 6.79% in 2018.

We estimate regressions in which we allow payout policies to differ for multinationals. Because the sample period differs when using our multinational indicator variable, models (1) to (4) of Table 6 provide estimates of regressions (5) to (8) of Table 4 for this shorter period for comparison. Models (5) to (8) of Table 6 then show estimates of the same regressions, but adding the multinational indicator variable and interactions of that variable with indicator variables for the 2000s, the 2010s, and 2018. The main result is that neither the multinational indicator variable nor its interactions with the period indicators are significant, except for the 2018 indicator. In untabulated results, we re-estimate the regressions with year fixed effects and interactions of these year fixed effects with the multinational indicator to assess whether the high payout rates that the Table 4 models fail to explain could be associated with events affecting multinational corporations. This exercise shows that multinationals have significantly higher payouts than non-multinationals in 2005-2006, in 2013-2016, and in 2018. The non-multinationals show no evidence of abnormally high payouts except in 2007, 2008, 2015, and 2016. In 2008 and 2016, the evidence only holds for the whole sample and not the payers only. Multinationality does not seem helpful in understanding the high payout rate of 2007. Overall, the years in which the models of Table 4 perform most poorly are only partly explained by issues specific to multinationals.

4.5. Cross-market arbitrage and debt-financed payouts.

Another possible explanation for the high payout rate years is cross-market arbitrage. Ma (2019) shows that firms with public debt issue debt when debt is priced high relative to equity, and use the proceeds for equity payouts. Farre-Mensa, Michaely, and Schmalz (2019) build on earlier research showing that firms with payouts often simultaneously issue debt and show that this phenomenon is economically important.

The payout rate models we have estimated so far do not account for the possibility that firms could have high payout rates in some years because it is advantageous for them to issue debt that year to finance payouts. To investigate whether this behavior helps explain why our models underpredict payout rates, we create a new measure of payouts that proxies for payouts that are not affected by cross-market arbitrage. With this measure, models using traditional variables to predict payouts should perform better, as they would be predicting the part of payouts that traditional variables are expected to explain. We compute this measure as follows: For each firm in year t, we compute net debt issuance as the maximum of debt issuance minus debt reduction, or zero. We take the maximum of a firm's net payouts minus net debt issuance, or zero, and call this measure non-debt-financed net payouts. We then re-estimate our models using non-debt-financed net payouts divided by operating income as the dependent variable. This approach assumes that money is fungible. A firm might issue debt to finance investment, so the debt issuance is not designed to finance payouts; however, the firm could also have financed investment by paying out less. Consequently, with this perspective, any net debt issuance enables the firm to increase net payouts dollar for dollar and keep everything else the same.

We re-estimate the Table 4 regressions and replicate Figure 5 using this new definition of non-debt-financed net payouts. We do not tabulate the results. When examining the whole sample, the estimates for the period indicator variables are similar to those in Table 4, except that the estimate for the 2010s indicator variable is not significant. As a result, inferences are similar when we use non-debt financed net payouts. Turning to the predicted values for the 2000s from a regression estimated from 1971 to 1999, the mean prediction error using the new payout definition is 16%, compared to 18% using the old definition. The correlation between the predicted non-debt-financed net payout rate and the actual non-debt-financed net payout rate is 69%, versus 70% when we use the net payout rate. With the new measure of payouts, the prediction error is 35% in 2007 and 37% in 2015. In comparison, the respective prediction errors using net payouts are 40% and 39%. In summary, using non-debt-financed net payouts instead of net payouts on the whole sample does not improve the performance of the model much.

Ma (2019) uses a sample of firms with bonds, which tend to be large firms. We also consider a sample of larger firms, namely our sample of multinationals. We use non-debt-financed net payouts in regressions that include only multinationals. In this sample, the indicator variable for the 2000s with firm fixed effects is negative for the whole sample irrespective of the definition of payouts. However, when we estimate the model until 1999 and predict payouts conditional on firm characteristics for the 2000s, the forecast error is 4.6% when using non-debt-financed net payouts and 10% when using net payouts. Further, the use of non-debt-financed net payouts cuts the forecasting errors sharply in 2015, 2016, and 2017. With net payouts, the forecast errors are, respectively, 36.4%, 24.2%, and 12.6%. When we use non-debt-financed net payouts, the forecast errors fall to 21.6%, 13.2%, and 3%, respectively. This evidence suggests that taking into account cross-market arbitrage reduces the prediction errors of our models and helps explain some of the large prediction errors found when using net payouts.

5. Have the high payout firms changed?

As we saw earlier, the majority of payouts comes from a small number of firms. In this section, we investigate whether the firms with high payouts have evolved differently from other firms. In particular, one concern expressed by politicians and commentators is that payouts have occurred at the expense of investment. If true, high payout firms should experience a larger decrease in investment. Another concern is that firms borrow to make payouts. Hence, it could be that high payout firms borrow more in the 2000s than earlier. We proceed as follows. First, we investigate how firms in the top decile of payers change from before 2000 to the 2000s compared to other firms. Second, we examine whether the extent to which firms pay out more than they earn changes from before 2000 to the 2000s and whether the characteristics of these firms change. Lastly, since high payout firms in the 2000s have much larger cash holdings than high payout firms in the pre-2000s, we investigate the relation between payouts and cash holdings.

5.1. High payout firms versus other firms.

In this section, we compare high payout firms to all other firms. We classify firms as high payout firms in two distinct ways. First, we sort firms into deciles in each year according to their net payout rate, computed as net payouts divided by operating income. Second, we sort firms into deciles in each year according to their dollar amount of net payouts. We classify firms in the top decile of each as top payers. We show results for both classifications in Table 7.

Panel A of Table 7 compares firms in the top decile of positive net payout rates to all other firms. In the first row, we show the average net payout rate of the top payers versus all other firms. In the 2000s, the firms in the top decile have an average net payout rate of 1.343. In other words, they pay out 34.3% more than their operating income. Before 2000, the average net payout rate of these firms is only 0.871, which is less than operating income. The average net payout rate of firms that are not in the top decile is one-tenth of the average net payout rate of the firms in the top decile for the 2000s and slightly less than one-tenth before 2000. In percentage terms, the average net payout rate of the top payers increases less from before to after 2000 than the average net payout rate of the other firms – 54% versus 72%.

We next examine lagged characteristics to assess firms' situations before they make payout decisions. In the 2000s, the high payers are larger on average than the other firms in terms of both assets or market capitalization. They are also older. They have more cash. Their accounting performance is better than the performance of the other firms. The high payers have operating income of 13.2% of assets on average, which is more than five times the percentage for the other firms, which is 2.4%. Average net income is 6% for top payout rate firms, compared to -7.3% for other firms. The high payers are less leveraged than the other firms. Not surprisingly, the top net payers invest and acquire less than other firms. We also consider contemporaneous changes. While top payers decrease cash holdings, other firms accumulate cash. Top payers experience much lower asset growth than other firms. However, top payers acquire more debt than the other firms. Specifically, debt grows by 5.8% of assets for top payers, but only grows by 2.4% of assets for other firms. Since debt grows more than assets for top payers, the leverage of top payers increases. The opposite is the case for the other firms. Top payers have worse stock return performance than other firms.

Lastly, top payers are more likely to be multinationals than other firms. All the differences between top payers and other firms in the 2000s are statistically significant at least at the 5% level.

It is not surprising that top payers are firms that perform better but invest and grow less than other firms. The lifecycle view of payouts predicts such an outcome (DeAngelo, DeAngelo, and Stulz, 2006). We therefore expect top payers to compare similarly to other firms in the pre-2000 period. This turns out to be the case. However, some changes are surprising. In particular, the performance of the top payers is similar in both periods, but the performance of the other firms falls sharply. For instance, when examining net income, the average for the top payers is 6.3% of assets before 2000 and 6% of assets for the 2000s. In contrast, the average net income of the other firms is -0.9% before 2000 and -7.3% after. In terms of investment, capital expenditures fall for both groups of firms and capital expenditures as a percentage of assets fall similarly for top payers and other firms. It is noteworthy, however, that while the ratio of capital expenditures to assets falls for both types of firms, the ratio of the sum of capital expenditures and R&D to assets is similar across periods. Specifically, before 2000, the top payers spend 8.6% on R&D and capital expenditures. In the 2000s, they spend 8.7%. The firms that are not top payers spend 14.9% before 2000 and 14.7% after. In other words, while capital expenditures fall, R&D expenditures increase. The increase in R&D largely offsets the drop in capital expenditures, so that investment in tangible and intangible assets as a percentage of assets does not change. In the 2000s, top payers decrease their cash holdings; this is not the case before 2000. In the 2000s, the debt of the top payers increases at twice the rate of the other firms; before 2000, there is no difference in debt growth. However, in both periods the top payout rate firms increase their leverage compared to other firms.

We turn next to the second definition of top payers, namely the firms with the largest constant dollar payouts. In Panel B of Table 7, we compare the firms in the top decile of real net dollar payouts to the other firms. The average net real payouts of the top payers are 94 times the average net real payouts of the other firms in the 2000s. Not surprisingly, dollar payouts of the top payers increase sharply from before 2000 to the 2000s, but proportionately the increase is similar to other firms. The average real net payouts of the top payers in the 2000s are 4.46 times what they were before 2000. For the other firms, the real net payouts in the 2000s are 4.44 times what they were before 2000.

The top dollar net payers differ from other firms in ways that are similar to how the top net payout rate firms differ from other firms. Not surprisingly, the top dollar net payers are extremely large firms. The average assets of the top dollar net payers in the 2000s are $472 billion in 2017 dollars. An important difference between the top payout rate firms and the top dollar net payout firms is that the increase in R&D spending does not offset the decrease in capital expenditures. As a result, the top dollar net payout firms experience a decrease in capital expenditures from 9% to 5.1% as well as a decrease in the sum of capital expenditures and R&D from 11.4% to 8%. In contrast, the other firms experience an increase in R&D expenditures as a percentage of assets from 4.5% to 8.3% that offsets the decrease in capital expenditures as a percentage of assets from 10.3% to 6.4%. In the year that firms are classified as top dollar payers, their operating cash flow is very large. Despite this, they increase debt by more than the other firms in the 2000s. Before 2000, top payers increase debt by 3.6% of assets, which is less than the 4.6% increase of other firms, but in the 2000s they increase debt relative to assets by 4.2%, which is more than the 2.5% increase of other firms. As a result, leverage increases for top payers in the 2000s relative to other firms, but the opposite is the case before 2000. The bottom line is that the top payers are hugely successful in the 2000s compared to other firms. However, they are also successful before 2000. In fact, the averages of operating income to assets and net income to assets are similar for top payers in the 2000s and the period before 2000. In contrast, the performance of the other firms declines significantly from before 2000 to the 2000s. Though capital expenditures fall for both groups, increases in R&D compensate for some or all of the decrease in capital expenditures, depending on the measure of top payers. Lastly, on average, top payers also issue debt, so they simultaneously have large payouts and debt issuance. However, for top firms by payout rate, the average increase in debt relative to assets is higher than the average increase in assets, indicating that they increase leverage; the opposite is the case for the top dollar payout firms.

5.2. Net real payouts in excess of operating income.

In this section, we characterize firms with high payouts in a different way, namely by examining firms with payouts in excess of operating income. In this analysis, we consider all firms whether they have positive operating income or not. The percentage of firms with net payouts in excess of operating income increases substantially over time. In the pre-2000 period, the yearly average of firms with net payouts in excess of operating income is 8.9%. In the 2000s, the yearly average is 15.1%. Firms with positive operating income account for 61.2% of the increase in the fraction of firms that have net payouts in excess of operating income. Specifically, 2.9% of firms with positive operating income have net payouts in excess of operating income before 2000, but after 2000, 6.6% of these firms pay out more than their operating income.

To better understand the firms with payouts in excess of operating income and whether these firms change over time, in Panel C of Table 7 we compare the characteristics of firms with payouts in excess of operating income to the characteristics of firms with payouts smaller than operating income both for the 2000s and the period before 2000. We do not provide statistics for the payout rate as it is meaningless when operating income is negative. Firms that pay out more than operating income differ from other payers. They have a higher Tobin's q than other payers. These firms are smaller than other payers, but they have much more cash as a fraction of assets. They invest less in capital expenditures than other firms but more in R&D. They are less profitable than other firms and have negative operating cash flow on average. From the previous year, their leverage increases more than the leverage of other firms. However, it is noteworthy that leverage increases more for these top payers before 2000 than in the 2000s. Compared to firms that pay out less than their operating income, these firms have poor stock market performance. Their average stock return net of the value-weighted market portfolio is 14.7 percentage points lower in the 2000s than the stock return of the firms with payouts lower than operating income. Overall, the firms that pay out more than their operating income are generally similar in the 2000s than before. These are firms that in the year of their high payouts grow less and borrow more than other firms.

5.3. Role of cash holdings.

An important change over our sample period is the increase in cash holdings (Bates, Kahle, and Stulz, 2009). We examine whether high cash holdings can help explain the increase in payouts. Activist investors such as Carl Icahn have pushed firms with high cash holdings to increase payouts.[7] We see in Table 7, Panel A, that firms with high payout rates decrease their cash holdings in the 2000s, but not before. This result raises the question of whether firms that pay out more are firms with excess cash holdings. We estimate a model of cash holdings similar to the one in Bates, Kahle, and Stulz (2009) to rank firms based on their excess cash holdings during the 2000s.[8] We find little evidence that there is a strong relation between excess cash holdings and net payouts. The firms in the bottom quintile of excess cash holdings have an average net payout ratio in the 2000s of 20.8%. In contrast, firms in the top quintile have an average net payout rate of 24.2%. Across quintiles, the net payout rate has a u-shape. It follows that on average firms in the top quintile of excess cash holdings have a higher payout rate, but the difference is rather moderate.

6. Conclusion.

In this paper, we show that payouts in the 2000s are sharply higher than from 1971 to 1999, whether measured as constant dollar aggregate payouts or firm-level payouts. The increase in payouts results from both an increase in payout rates and an increase in funds available for payouts. Thirty-seven percent of the increase in aggregate constant dollar payouts is explained by an increase in constant dollar aggregate operating income while sixty-three percent of the increase is explained by an increase in the payout rate.

As documented in Kahle and Stulz (2017), firm characteristics change substantially over time. Specifically, firms in the 2000s are larger and older than firms over the period 1971-1999. Larger and older firms have higher payouts, so changes in firm characteristics imply an increase in payouts and payout rates.

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[7] "Icahn says bigger buybacks can drive Apple shares to $700," by Edwin Chan and Jennifer Ablan, Reuters, August 13, 2013.

[8] The model differs from the model in Bates, Kahle, and Stulz (2009) in that we use firm age instead of IPO indicator variables and include asset growth and tangible assets as additional variables.

To investigate how much of the increase in payouts can be explained by changes in firm characteristics, we estimate models on data from 1971 to 1999 that relate payouts to firm characteristics. We then use these models to predict payout rates in the 2000s given actual firm characteristics. Models estimated from 1971 to 1999 predict an increase in payout rates for the 2000s because of changes in firm characteristics, but they do not predict an increase as large as the actual increase. For the firms with available data to predict the payout rate, the payout rate increases from 12.9% to 20.2% from before the 2000s to the 2000s. Changes in firm characteristics explain 71% of that increase. Models estimated from 1971 to 1999 are less successful in explaining the increase in payout rates for firms that have payouts. For these firms, the payout rate increases by 10.8%. Of this increase, changes in firm characteristics explain 49% of the increase. However, the predicted average payout rate for payers is always below the actual payout rate in the 2000s. In contrast, the predicted median payout rate for payers is on average too high. Yet, we find the same issue with medians that we find with means, namely that a few years have extremely high payout rates that the model cannot explain. We investigate whether the underprediction can be explained by the tax law changes that affect multinationals and by cross-market arbitrage. We find that both tax law changes and cross-market arbitrage explain part of the prediction errors of our models.

The question this paper tries to answer is why payouts are so high in the 2000s. The answer is that a sizeable fraction of the increase in payouts can be explained by changes in firm characteristics. Firms have become older and larger. Older and larger firms pay out more. However, there is also evidence that part of the increase in payout rates can be explained by the fact that firms are more sensitive to determinants of payouts in the 2000s. In other words, if a firm's payout rate is positively related to a firm characteristic before 2000, it is more strongly related to that firm characteristic in the 2000s. An increase in the sensitivity of payouts could be a positive development if it means that firms are less likely to hoard funds internally that could be invested more profitably outside the firm. Alternatively, such an increase could be problematic if it means that firms are more reluctant to take advantage of valuable internal investment opportunities. However, while our study does not provide tests that would establish or reject a causal relation between capital expenditures and payouts, it does show that even if one were to argue that firms decreased capital expenditures to increase payouts, this effect would explain little of the increase in payouts given the weak relation between capital expenditures and payouts. Further research should help understand better why in some years the payout rate is much higher than can be explained by firm characteristics that are known to be important determinants of payout rates.

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Appendix: Variable Definitions

Variable name	Definition
Net Payout ($2017)	sum of dividends and net repurchases, in $2017
Dividends ($2017)	cash dividends (DV) in $2017
Net Repurchases ($2017)	purchase of common and preferred (PRSTKC) minus issuance of stock (SSTK) minus decreases in preferred stock in $2017; set to zero if negative
Preferred Stock	Depending on availability, the book value of preferred stock is given by redemption (PSTKRV), liquidation (PSTKL), or par value (PSTK) of preferred stock in order of preference
Payout ($2017)	sum of dividends and repurchases, in $2017
Repurchases ($2017)	purchase of common and preferred (prstkc) minus decreases in preferred stock in $2017; repurchases are set to 0 if negative
Operating income ($2017)	operating income (OIBDP), in $2017
Assets ($2017)	AT in $2017
Market Cap ($2017)	market capitalization = CSHO * PRCC_F; log mc is used in the payout regressions
Net payout/OI	(dividends + netrep) / oibdp; set to missing if OIBDP < 0
Dividends / OI	dividends / oibdp; set to 0 if negative and to missing if OIBDP < 0
Net Repurchases/ OI	netrep / oibdp, set to missing if OIBDP < 0
Net Rep / Net Payout	net repurchases, divided by the sum of dividends and net repurchases
Net payout/assets	(dividends + netrep) / AT
OI /assets	operating income (OIBDP) / assets (AT)
Dividends / Net Payout	cash dividends (DV), divided by the sum of dividends and net repurchases
Gross payout/ OI	(dividends + rep) / oibdp; set to missing if OIBDP < 0
ΔRpay	the change in log real (net) payouts
ΔRdiv	the change in log real dividends
ΔRrep	the change in log real repurchases
ΔROI	the change in log real operating income (OIBDP)
ΔREtemp	the change in log real temporary income, where temporary income is measured as the difference between operating income (OIBDP) and earnings before extraordinary items (IB)
Agg MB	aggregate market to book is calculated as the sum of the market value of assets of all firms in the sample divided by the sum of the book value of assets. The market value of assets is equal to the market value of equity (CSHO*PRCC_F) plus the book value of debt (DLC + DLTTt) plus the book value of preferred stock minus investment tax credits (TXDITC)
VWret	the annual buy-and-hold return on the CRSP VW index
Baa_10y	the spread between Moody's Baa corporate bond yield and 10-year Treasury constant maturity rates; Sources: FRED and the Federal Reserve
ΔRgdpa	the change in log annual real GDP

Fraction of firms that payout (net)	fraction of firms with positive net repurchases and dividends (DV)
Fraction of firms that only pay dividends	fraction of firms with DV > 0, but repurchases = 0
Fraction of firms that only repurchase	fraction of firms with repurchases > 0, but DV = 0
Market Leverage	total debt (DLC + DLTT) / (assets (AT) - book equity (CEQ) + mkt equity (CSHO*PRCC_F)
Cash flow operations (OCF) / lag assets	(operating income (OIBDP) minus interest (XINT) minus income taxes (TXT) minus change in NWC)/lagged assets, where NWC = (RECT + INVT + ACO - AP - TXP - LCO) - (lag_rect + lag_invt + lag_aco - lag_ap - lag_txp - lag_lco)
Fixed assets	net PPE (PPENT) divided by assets (AT)
Tobin's q	the market to book ratio is calculated as the market value of assets divided by the book value of assets; the market value of assets is equal to the market value of equity (CSHO*PRCC_F) plus the book value of debt (DLC+DLTT) plus the book value of preferred stock minus investment tax credits (TXDITC)
R&D / assets	R&D (XRD) / lagged assets. If R&D is reported annually, then quarterly R&D is set equal to one-fourth of annual R&D; If R&D is missing, it is set equal to 0
SGA / sales	SG&A (XSGA) divided by sales (SALE)
Advertising / sales	advertising expenses (XAD) divided by sales (SALE); XAD set to zero if missing
Capex / assets	capital expenditures (CAPX) / lagged assets
Cash / assets	cash and marketable securities (CHE) divided by assets (AT)
Fraction with accounting losses	fraction of firms with (IB + XIDO) < 0; IB is net income excluding extraordinary items and discontinued operations, and XIDO is extraordinary items and discontinued operations
High tech dummy	dummy equal to one if the firms 3 digit SIC is 283, 357, 366, 67, 382, 384, or 737 (Department of Commerce definition)
Age	years since CRSP listing
Industry cash flow volatility	the mean of the standard deviations of cash flow/assets over 10 years for firms in the same industry, as defined by the two-digit SIC code, where cash flow is defined as EBITDA (OIBDP) - interest (XINT) - taxes (TXT) - common dividends (DV)
Multinational firm (MNF)	firms with material pre-tax foreign income (PIFO) in any of the last three years; we define material foreign income to be foreign income of at least 3% of sales
Acquisitions / assets	acquisitions (ACQ) / lagged assets
ΔCash /lag assets	(cash (CHE) - lagged cash) / lagged assets
ΔAssets / lag assets	(assets (AT) - lagged assets) / lagged assets
Δdebt / lag assets	(debt (DLC + DLTT) - lagged debt) / lagged assets
Δleverage	market leverage minus lagged market leverage
Raw return	12-month buy-and-hold return on the firm, calculated using CRSP monthly data; require at least six months of data during the fiscal year
VW abnormal ret	raw return on the firm minus the return on the CRSP value-weighted index
EW abnormal ret	raw return on the firm minus the return on the CRSP equal-weighted index

Table 1

This table examines aggregate firm characteristics. Panel A shows aggregate total amounts and annual averages (in $MM) of firm characteristics, and Panel B shows ratios of key aggregate variables. All numbers are in 2017 dollars. The sample begins with all firms listed on Compustat from 1971 to 2018. We exclude firms not incorporated in the U.S. and financial firms and utilities (SIC codes 6000–6999 and 4900–4949, respectively) because of their statutory capital requirements and other regulatory restrictions. We also exclude firms with missing data for total assets (AT), dividends (DVC), and market capitalization (CSHO and PRCC_F). We then merge these observations with data from the Center for Research in Security Prices (CRSP) and restrict the sample to NYSE, AMEX, and NASDAQ firms with CRSP shares codes 10 or 11. We divide the sample into several time periods, including pre-2000 (1971-1999) and post-2000 (2000-2018). The post-2000 period is further subdivided into pre- vs. post-GFC (2000-2007 and 2010-2017, respectively). We report the year 2018 separately due to the 2018 Tax Cuts and Jobs Act (TCJA). Details on all variables are provided in the Appendix.

Table 1, Panel A (in $MM)	(1) Net Payout	(2) Dividends	(3) Net Repurchases	(4) Operating Income	(5) Assets	(6) Market Capitalization	(7) Gross Payout	(8) Gross Repurchases
Total 1971-1999	4,918,520	3,588,803	1,376,313	25,443,577	176,972,130	149,035,955	5,327,573	1,738,770
Total 2000-2017	9,862,059	4,236,499	5,626,157	29,697,558	233,735,877	264,559,187	10,822,684	6,586,185
Total 2000-2007	3,418,660	1,413,908	2,005,015	11,765,451	94,236,416	110,094,843	3,871,152	2,457,244
Total 2010-2017	5,508,961	2,380,370	3,128,925	14,782,505	115,185,282	133,523,324	5,937,664	3,557,293
Avg 1971-1999	169,604	123,752	47,459	877,365	6,102,487	5,139,171	183,709	59,958
Avg 2000-2017	547,892	235,361	312,564	1,649,864	12,985,326	14,697,733	601,260	365,899
Avg 2000-2007	427,333	176,738	250,627	1,470,681	11,779,552	13,761,855	483,894	307,156
Avg 2010-2017	688,620	297,546	391,116	1,847,813	14,398,160	16,690,416	742,208	444,662
2018	1,003,702	366,196	637,505	2,076,161	16,109,359	20,387,561	1,041,879	675,683

Table 1, Panel B	(1) Net payout/ OI	(2) Dividends/ OI	(3) Net Repurchases/ OI	(4) Net Repurchases/ Net Payout	(5) Net Payout / Assets	(6) Operating Income/ Assets	(7) Gross Repurchases/ Payout	(8) Gross Payout/ OI
1971-1999	0.1898	0.1439	0.0480	0.2235	0.0274	0.1451	0.2611	0.2046
2000-2017	0.3235	0.1403	0.1832	0.5535	0.0413	0.1270	0.5955	0.3557
2000-2007	0.2815	0.1192	0.1623	0.5542	0.0357	0.1244	0.6068	0.3188
2010-2017	0.3732	0.1612	0.2120	0.5665	0.0476	0.1289	0.5989	0.4022
2018	0.4838	0.1764	0.3075	0.6352	0.0623	0.1289	0.6485	0.5023

Table 2

This table reports estimates of aggregate payout regressions following Dittmar and Dittmar (2004) using the sample described in Table 1. The dependent variables include the change in log net real payouts (ΔRpay), the change in log real dividends (ΔRdiv), and the change in log net real repurchases (ΔRrep), expressed in 2017 dollars. Control variables include lagged values of the change in log real operating income (Δroi), the change in log real temporary income (Δretemp), the aggregate Tobin's q ratio, and the spread between Baa bonds and 10 year Treasuries (Baa_10y), and lead and lagged values of the CRSP value-weighted return (VWret) and the change in log annual real GDP (ΔRgdpa). Models (1), (2), (3), and (5) use data from 1971-2018, while model (4) is from 1971 – 1999. Model (6) uses quarterly data and starts in 1984, since that is the first year that Compustat collects quarterly data for statement of cash flow variables.

	(1) ΔRpay	(2) ΔRdiv	(3) ΔRrep	(4) ΔRpay	(5) ΔRpay	(6) ΔRpay
L1.ΔROI	0.5841**	0.3382**	0.8747	0.8542*	0.4465**	0.0303
	(0.013)	(0.032)	(0.234)	(0.057)	(0.039)	(0.891)
L2.ΔROI						0.4079*
						(0.051)
L1.ΔREtemp	0.8292***	0.1641	1.8748***	0.8766*	0.7252***	0.1768
	(0.000)	(0.176)	(0.002)	(0.069)	(0.000)	(0.144)
L2.ΔREtemp						0.4194***
						(0.001)
L1.Chg.Agg MtB	-0.4790	-0.1509	-2.2692**	-0.2935	-0.5554**	0.0289
	(0.113)	(0.456)	(0.023)	(0.457)	(0.047)	(0.567)
L1.VWret	0.6505**	0.2731	2.9092***	0.5123*	0.6985***	0.3556**
	(0.013)	(0.115)	(0.001)	(0.077)	(0.004)	(0.031)
F1.VWret	0.2104**	0.0856	0.5897*	0.2493**	0.2525***	0.3393**
	(0.034)	(0.195)	(0.065)	(0.044)	(0.007)	(0.025)
L1.Baa_10y	-0.0310	0.0326*	0.0054	0.0327	-0.0670**	-0.0368*
	(0.205)	(0.053)	(0.945)	(0.490)	(0.011)	(0.096)
L1.ΔGDP	1.4575*	0.3534	8.6144***	1.8751**	1.5009**	-0.3560
	(0.057)	(0.487)	(0.001)	(0.015)	(0.033)	(0.558)
L2.ΔGDP						0.1770
						(0.799)
F1.ΔGDP	2.2174***	0.2866	2.2847	1.4343	2.9326***	-0.8360
	(0.004)	(0.561)	(0.334)	(0.170)	(0.000)	(0.152)
2000s dummy					0.0946***	0.0357
					(0.006)	(0.286)
Constant	-0.0309	-0.0990*	-0.4240*	-0.1798*	-0.0071	0.0298
	(0.679)	(0.056)	(0.085)	(0.099)	(0.917)	(0.717)
Observations	45	45	45	27	45	136
R-squared	0.6820	0.2500	0.6054	0.6348	0.7440	0.2710
Adjusted R-squared	0.6114	0.0833	0.5177	0.4725	0.6782	0.1998

Table 3

Table 3 examines firm-level averages of key variables. The sample begins with all firms listed on Compustat from 1971 to 2018. We exclude firms not incorporated in the U.S. and financial firms and utilities (SIC codes 6000–6999 and 4900-4949, respectively) because of their statutory capital requirements and other regulatory restrictions. We also exclude firms with missing data for total assets (AT), dividends (DVC), and market capitalization (CSHO and PRCC_F). We then merge these observations with data from the Center for Research in Security Prices (CRSP) and restrict the sample to NYSE, AMEX, and NASDAQ firms with CRSP shares codes 10 or 11. We divide the sample into several time periods, including pre-2000 (1971-1999) and post-2000 (2000-2018). The post 2000 period is further subdivided into pre- vs. post-GFC (2000-2007 and 2010-2017, respectively). We further study the year 2018 separately due to the 2018 Tax Cuts and Jobs Act (TCJA). Details on all variables are provided in the Appendix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	No. Firms	Net Payout ($MM) / Firm	Fraction of firms that payout (net)	Fraction of firms that only pay dividends	Fraction of firms that only repurchase	Net Payout Ratio	Net Payout (Payers)	OI / assets	OI / assets (Payers)	OI / assets (Non Payers)
1971-1999	4,020	42.26	0.546	0.357	0.072	0.125	0.212	0.084	0.141	0.025
2000-2017	3,280	178.82	0.480	0.159	0.161	0.209	0.345	0.018	0.119	(0.081)
2000-2007	3,815	117.07	0.416	0.166	0.132	0.169	0.323	0.019	0.116	(0.051)
2010-2017	2,787	247.92	0.541	0.152	0.183	0.247	0.365	0.016	0.124	(0.114)
2018	2,662	377.76	0.570	0.105	0.216	0.295	0.385	(0.034)	0.116	(0.234)

Table 4

Table 4 shows estimates of firm-level net payout regressions. Net payout is calculated as net payout as a fraction of operating income, for firms with positive operating income. The sample begins with all firms listed on Compustat from 1971 to 2018. We exclude firms not incorporated in the U.S. and financial firms and utilities (SIC codes 6000–6999 and 4900-4949, respectively) because of their statutory capital requirements and other regulatory restrictions. We also exclude firms with missing data for total assets (AT), dividends (DVC), and market capitalization (CSHO and PRCC_F). We then merge these observations with data from the Center for Research in Security Prices (CRSP) and restrict the sample to NYSE, AMEX, and NASDAQ firms with CRSP shares codes 10 or 11. Odd columns present results for all firms with available data and even columns present results for firms with positive net payout. All control variables are lagged relative to the dependent variable and all continuous variables are winsorized at the 1% and 99% levels. Details on all variables are provided in the Appendix. P-values are in parentheses; ***, ** and * denote significance at 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9a)	(9b)	(10a)	(10b)
Market Leverage	-0.290***	-0.389***	-0.290***	-0.388***	-0.237***	-0.284***	-0.237***	-0.285***	-0.245***	-0.152***	-0.2460***	-0.251***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(assets)	0.046***	0.046***	0.047***	0.044***	0.021***	0.010***	0.020***	0.010***	0.037***	0.015***	0.0222***	0.017***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
OCF / assets	-0.032***	-0.092***	-0.031***	-0.094***	0.016*	-0.113***	0.016*	-0.113***	-0.037***	0.067***	-0.1342***	0.079
	(0.001)	(0.000)	(0.001)	(0.000)	(0.075)	(0.000)	(0.062)	(0.000)	(0.001)	(0.001)	(0.000)	(0.103)
net PPE / assets	-0.028*	-0.083***	-0.030*	-0.075***	-0.009	0.005	-0.008	0.006	-0.019	0.008	-0.0364	-0.005
	(0.095)	(0.001)	(0.070)	(0.005)	(0.274)	(0.716)	(0.353)	(0.651)	(0.242)	(0.700)	(0.174)	(0.865)
Tobin's q	-0.014***	-0.013***	-0.014***	-0.013***	-0.004	0.002	-0.004	0.001	-0.020***	0.013**	-0.0313***	0.018**
	(0.000)	(0.001)	(0.000)	(0.001)	(0.180)	(0.726)	(0.145)	(0.752)	(0.000)	(0.013)	(0.000)	(0.010)
RD / assets	-0.324***	-0.532***	-0.324***	-0.527***	-0.344***	-0.195***	-0.339***	-0.192***	-0.226***	-0.163**	-0.4961***	-0.073
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.000)	(0.004)	(0.000)	(0.039)	(0.000)	(0.629)
SGA / sale	0.057***	0.250***	0.058***	0.249***	0.051***	0.180***	0.051***	0.180***	0.037**	0.051**	0.2009***	-0.007
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.020)	(0.044)	(0.000)	(0.916)
Advert. / sales	0.148	0.057	0.145	0.070	0.311***	0.084	0.309***	0.085	0.076	0.339	0.0303	0.313
	(0.160)	(0.699)	(0.176)	(0.639)	(0.000)	(0.362)	(0.000)	(0.358)	(0.474)	(0.114)	(0.852)	(0.285)
Capex	-0.118***	-0.186***	-0.119***	-0.183***	-0.195***	-0.278***	-0.194***	-0.277***	-0.088***	-0.156***	-0.1625***	-0.148*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.052)
Cash / assets	0.310***	0.431***	0.311***	0.431***	0.291***	0.533***	0.287***	0.532***	0.242***	0.169***	0.3410***	0.241***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Table 4, continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9a)	(9b)	(10a)	(10b)
Acct Loss	-0.021***	0.006	-0.020***	0.006	-0.034***	0.027***	-0.034***	0.027***	-0.009**	-0.025***	0.0217**	-0.042***
	(0.000)	(0.399)	(0.000)	(0.444)	(0.000)	(0.005)	(0.000)	(0.006)	(0.030)	(0.000)	(0.016)	(0.001)
Hitech dummy	-0.008	0.001	-0.008	0.001	-0.022***	-0.000	-0.022***	-0.000	-0.009	-0.001	-0.0017	-0.011
	(0.369)	(0.932)	(0.368)	(0.943)	(0.000)	(0.984)	(0.000)	(0.943)	(0.297)	(0.905)	(0.911)	(0.533)
Log(age)	0.029***	0.029***	0.030***	0.028***	0.032***	0.015***	0.031***	0.015***	0.029***	0.014**	0.0185***	-0.009
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.018)	(0.000)	(0.326)
2000s dummy			-0.005	0.011	0.012	0.067***	-0.004	0.061***	-0.156***		-0.078*	
			(0.683)	(0.414)	(0.283)	(0.000)	(0.766)	(0.005)	(0.000)		(0.081)	
2010s dummy							0.036*	0.010				
							(0.089)	(0.682)				
2018 dummy							0.049***	0.027*				
							(0.002)	(0.056)				
Constant	-0.126***	-0.076**	-0.129***	-0.065**	-0.004	0.106***	0.000	0.107***	-0.067***		-0.016	
	(0.000)	(0.016)	(0.000)	(0.024)	(0.744)	(0.000)	(0.998)	(0.000)	(0.000)		(0.586)	
Observations	108,450	67,008	108,450	67,008	109,846	68,410	109,846	68,410	108,450		67,008	
Adjusted R-square	0.230	0.276	0.230	0.276	0.117	0.139	0.119	0.139	0.237		0.283	
Fixed Effect	Firm	Firm	Firm	Firm	No	No	No	No	Firm		Firm	
Cluster	Firm&Year	Firm&Year	Firm&Year	Firm&Year	Firm&Year	Firm&Year	Firm&Year	Firm&Year	Firm&Year		Firm&Year	

Table 5

Table 5 examines the role of changing firm characteristics on the ratio of net payout to operating income by estimating the regression models of Columns (1) and (2) in Table 4 without fixed effects over the period 1971-1999. We show for these models how the payout rate changes given the change in average firm characteristics between the pre-2000 and the post-2000 periods. Columns (1) and (2) show the mean value of firm characteristics in the post-2000 and pre-2000 periods, respectively, for firms with available data to estimate the regression and calculate predicted values. Column (3) shows the difference between the two and whether they are significantly different. Column (4) provides the coefficient estimate of the regression model estimated from 1971-1999. Column (5) examines the impact of each variable by multiplying the coefficient estimate by the change in mean value of the variables from the pre- to the post-2000 period. Panel A provides the results for all firms with available data, while Panel B estimates the regression and predicted values for firms with positive payout only. Details on all variables are provided in the Appendix.

Panel A: All firms

	(1)	(2)	(3)	(4)	(5)
	Mean (D2000s=1)	Mean (D2000s=0)	Diff.	Coefficient	Impact
Net payout / OI	0.2019	0.1286	-0.0733***		
Market Leverage	0.1738	0.2192	0.0454***	-0.2667	0.0121
Log (Assets)	6.4146	4.2536	-2.1610***	0.0052	0.0112
Cash flow operations / assets	0.0971	0.068	-0.0291***	-0.0662	-0.0019
Fixed assets	0.2628	0.3259	0.0631***	0.0089	-0.0006
Tobin's q	1.5549	1.2436	-0.3114***	-0.0063	-0.0020
R&D / assets	0.0306	0.0263	-0.0043***	-0.3253	-0.0014
SGA / sales	0.2474	0.2211	-0.0263***	0.0942	0.0025
Advertising / sales	0.0117	0.0116	-0.0001	0.1155	0.0000
Capex / assets	0.059	0.0926	0.0336***	-0.2506	0.0084
Cash / assets	0.148	0.1043	-0.0437***	0.3040	0.0133
Fraction with losses	0.2121	0.1468	-0.0653***	0.0048	0.0003
High tech dummy	0.2671	0.1836	-0.0835***	-0.0181	-0.0015
Log Age	2.7095	2.3438	-0.3657***	0.0319	0.0117

Panel B: Net Payers only

	Mean (D2000s=1)	Mean (D2000s=0)	Diff.	Coefficient	Impact
Net payout / OI	0.2709	0.1629	-0.1079***		
Market Leverage	0.1661	0.2142	0.0481***	-0.2741	0.0132
Log (Assets)	6.7657	4.4863	-2.2794***	0.0040	0.0091
Cash flow operations / assets	0.1016	0.0713	-0.0303***	-0.0667	-0.0020
Fixed assets	0.2642	0.3341	0.0699***	0.0103	-0.0007
Tobin's q	1.589	1.2012	-0.3878***	-0.0059	-0.0023
R&D / assets	0.028	0.022	-0.0060***	-0.3034	-0.0018
SGA / sales	0.241	0.2125	-0.0285***	0.1036	0.0030
Advertising / sales	0.0124	0.0123	-0.0001	0.0428	0.0000
Capex / assets	0.0557	0.0908	0.0350***	-0.2594	0.0091
Cash / assets	0.1441	0.1001	-0.0440***	0.3007	0.0132
Fraction with losses	0.1832	0.123	-0.0602***	0.0092	0.0006
High tech dummy	0.236	0.1462	-0.0898***	-0.0175	-0.0016
Log Age	2.8288	2.426	-0.4029***	0.0319	0.0128

Table 6

Table 6 shows estimates of firm-level net payout regressions of multinational (MNF) firms. Multinational firms are firms with material pre-tax foreign income in any of the last three years. Net payout is calculated as net payout as a fraction of operating income, for firms with positive operating income. The sample consists of all firms listed on Compustat from 1987 to 2018. We exclude firms not incorporated in the U.S. and financial firms and utilities (SIC codes 6000–6999 and 4900-4949, respectively) because of their statutory capital requirements and other regulatory restrictions. We also exclude firms with missing data for total assets (AT), dividends (DVC), and market capitalization (CSHO and PRCC_F). We then merge these observations with data from the Center for Research in Security Prices (CRSP) and restrict the sample to NYSE, AMEX, and NASDAQ firms with CRSP shares codes 10 or 11. Odd columns present results for all firms with available data and even columns present results for firms with positive net payout. All control variables are lagged relative to the dependent variable and all continuous variables are winsorized at the 1% and 99% levels. Details on all variables are provided in the Appendix. P-values are in parentheses; ***, ** and * denote significance at 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Market Leverage	-0.272***	-0.365***	-0.347***	-0.517***	-0.273***	-0.368***	-0.347***	-0.517***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(assets)	0.024***	0.013***	0.053***	0.051***	0.024***	0.015***	0.052***	0.051***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
OCF / assets	0.030***	-0.082***	-0.016	-0.051**	0.031***	-0.081***	-0.015	-0.051**
	(0.009)	(0.001)	(0.119)	(0.044)	(0.008)	(0.001)	(0.130)	(0.046)
Fixed assets / assets	-0.004	-0.008	-0.020	-0.114***	-0.002	-0.009	-0.017	-0.113***
	(0.677)	(0.595)	(0.362)	(0.002)	(0.801)	(0.549)	(0.438)	(0.002)
Tobin's q	-0.002	0.001	-0.015***	-0.016***	-0.002	0.001	-0.015***	-0.016***
	(0.599)	(0.815)	(0.000)	(0.001)	(0.588)	(0.785)	(0.000)	(0.001)
RD / assets	-0.370***	-0.250***	-0.337***	-0.576***	-0.368***	-0.237***	-0.331***	-0.574***
	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.004)	(0.000)	(0.000)
SGA / sales	0.063***	0.191***	0.049**	0.184***	0.063***	0.195***	0.048**	0.184***
	(0.000)	(0.000)	(0.010)	(0.001)	(0.000)	(0.000)	(0.011)	(0.001)
Advertising / sales	0.385***	0.240*	0.095	0.006	0.388***	0.240*	0.097	0.005
	(0.000)	(0.053)	(0.516)	(0.975)	(0.000)	(0.051)	(0.507)	(0.981)
Capex	-0.220***	-0.329***	-0.143***	-0.212***	-0.221***	-0.330***	-0.144***	-0.213***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cash / assets	0.305***	0.562***	0.345***	0.509***	0.303***	0.563***	0.344***	0.508***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Table 6, continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Acct Loss	-0.033***	0.021**	-0.019***	0.007	-0.032***	0.020*	-0.019***	0.006
	(0.000)	(0.041)	(0.000)	(0.432)	(0.000)	(0.053)	(0.000)	(0.451)
Hitech dummy	-0.022***	0.001	-0.019	-0.031	-0.023***	0.004	-0.021	-0.032
	(0.001)	(0.936)	(0.135)	(0.157)	(0.000)	(0.664)	(0.116)	(0.152)
logage	0.035***	0.007*	0.030***	0.026***	0.035***	0.008*	0.030***	0.026***
	(0.000)	(0.098)	(0.000)	(0.002)	(0.000)	(0.053)	(0.000)	(0.001)
2000s dummy	-0.009	0.034	-0.020*	-0.000	-0.010	0.037*	-0.021*	0.001
	(0.523)	(0.101)	(0.098)	(0.981)	(0.479)	(0.081)	(0.085)	(0.957)
2010s dummy	0.032	0.008	0.021	-0.014	0.026	0.009	0.014	-0.015
	(0.135)	(0.764)	(0.358)	(0.603)	(0.167)	(0.689)	(0.454)	(0.538)
2018 dummy	0.047***	0.029**	0.041***	0.031**	0.032**	0.010	0.023**	0.010
	(0.003)	(0.048)	(0.003)	(0.024)	(0.013)	(0.407)	(0.039)	(0.405)
MNF					-0.009	-0.016	0.001	0.000
					(0.327)	(0.142)	(0.896)	(0.984)
MNF * D2000s					0.009	-0.011	0.003	-0.005
					(0.478)	(0.388)	(0.836)	(0.752)
MNF * D2010s					0.021	-0.000	0.018	0.003
					(0.219)	(0.989)	(0.346)	(0.857)
MNF * D2018					0.051***	0.057***	0.053***	0.058***
					(0.000)	(0.000)	(0.002)	(0.001)
Constant	-0.032*	0.144***	-0.154***	-0.040	-0.029*	0.134***	-0.151***	-0.040
	(0.051)	(0.000)	(0.000)	(0.415)	(0.067)	(0.000)	(0.000)	(0.423)
Observations	73,077	41,352	71,721	40,075	73,077	41,352	71,721	40,075
Adjusted R-squared	0.125	0.134	0.251	0.285	0.126	0.135	0.251	0.285
Fixed Effect	None	None	Firm	Firm	None	None	Firm	Firm
Cluster	Firm&Year	Firm&Year	Firm&Year	Firm&Year	Firm&Year	Firm&Year	Firm&Year	Firm&Year

Table 7

Table 7 examines whether firms with high payouts have evolved differently from the other firms. The sample begins with all firms listed on Compustat from 1971 to 2018. We exclude firms not incorporated in the U.S. and financial firms and utilities (SIC codes 6000–6999 and 4900-4949, respectively). We also exclude firms with missing data for total assets (AT), dividends (DVC), and market capitalization (CSHO and PRCC_F). We then merge these observations with data from the Center for Research in Security Prices (CRSP) and restrict the sample to NYSE, AMEX, and NASDAQ firms with CRSP shares codes 10 or 11. High payout firms are defined in three ways. First, in Panel A we rank firms according to their net payout ratio, computed as net payouts divided by operating income, and compare firms in the top decile of payout ratios (dollar payout) to all other firms. Second, in Panel B we rank firms according to their dollar amount of net payouts, and compare firms in the top decile of payout ratios (dollar payout) to all other firms.. Third, in Panel C we examine firms whose payout is greater than that's year's operating income. Assets, market capitalization, cash/assets, OI/assets, NI/assets, market leverage, capex, R&D/assets, and acquisitions/assets are all lagged. Details on all variables are provided in the Appendix.

Panel A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	D2000s = 1			D2000s = 0				
	Toppay = 1	Toppay = 0	Diff. (1) vs. (2)	Toppay = 1	Toppay = 0	Diff. (4) vs. (5)	Diff. (1) vs. (4)	Diff. (2) vs. (5)
Net payout / OI	1.343	0.134	1.209***	0.871	0.078	0.793***	0.473***	0.057***
Assets ($2017)	5152.16	4036.83	1115.336**	1442.22	1590.33	-148.108	3709.945***	2446.501***
Market Cap ($2017)	8931.47	4567.33	4364.145***	1637.58	1260.98	376.602***	7293.891***	3306.348***
Age	18.522	16.259	2.263***	15.753	11.143	4.611***	2.768***	5.116***
Tobin's q	1.946	1.845	-0.101***	1.238	1.603	0.365***	0.708***	0.242***
Cash / assets	0.279	0.231	0.049***	0.171	0.139	0.032***	0.108***	0.092***
OI / assets	0.132	0.024	0.108***	0.141	0.089	0.052***	-0.009***	-0.065***
NI / assets	0.060	-0.073	0.133***	0.063	-0.009	0.072***	-0.003	-0.064***
Market Leverage	0.075	0.148	-0.073***	0.147	0.204	-0.057***	-0.072***	-0.056***
Capex	0.040	0.065	-0.025***	0.066	0.104	-0.038***	-0.026***	-0.039***
R&D / Assets	0.047	0.082	-0.035***	0.020	0.045	-0.025***	0.027***	0.037***
Acquisitions / assets	0.021	0.036	-0.015***	0.014	0.026	-0.012***	0.007***	0.010***
ΔCash / lag assets	-0.021	0.077	-0.098***	0.016	0.075	-0.059***	-0.037***	0.002
ΔAssets / lag assets	0.024	0.199	-0.174***	0.097	0.278	-0.182***	-0.072***	-0.080***
OCF / lag assets	0.098	-0.026	0.123***	0.067	-0.005	0.072***	0.030***	-0.021***
ΔDebt / lag assets	0.058	0.024	0.034***	0.044	0.046	-0.002	0.014***	-0.022***
Δleverage	0.022	0.005	-0.017***	0.029	0.008	-0.021***	-0.007***	-0.003***
Raw return	0.071	0.130	0.059***	0.086	0.170	0.085***	-0.014	-0.040***
EW abnormal return	0.013	0.074	0.062***	-0.054	0.018	0.071***	0.066***	0.057***
VW abnormal return	-0.025	0.020	0.045***	-0.080	0.007	0.088***	0.055***	0.013***
MNF	0.258	0.169	-0.089***	0.110	0.070	-0.040***	0.148***	0.099***

Panel B	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	D2000s = 1			D2000s = 0				
	Toppay = 1	Toppay = 0	Diff. (1) vs. (2)	Toppay = 1	Toppay = 0	Diff. (4) vs. (5)	Diff. (1) vs. (4)	Diff. (2) vs. (5)
Net payout ($2017)	3065.846	32.730	3033.116***	687.763	7.381	-680.382***	2378.083***	25.340***
Assets ($2017)	47266.654	1832.085	45434.569***	17910.150	598.349	-17311.801***	29356.504***	1233.736***
Market Cap ($2017)	58776.221	1937.618	56838.603***	14552.024	465.729	-14086.295***	44224.197***	1471.889***
Age	39.779	15.197	24.582***	37.795	9.934	-27.861***	1.984***	5.263***
Tobin's q	1.939	1.845	-0.093***	1.302	1.602	0.300***	0.637***	0.244***
Cash / assets	0.130	0.238	-0.108***	0.075	0.145	0.069***	0.054***	0.094***
OI / assets	0.177	0.021	0.155***	0.179	0.087	-0.092***	-0.002	-0.065***
NI / assets	0.085	-0.075	0.160***	0.071	-0.010	-0.081***	0.014***	-0.065***
Market Leverage	0.138	0.146	-0.008**	0.184	0.203	0.019***	-0.046***	-0.057***
Capex	0.051	0.064	-0.013***	0.090	0.103	0.012***	-0.039***	-0.038***
R&D / Assets	0.029	0.083	-0.054***	0.024	0.045	0.020***	0.005***	0.039***
Acquisitions / assets	0.026	0.036	-0.010***	0.019	0.026	0.007***	0.007***	0.010***
ΔCash / lag assets	0.004	0.076	-0.073***	0.004	0.076	0.072***	0.000	0.000
ΔAssets / lag assets	0.068	0.197	-0.130***	0.095	0.279	0.184***	-0.027***	-0.082***
OCF / lag assets	0.136	-0.029	0.164***	0.109	-0.008	-0.117***	0.027***	-0.021***
ΔDebt / lag assets	0.042	0.025	0.017***	0.036	0.046	0.011***	0.006**	-0.021***
Δleverage	0.011	0.005	-0.006***	0.006	0.009	0.002*	0.005***	-0.003***
Raw return	0.096	0.129	0.033**	0.159	0.167	0.007	-0.063***	-0.037***
EW abnormal return	0.037	0.073	0.037**	0.014	0.014	0.000	0.023***	0.059***
VW abnormal return	-0.004	0.019	0.023	-0.013	0.004	0.017	0.008	0.015***
MNF	0.487	0.157	-0.330***	0.360	0.059	-0.301***	0.127***	0.098***

Panel C	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	D2000s = 1			D2000s = 0				
	Netpay > OI	Netpay < OI	Diff. (1) vs. (2)	Netpay > OI	Netpay < OI	Diff. (4) vs. (5)	Diff. (1) v (4)	Diff. (2) v (5)
Assets ($2017)	2523.362	7848.818	5325.455***	565.873	2754.543	2188.670***	1957.489***	5094.274***
Market Cap ($2017)	3619.66	9066.58	5446.917***	407.13	2262.24	1855.113***	3212.536***	6804.340***
Age	15.54	23.86	8.314***	11.08	16.20	5.117***	4.461***	7.659***
Tobin's q	1.707	1.555	-0.152***	1.528	1.158	-0.370***	0.179***	0.397***
Cash / assets	0.330	0.137	-0.193***	0.225	0.100	-0.125***	0.105***	0.037***
OI / assets	-0.014	0.149	0.163***	0.005	0.163	0.158***	-0.020***	-0.015***
NI / assets	-0.087	0.053	0.140***	-0.050	0.060	0.110***	-0.037***	-0.007***
Market Leverage	0.090	0.161	0.072***	0.158	0.210	0.053***	-0.068***	-0.049***
Capex	0.053	0.060	0.007***	0.081	0.094	0.012***	-0.029***	-0.034***
R&D / Assets	0.076	0.023	-0.053***	0.050	0.018	-0.032***	0.026***	0.004***
Acquisitions / assets	0.020	0.039	0.019***	0.019	0.023	0.004***	0.001	0.016***
ΔCash / lag assets	-0.004	0.016	0.020***	0.032	0.021	-0.011***	-0.036***	-0.005***
ΔAssets / lag assets	0.022	0.104	0.082***	0.104	0.168	0.064***	-0.082***	-0.064***
OCF / lag assets	-0.062	0.108	0.170***	-0.082	0.081	0.162***	0.020***	0.028***
ΔDebt / lag assets	0.041	0.025	-0.016***	0.051	0.040	-0.011***	-0.010**	-0.015***
Δleverage	0.022	0.004	-0.018***	0.038	0.004	-0.034***	-0.016***	0
Raw return	-0.041	0.135	0.176***	-0.034	0.187	0.220***	-0.007	-0.051***
VW abnormal ret	-0.076	0.071	0.147***	-0.199	0.045	0.244***	0.124***	0.027***
EW abnormal ret	-0.115	0.030	0.144***	-0.186	0.014	0.200***	0.071***	0.015***
MNF	0.165	0.270	0.105***	0.047	0.125	0.078***	0.118***	0.145***

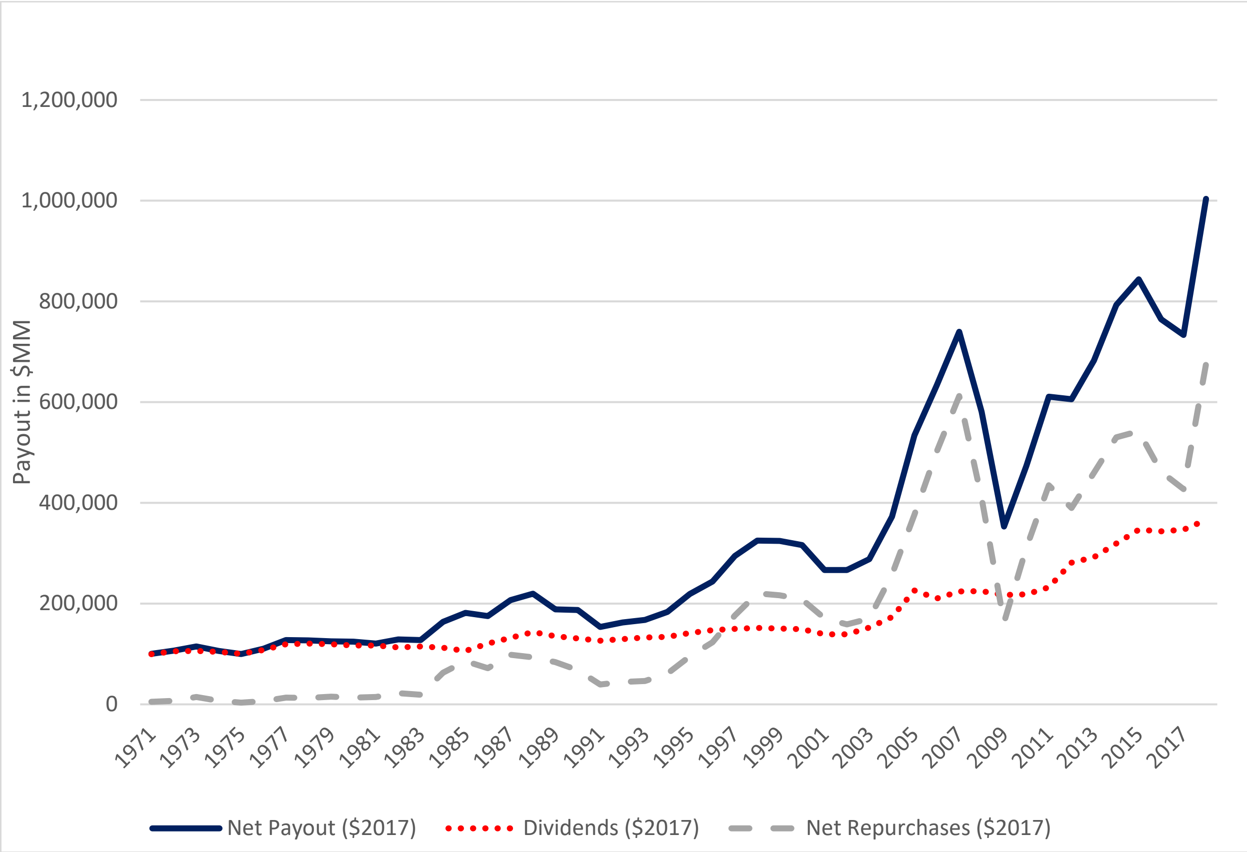


Figure 1. Aggregate Real Net Payouts

This figure shows aggregate real payouts (in 2017 $MM) from 1971 to 2018 for the sample of listed CRSP/Compustat firms described in Table 1. Repurchases are calculated as the purchase of common and preferred stock (PRSTKC) minus any reduction in the value of preferred stock; depending on availability, we use redemption (item PSTKRV), liquidating (item PSTKL), or par value (item PSTK) for the value of preferred stock. Net repurchases are equal to repurchases minus issuance of stock (item SSTK). If either calculation yields a negative value, repurchases are set to zero. Dividends are measured as cash dividends (DV). Net payout is defined as the sum of dividends and net share repurchases.

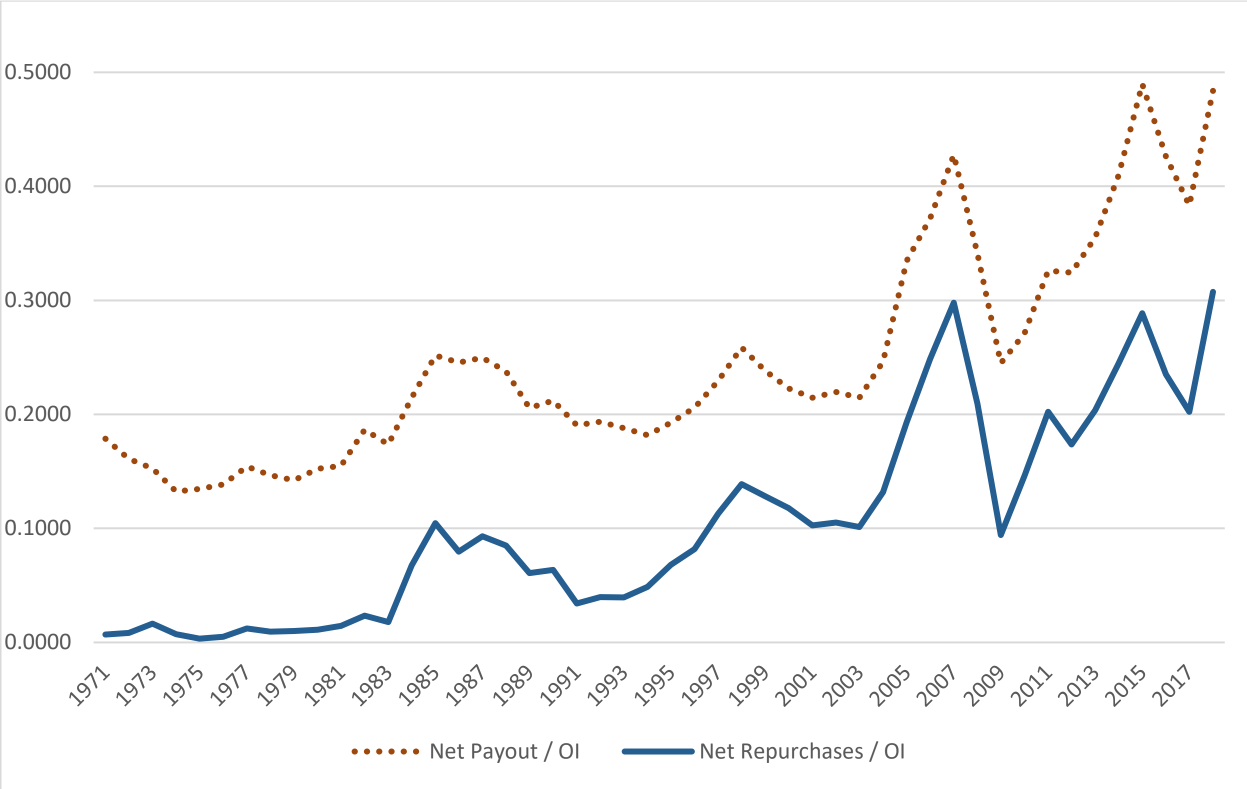


Figure 2. Net Payout rate

This figure shows the aggregate net payout rate for from 1971 to 2018 for the sample of listed CRSP/Compustat firms described in Table 1. Repurchases are calculated as the purchase of common and preferred stock (PRSTKC) minus any reduction in the value of preferred stock; depending on availability, we use redemption (item PSTKRV), liquidating (item PSTKL), or par value (item PSTK) for the value of preferred stock. Net repurchases are equal to repurchases minus issuance of stock (item SSTK). If either calculation yields a negative value, repurchases are set to zero. Dividends are measured as cash dividends (DV). Net payout is defined as the sum of dividends and net share repurchases. The net payout rate is the sum of net payout for all firms in the sample, divided by the sum of operating income for all firms in the sample.

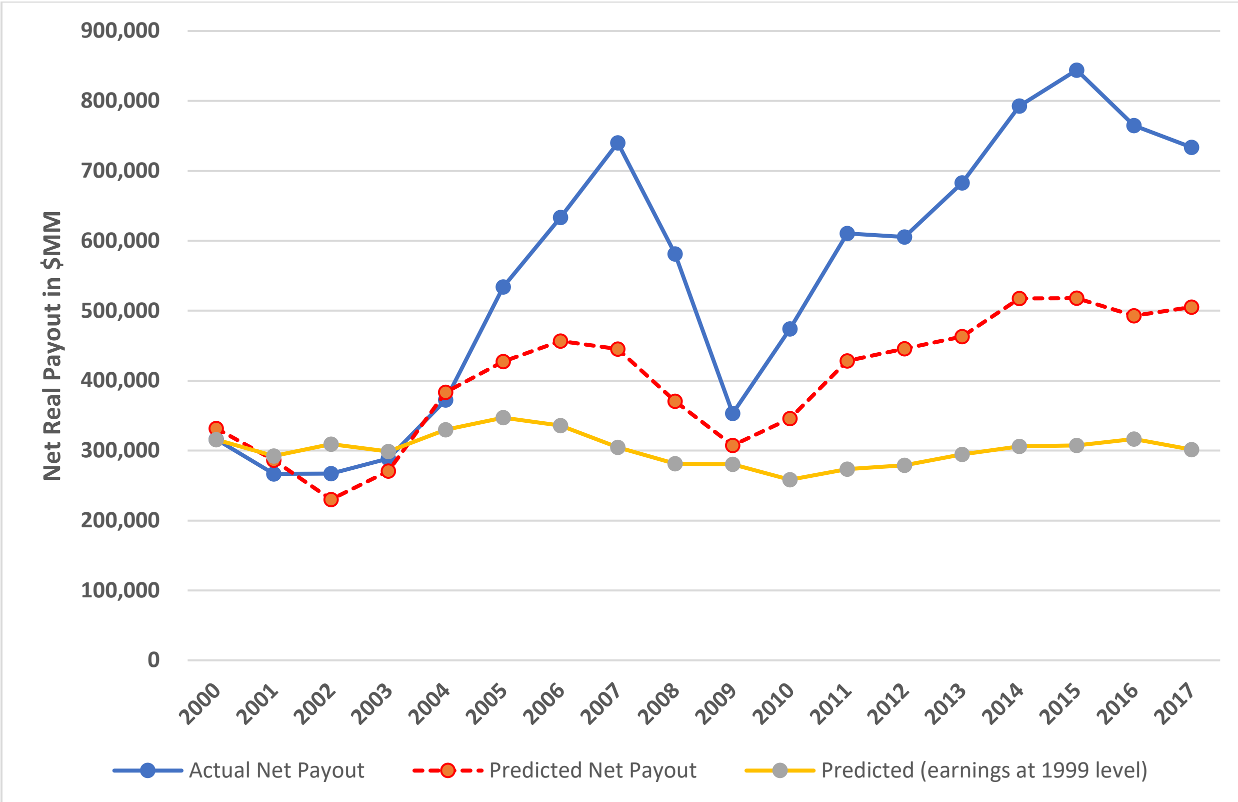


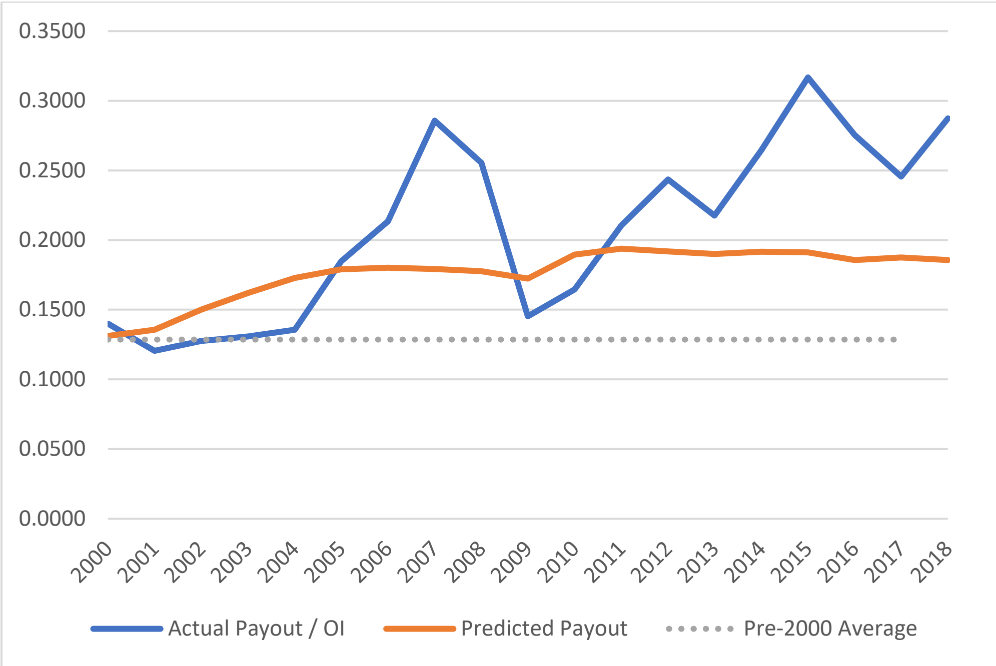
Figure 3. Aggregate Predicted versus Actual Net Payouts

This figure shows actual aggregate real net payout (in 2017 $MM) and predicted net payout from 2000 – 2017. Predicted net payout is estimated by applying the coefficients from the time-series regression model of aggregate real net payouts in Column (4) of Table 2 estimated using data from 1971 to 1999 to the aggregate values of the explanatory variables in each year from 2000 to 2017. The evolution of Predicted Net Payouts measures the effects of changing aggregate characteristics on net payouts.

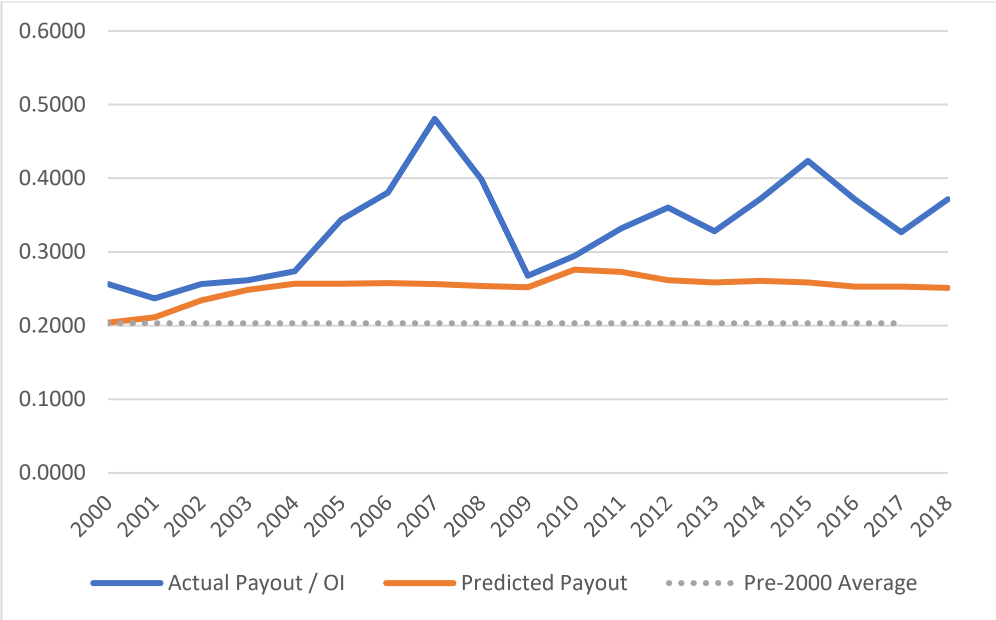
Figure 4. Average Net Payout Rate

This figure shows the average net payout rate from 1971 to 2018, where the payout rate is the ratio of net payout to operating income. Repurchases are calculated as the purchase of common and preferred stock (PRSTKC) minus any reduction in the value of preferred stock; depending on availability, we use redemption (item PSTKRV), liquidating (item PSTKL), or par value (item PSTK) for the value of preferred stock. Net repurchases are equal to repurchases minus issuance of stock (item SSTK). If either calculation yields a negative value, repurchases are set to zero. Dividends are measured as cash dividends (DV). Total (net) payout is then defined as the sum of dividends and (net) share repurchases. The firm-level net payout rate is equal to the firm's net payout, divided by its operating income, calculated for firms with positive operating income.

Panel A: All Firms



Panel B: Payers Only



Panel C: Median, Payers Only

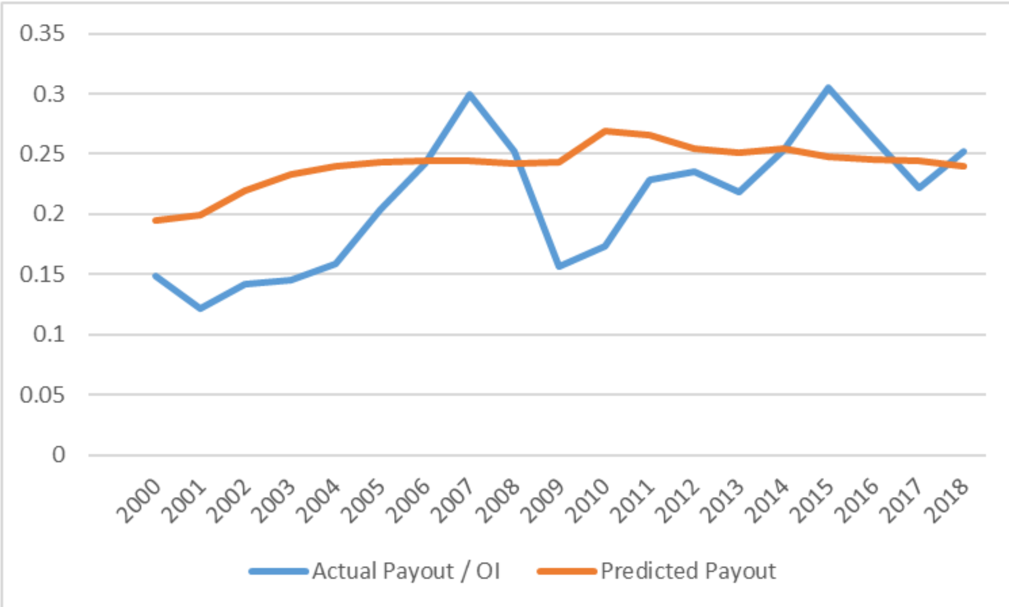


Figure 5. Average Predicted versus Actual Payout rates

This figure shows average actual net payout rates and predicted values of payout, where the payout rate is the ratio of net payout to operating income. Predicted values are calculated from the regression model shown in Column (1) of Table 4 estimated from 1971 to 1999 without fixed effects. The coefficients from the regression model are then used to calculate the predicted values from 2000 to 2018. In Panel A, the regression model is estimated for the full sample of firms with available data. In Panel B, it is estimated for firms with positive payout. In Panel C, the model is estimated based on firms with positive payouts and the median predicted payout is presented in each year.