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Does Firm Payout Behavior Serve as a Signal for Future Profitability?

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Claremont Mckenna College

Does Firm Payout Behavior Serve as a Signal for Future Profitability?

submitted to

Professor Benjamin Gillen

by

Michael Colangelo

for

Senior Thesis

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Contents

Abstract

In this paper I explore the potential signaling capability that payout behavior, in the forms of dividends and share repurchases, has on the profitability of a firm. To do so, I analyze the relationship that dividends paid, share repurchases, and total payout have with asset turnover, return on assets, and EBITDA margin across different time structures. Next, I aim to understand if there is a significant differential impact of negative payout growth compared to positive payout growth, on the growth of the same performance measures above. I found that an increase in share repurchases and total payout both lead to an increase in profitability; however, it is to such a small magnitude that these results are not economically impactful. Dividends do not reveal any clear relationship. Also, there is no clear differential impact of negative growth for any of the payout metrics studied. Reported payouts by firms may be correlated with performance to some extent, but ultimately do not serve as strong signals for future performance.

1. Introduction

The ability of firms to generate consistent profits is crucial for their survival and long-term success. One significant factor that can influence a company's financial performance is its payout behavior, which includes dividend payouts and share repurchases. The question arises, does firm payout behavior serve as a signal for future profitability?

Payout behavior is an important topic in finance, as it is a way for firms to distribute excess funds to their shareholders while also providing valuable information about the company's financial health. Dividends, for example, are a direct payment to shareholders and can signal to investors that the firm is financially stable and expects to continue generating profits in the future. Share repurchases, on the other hand, are a way for firms to reduce the number of outstanding shares and increase the value of each remaining share, which can also be seen as a signal of confidence in the firm's future performance.

A firm's dividend policy is typically more rigid when compared to its repurchasing activity. Once a firm begins to issue dividends, it is strongly incentivized to continue this behavior regardless of performance fluctuations. A dividend cut is one of the last activities a company will engage in during a turbulent period. Also, dividends are paid out on a regular basis, so investors can expect payments at consistent times intervals. Repurchases, on the other hand, are less routine and occur at more random times. Firms may undergo share buybacks with the hopes of consolidating ownership, preserving the stock price, or because they believe their stock is undervalued, among other reasons.[1] Share repurchases can be toned back, or increased, more seamlessly without as many consequences, hence creating an advantage when it comes to flexibility.

[1] Segal (2023) "Stock Buybacks: Why Do Companies Buy Back Shares?"

In 2021, both share repurchases and dividends paid out hit all-time highs, and in 2022 the upwards trend continued. However, in 2022 a new 1% tax on corporate share buybacks was instated, which may alter how firms choose to pay back their shareholders. With this, it is important to note that for investors, dividends are taxed as income, whereas stock appreciation through share repurchases does not face any tax until those gains are realized through the selling of the security[2]. It is evident that firms and investors communicate heavily through payout policy, as it has numerous implications on both stakeholders.

This study aims to investigate whether payout behavior can be used as a predictor of future profitability, specifically examining the relationship between payouts and financial performance measures. There have been countless studies on the impact of payout announcements on stock returns. This research helps us understand how firm news and payout behavior affects securities, but it does not analyze how actual firm payout policy in dollars may relate to the firm's profit generating capabilities. This study utilizes financial data from publicly traded firms and employ statistical techniques to analyze the relationship that exists between reported payout behavior and subsequent operating performance, if any.

It is important to understand the determinants of a firm's financial performance and the need to provide useful information to investors and stakeholders. Investors rely on payout behavior as a signal of the firm's future financial performance, and understanding this relationship can help them make informed investment decisions. This study will provide valuable information for investors in making investment decisions.

[2] Braun, "The New 1% Tax On Share Buybacks Will Not Have Intended Consequence Of Changing Corporate Behavior."

The study analyzes the 500 firms listed on the S&P 500 and their activity from 2012 – 2021. This study explores the dynamic relationship between profitability and payout behavior at zero, one, and two year lags. The largest relationship between payout behavior and operating performance exists within the same year, though even this relationship is not extremely economically impactful. When analyzing the data with a one-year lag in payout behavior, there is a statistically significant relationship that reveals payout behavior as a signal for future performance, though the magnitude of this is not large enough to serve as impactful. I find that payout activity does not serve as a reliable signal for profitability when observed under a two-year lag. Judging by the data, it seems likely this lack of relationship exists for more than 2 years of lag as well.

My results provide useful information regarding the relationship between firm payout policy, performance, and investors. First, it acknowledges that there is indeed a positive relationship between payout growth and future profitability, even though that effect is not large in magnitude. Second, it emphasizes previous literature that found economically significant results regarding payout announcements and stock performance. The stock performance is more directly related to and impacted by investors, so it makes sense that this relationship is stronger. Finally, share repurchases are most related to performance within the same year, and this can be attributed to the fact that repurchase decisions are more flexible. The relationship here may actually develop from the firm performance's effect on payout policy rather than the inverse.

The remainder of this paper proceeds as follows. The next section will discuss previous literature. Section 3 will describe the data and methods used in this study. Section 4 presents and interprets empirical results. Finally, Section 5 summarizes and concludes the study.

2. Literature Review

There is an array of previous literature on the nature of dividend and share repurchasing decisions by firms. Much of this research aims to understand why a firm may choose one or the other, and under what conditions they are most applicable. Jagannathan et al. (2000) explains that financial flexibility is the driving force behind the increase in share repurchasing as the method of paying back shareholders. Share repurchases are pro-cyclical, while dividends tend to increase steadily over time. The paper concludes that dividends are paid out of more permanent cash flows, while share repurchases are paid out of more temporary cash flows, indicating a volatility present in the cash flows of repurchasing firms. The decision to repurchase shares or pay dividends also tends to follow different signals from market performance. Repurchasing typically follows poor performance, while dividends tend to follow good performance.

Another leading hypothesis is that dividends and repurchasing shares are substitutes, to some extent at least. Miller and Modigliani (1961) concluded that the two are perfect substitutes, yet this claim is not consistent across all research and commonly disputed. There is, though, a tax incentive favoring share repurchasing, as capital gains tax is more favorable than that of ordinary income (under which dividends are taxed). This supports the gradual increase of share repurchases in relation to dividends for firms and individual investors, who would rather see the benefit realized in stock value. Lee and Rui (2009) study these explanations and conclude, just as in Jagannathan et al. (2000), that share repurchases are from temporary portions of earnings while dividends are not. Also, the study concludes that dividends and repurchasing shares are not perfect substitutes.

Brav et al. (2005) surveyed 384 financial executives along with more in-depth interviews to conclude that many managers favor repurchases because they are viewed as more flexible and can increase earnings per share. However, executives believe institutions are indifferent between

dividends and repurchases. The study ultimately provided minimal support for agency and signaling hypotheses of payout policy regarding dividends and share repurchases.

This research helps us to first understand the interrelatedness of dividends and share repurchases. Trends show that repurchases have risen and, in some form, replaced dividends over time. These theories help explain the why behind the decision between the two payout methods, but don't address the future implications associated with it.

Previous literature discusses the impact of dividends and share repurchases on stock performance. Regarding announcements, the information-signaling hypothesis indicates that firms experience positive market performance on announcements of stock repurchase tender offers (Howe et al., 1992). This research is backed by major studies such as Dann (1981), Masulis (1980), and Vermaelen (1981, 1984). Around this time period, Richardson et al. (1986) concluded that the announcements for dividends also showed an increase in firm value around the announcement, along with an increase in trading volume. More recently, a Thailand-based study (Suwanna, 2012) found that stocks prices increased significantly post-announcement and both abnormal return and cumulative abnormal return were statistically significant, supporting the dividend signaling theory. A UK-based study (Hasan, 2022) analyzed the effects of dividend announcements from 1990 to 2019 and found that dividend increases resulted in positive stock returns and dividend decreases resulted in reduced stock returns of comparable magnitude. These studies help explain the initial reaction (a short time period of days before, during, and after announcement) of markets to news. Further research dives deeper into the long-term stock performance of firms after the announcement of the two payout methods.

Ikenberry et al. (1995) examined performance following repurchase announcements in the period 1980 to 1990. The study yielded an average abnormal four-year buy-and-hold returns after

the initial announcement of 12.1%, and 45.3% when observing solely value stocks (repurchase due to undervaluation). Chan et al. (2004) looked at repurchase announcements from 1980 to 1996, and found a 4-year cumulative abnormal return average of 23.6%. Peyer and Vermaelen (2009) studied repurchase announcements from 1991 to 2001 and found a 4 -year cumulative abnormal return average of 24.2%. Fu and Huang (2015) studied repurchase announcements from 1984-2012, a more extensive time period, and reported 3-year excess returns from 5% to 10% post-announcement. This more recent study shows a reduction in returns following announcements when compared to prior years, perhaps due to the availability of information and investor understanding from the availability of resources and technological innovation. All of these studies strive to analyze the effect of the announcement, not the actual carrying out of the dividends or repurchases, on stock performance.

Further literature aims to explain the effect the announcement has on future operating performance of the firms (or in the case of operating performance, how the announcement may signal future profitability, as the announcement itself does not have any direct impact on the firm's daily profit-creating activities). These studies provide mixed results and are part of a less comprehensive research portfolio, as opposed to stock performance. Grullon and Michaely (2004) concludes that share repurchase announcements are not followed by subsequent improvements in annual operating performance from 1980 to 1996. However, it finds that repurchasing firms experience a reduction in systematic risk and cost of capital, which could support repurchasing over dividends. Lie (2005), utilizing quarterly data from 1981 to 2000, finds that firms show operating improvements for up to eight quarters relative to benchmark companies post-announcement, but mostly in firms that actually end up carrying out the repurchasing. Gong et al. (2008) find that abnormal returns and operating performance improve post announcement, but it is driven by pre-announcement downward earnings management. Chen and Wang (2012) report that unconstrained firms (financially) display higher post-buyback abnormal returns and operating performance. Shifting

to dividend announcement effects on operating performance, Crutchley et al. (2003) analyzes the effect special dividend announcements have on stock and operating performance from 1975 to 1996. They find that special dividend announcements have unexpectedly high earnings the same year of the announcement, but they decline significantly in the following years. The study concludes that investors cannot expect stock and operating performance pre-announcement to continue post-announcement. Finally, Lie (2005) found little evidence that earnings change following dividend decreases and omissions from 1980 to 1998, except that earnings seem to decrease significantly in the quarter of the dividend omission (only to recover within quarters).

3. Data and Methodology

For this study I will be exploring the relationship between dividends paid or shares repurchased by a firm and the firm's subsequent operating performance. There has been a plethora of studies that discuss the effect of announcements on future stock performance, but there seems to be less literature on the effect of yearly reported dividends and repurchases on operating performance.

To conduct this research, I will be looking at companies currently in the S&P 500 index, which is a market-capitalization-weighted index of about 500 leading publicly traded companies in the United States of America. This index is commonly referred to in order to assess the performance of U.S. securities, along with the overall stock market. Because market capitalization is the leading factor in determining this list, these companies make up roughly the 500 largest firms in the U.S., and thus are frequently utilized for research. They are mature and established firms, hence reducing variability or volatility in the data set as compared to another selection of U.S. firms to analyze.

After obtaining the set of 500 firms, I turned to collecting data on each. I used COMPUSTAT to generate yearly details and financials for each of the firms, from 2012 to 2021 specifically. Originally aiming to collect the most recent decade of data, I generated data from 2013 to 2022, but the 2022 data was not retrieved for some firms, most likely due to the differences in reporting across firms and industries. Therefore, the data set was adjusted back one year to look at the ten years from 2012 to 2021, while still providing a long enough time horizon to find sufficient results.

The first set of metrics are descriptive statistics on the firms themselves, describing size, industry, and financial makeup. I obtained both the GIC Industries identifier and the North American Industry Classification Code (NAICS) for the firms. The GIC Industries identifier is an

industry taxonomy that consists of 11 sectors, 24 industry groups, 69 industries and 158 sub-industries for publicly traded companies. The NAICS is another identifier, that groups companies by the type of economic activity they engage in for the purpose of statistical tracking and analysis within North America.

Although the 500 firms rank similarly in terms of market capitalization when compared to all public firms, there is still significant variance among them, hence the need to generate market value for each firm over the time period of the study. I also generated the following data for each:

- Total Assets
- Total Liabilities
- Total Shareholder's Equity
- Cash
- Debt-to-Equity Ratio

These metrics, grouped with industry classifications and market capitalization, give us sufficient background information on the firms we will be using to run our analysis. They show the size of the firms, how the firms are structured (capital structure), and how much cash they sit on (in this study we analyze two payout methods sourced from availability, or lack thereof, of cash).

I then collected data on each firm's spending on dividends and share repurchases over the same years. These metrics are, specifically:

- Total dividends
- Purchase of common and preferred stock
- Sale of common and preferred stock

Total dividends includes both cash and non-cash dividends. This is because in this study we will be analyzing payout, and what form that takes is not as much of a concern. How a firm chooses to issue dividends (cash or stock) should not impact the study, as firms are all constructed and operated differently, hence the decision to only look at total dividends. Through COMPUSTAT, retrieving the values for repurchases of both common and preferred stock yielded sufficient data, whereas when retrieving data for only common stock, very few data points were available. For those that did have data, the values were nearly identical for both data items. This, along with the fact that this study should analyze all repurchasing behavior reported by the firms, lead to the decision to omit the repurchasing of common stock data item, and analyze that of both common and preferred stock. I also included the sale of common and preferred stock to understand how the inverse decision by firms may signal future performance.

Using this data, I am able to generate year over year growth rates for both dividends and share repurchases. For the value of dividends paid, the floor has a value of zero. There is no inverse of paying dividends. Therefore, I can calculate the change in dividends paid each year to determine whether they are growing or being cut. Share repurchases are slightly more complicated. That is because a firm can reduce the dollar amount of stock purchased and simultaneously sell stock. Therefore, I will analyze the difference between stock purchased and sold (total stock purchased or sold) each year. This way, all inflows and outflows are considered in my analysis. I will also generate a data item that is the sum of total dividends and total stock purchased or sold, denoted by the variable TPAY (total payout). This will then remove the division between dividends and share repurchases, and simply look at the total payout by firms to shareholders. Through this variable, it no longer matters how a firm chooses to distribute its cash to shareholders, just that it is or is not to some extent. I will then calculate the year over year growth rate associated with this variable as well.

Finally, I collected data on the profitability of the firms in the same time period. The three metrics we will be looking at are:

- Total Revenue (TREV)
- Net Income/Loss (NI)
- Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA)

These metrics describe a firm's profit generating activity and give a sense of the trajectory of the firm's future. They are commonly used to determine the health of a company and drive future value. In my study, I will first scale each of these variables for each firm by dividing them by either the firm's total assets or total revenue. This will generate the following metrics:

- TREV/TA --> Asset Turnover (AT)
- NI/TA --> Return on Assets (ROA)
- EBITDA/TREV --> EBITDA Margin

By dividing by total assets or revenue, we remove the effect firm size would have on the magnitude of each profitability measure. With this, I will also generate growth rates for the three variables (AT Growth, ROA Growth, and EBITDA Margin Growth).

For my regression analysis, the payout data items will serve as the independent variables and the profitability data items above will serve as the dependent variables. The control variables used are:

- Inflation
- Log (Research and Development Expense)
- Log (Capital Expenditures)
- Log (Market Value)

These controls factor in macroeconomic effects, firm behavior, and firm size. Along with these controls, I will use the company and year data to analyze the results with fixed effects. See the summary statistics for the S&P500 companies below:

Table 1: Descriptive Statistics

	2012			2016			2021		
	Obs	Mean	SD	Obs	Mean	SD	Obs	Mean	SD
Asset Turnover	477	0.7933	0.73	490	0.698	0.63	499	0.6301	0.56
ROA	477	0.0592	0.08	490	0.0578	0.07	499	0.0784	0.08
EBITDA Margin	453	0.2371	0.16	466	0.2417	0.17	476	0.2641	0.26
Total Dividends	471	599.79	1,272	485	863.32	1,732	494	1,105	2,148
Shares Repurchased	482	493.89	1,961	496	828.88	2,436	500	1,502	6,106
Total Payout	471	1,104	2,891	485	1,710	3,742	494	2,635	7,179
Total Assets	477	58,045	203,983	490	65,096	212,100	499	88,808	286,060
Cash	468	2,763	8,660	474	2,712	7,413	484	4,407	14,793
Market Value	434	27,182	52,379	453	39,790	66,448	478	82,536	204,402
DE Ratio	477	4.92	48.26	490	4.97	33.88	499	1.014	27.1
R&D	275	738.54	1,633	283	953.78	2,245	292	1,533	4,798
Capex	476	1,180	3,006	489	1,221	2,703	498	1,498	3,998

Reported values in $ millions, except for ratio statistics (Asset Turnover, ROA, EBITDA Margin, DE Ratio in %)

Figure 1: Payout Policy Trends

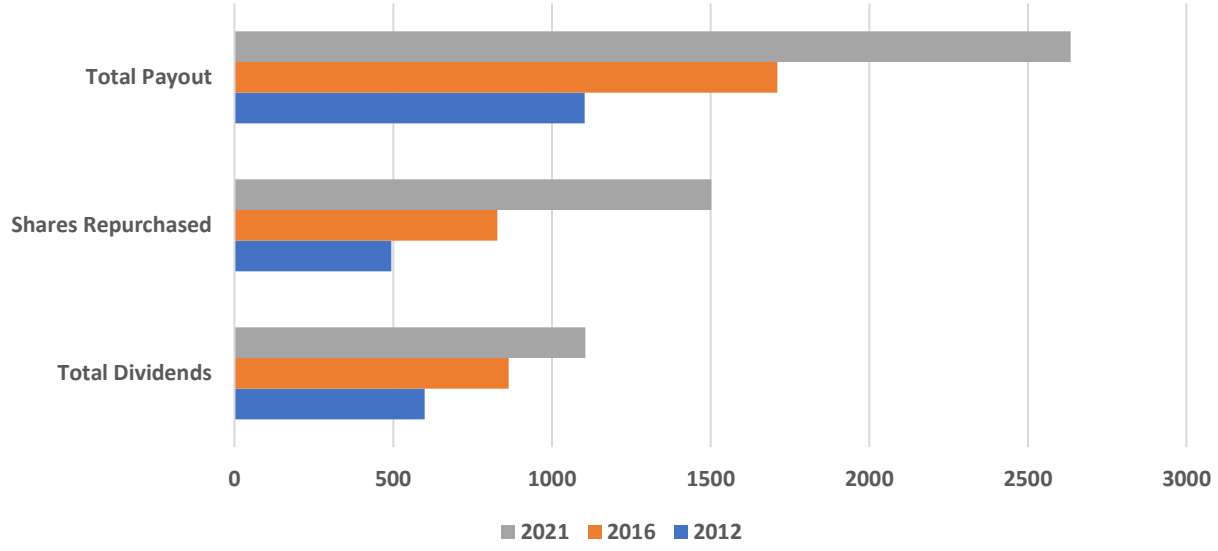
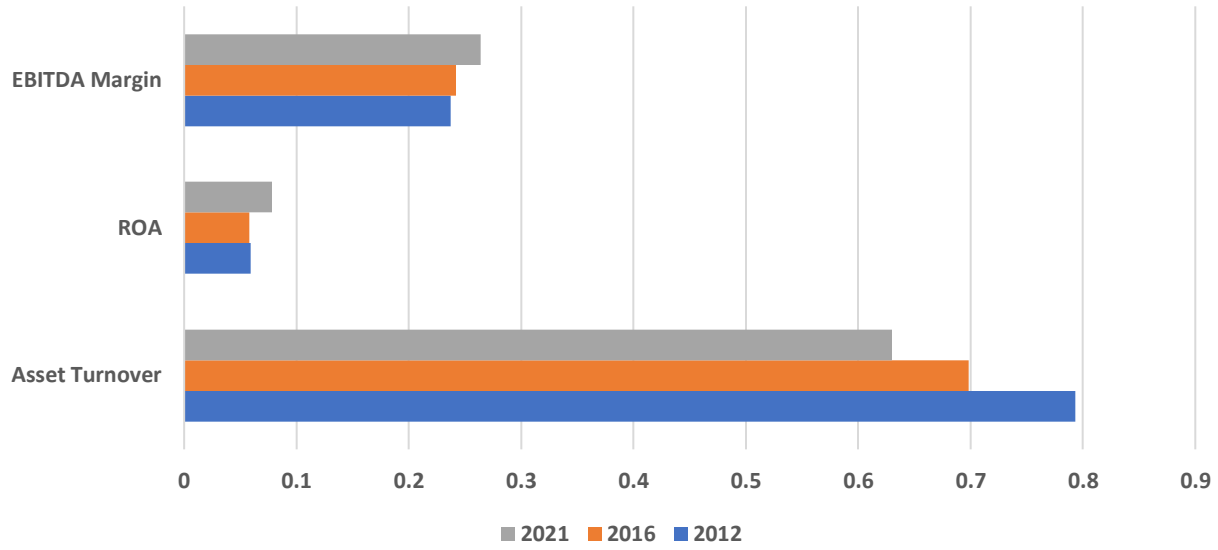


Figure 2: Profitability Trends



From the figures above, we see a gradual decline in asset turnover over the last decade, but increases in both return on assets and EBITDA margin over time. This reveals that firms have generally improved their operational efficiency. We also can see the monumental increases in both dividends paid out and shares repurchased. This confirms the earlier discussion on the prevalence of payout policy in today's business environment. We also can observe other firm descriptive statistics, such as size and other expenditures.

The goal of this study is to analyze how payout behavior changes may signal the future operating outlook for firms. Therefore, the independent variables describing payout activity will be lagged one year compared to the dependent variables describing operating performance. For example, 2015 dividend totals will be analyzed in conjunction with 2016 ROA. This way, we can determine if there is a relationship and signaling associated with payout behavior and operating performance. In order to generate a wider time range in the analysis, these regressions will also be run with a 2-year lag and a 0-year lag on the independent variables. Doing so will provide a more holistic understanding of the effects payout policy has or doesn't have on profitability.

3.1 Payout Behavior and Operating Performance

For the first part of this study, I will be analyzing the relationship between the payout methods and profitability metrics.

The base regressions are as follows:

$$y_{it} = \beta_i + \delta_t + \beta_1\big(\log\left(TotalDividends_{i(t-\tau)}\right)\big) + \gamma Controls_{it} + \varepsilon_{it}$$

$$y_{it} = \beta_i + \delta_t + \beta_1\big(\log\left(NetSharesRepurchased_{i(t-\tau)}\right)\big) + \gamma Controls_{it} + \varepsilon_{it}$$

$$y_{it} = \beta_i + \delta_t + \beta_1\big(\log\left(TotalPayout_{i(t-\tau)}\right)\big) + \gamma Controls_{it} + \varepsilon_{it}$$

$$y_{it} = \beta_i + \delta_t + \beta_1\big(\log\left(TotalDividends_{i(t-\tau)}\right)\big) + \beta_2\big(\log\left(NetSharesRepurchased_{i(t-\tau)}\right)\big) + \gamma Controls_{it} + \varepsilon_{it}$$

These regressions will allow us to analyze how each of the payout methods (dividends and share repurchases) and total payout relate to the three profitability metrics for the dependent variable *y*: AT, ROA, and EBITDA margin. Here, β_i denotes a firm fixed-effect, δ_t denotes a period fixed effect, and γ relates the control variables to the outcome. The coefficients of interest are β_1 and β_1, which characterize the relationship of payout policies on the profitability metric at lags $\tau \in \{0,1,2\}$.

Hypotheses

I hypothesize that the payout variables will vary in their reliability as signals of future profitability when lagged by a year.

Hypothesis 1: An increase in dividends will not foreshadow in an increase in profitability

Hypothesis 2: An increase in net shares repurchased will foreshadow in an increase in profitability

Hypothesis 3: An increase in total payout will foreshadow an increase in profitability

3.2 Differential impact of payout decrease vs payout increase

In the next part of the study, I will look into the differential impact of negative payout growth compared to positive payout growth. This will require the introduction of a binary variable for each metric: $1\{\Delta Dividend < 0\}$, $1\{\Delta Repurchases < 0\}$, and $1\{\Delta TotalPayout < 0\}$. These variables generate a value of 0 if the selected variable has a growth rate of 0% or greater, and a value of 1 if the growth rate is less than 0%. With this, the interaction between the binary and original variable (e.g., $\Delta Dividend$ x $1\{\Delta Dividend < 0\}$) will create the interaction variables.

The regressions will look as follows:

$$y = \beta_o + \beta_1(\Delta Dividend) + \beta_2(1\{\Delta Dividend < 0\}) + \beta_3(1\{\Delta Dividend < 0\} * \Delta Dividend) + \gamma Controls$$

$$y = \beta_o + \beta_1(\Delta Repurchases) + \beta_2(1\{\Delta Repurchases < 0\}) + \beta_3(1\{\Delta Repurchases < 0\} * \Delta Repurchases) + \gamma Controls$$

$$y = \beta_o + \beta_1(\Delta TotalPayout) + \beta_2(1\{\Delta TotalPayout < 0\}) + \beta_3(1\{\Delta TotalPayout < 0\} * \Delta TotalPayout) + \gamma Controls$$

This analysis will tell us if there is a significant differential impact of negative payout growth versus positive payout growth. The dependent variables, in this case, will be the growth rates of the profitability metrics: AT growth, ROA growth, and EBITDA margin growth.

Hypotheses

Hypothesis 1: There will be a larger, significant differential impact of negative dividend growth versus positive dividend growth on operating performance

Hypothesis 2: There will not be a significant differential impact of negative repurchases growth versus positive repurchases growth on operating performance

Hypothesis 2: There will be a larger, significant differential impact of negative total payout growth versus positive total payout growth on operating performance

3.3 Limitations

Looking at financial statements and in this case, specific uses of free cash flow, does create a sense of diffusion of responsibility. Simply by studying the annual reports of companies, one can deduce that these are complicated systems of functioning and reporting. Firms and the reasons behind their performance are extremely complex. Looking at dividends and repurchases and linking to the income statement may indeed reveal correlation, but it is difficult to know what may have occurred unexpectedly within each business during each year to have an effect on profitability. Also, looking at dividends and repurchases separately may return some shortcomings, as they are often discussed as substitutes (though this has been refuted as well). Therefore, a decrease in one and increase in the other may simultaneously support the hypothesis and refute it. Whether this is a

common occurrence will have an impact on the study, and the creation of the total payout variable (TPAY) hopes to mitigate this potential effect. Finally, by looking at just the top 503 firms that garner majority of attention from the public, the data set fails to factor in smaller, less visible firms that had they been included, the results may have been shifted one way or the other. Sample size and make-up is always a key contributor to shortcomings within research, however using the S&P 500 aims to find firms that act similarly in a similar playing field to mitigate this issue.

4. Empirical Results

4.1 Payout behavior and operating performance

For my primary analysis, I observed the relationship between the log of the payout methods and the operating performance metrics. Below is a reference to serve as the basis of my analysis, in which I regress asset turnover on each of my independent variables lagged by one year. This analysis was run for each dependent variable with all three lags.

Reference Tables: Asset Turnover – 1 Lag

Table 2.1: Total Dividends

VARIABLES	(1)	(2)	(3) Fixed Effects
Dividends (Log)	-0.0460***	0.00643	-0.0187
	(0.00248)	(0.0131)	(0.0225)
Inflation		-0.151	
		(0.277)	
R&D Expense (Log)		-0.0735***	-0.0381**
		(0.0126)	(0.0156)
Capital Expenditures (Log)		0.0706***	-0.0210
		(0.0149)	(0.0119)
Market Value (Log)		-0.0559**	0.0230
		(0.0198)	(0.0177)
Constant	0.968***	1.272***	
	(0.0248)	(0.0842)	
Observations	3,430	1,394	1,394
R-squared	0.009	0.090	0.894
Number of groups	414	173	173
Company FE			YES
Year FE			YES

Driscoll-Kraay standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2.2: Net Share Repurchases

VARIABLES	(4)	(5)	(6) Fixed Effects
Repurchases (Log)	0.00787	0.0517***	0.00842***
	(0.00565)	(0.00502)	(0.00197)
Inflation		-0.354	
		(0.192)	
R&D Expense (Log)		-0.101***	-0.0538*
		(0.0100)	(0.0259)
Capital Expenditures (Log)		0.0710***	-0.0182
		(0.0187)	(0.0126)
Market Value (Log)		-0.0624***	0.0345***
		(0.0113)	(0.00704)
Constant	0.739***	1.246***	1.862***
	(0.0600)	(0.0901)	(0.179)
Observations	3,065	1,461	1,461
R-squared	0.000	0.137	0.888
Number of groups	459	213	213
Company FE			YES
Year FE			YES

Driscoll-Kraay standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2.3: Total Payout

VARIABLES	(7)	(8)	(9) Fixed Effects
Total Payout (Log)	0.00240	0.0637***	0.00761
	(0.00308)	(0.00799)	(0.00577)
Inflation		-0.335	
		(0.214)	
R&D Expense (Log)		-0.0796***	-0.0284*
		(0.0100)	(0.0148)
Capital Expenditures (Log)		0.0530**	-0.0193
		(0.0194)	(0.0122)
Market Value (Log)		-0.0861***	0.0216**
		(0.00996)	(0.00839)
Constant	0.701***	1.328***	1.034***
	(0.0357)	(0.0653)	(0.0507)
Observations	3,809	1,690	1,690
R-squared	0.000	0.119	0.886
Number of groups	484	219	219
Company FE			YES
Year FE			YES

Driscoll-Kraay standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2.4: Total Dividends and Net Share Repurchases

VARIABLES	(10)	(11)	(12) Fixed Effects
Dividends (Log)	-0.0808***	-0.0113	-0.0417
	(0.00740)	(0.0143)	(0.0312)
Repurchases (Log)	0.0444***	0.0601***	0.00952***
	(0.00842)	(0.00500)	(0.00216)
Inflation		-0.393*	
		(0.200)	
R&D Expense (Log)		-0.104***	-0.0732***
		(0.0124)	(0.0188)
Capital Expenditures (Log)		0.0681***	-0.0174
		(0.0163)	(0.0163)
Market Value (Log)		-0.0676***	0.0338*
		(0.0176)	(0.0160)
Constant	1.020***	1.372***	
	(0.0367)	(0.114)	
Observations	2,489	1,137	1,137
R-squared	0.018	0.139	0.898
Number of groups	379	165	165
Company FE			YES
Year FE			YES

Driscoll-Kraay standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Each independent variable was regressed on its own, with controls present, and with controls as well as fixed effects. For asset turnover and a one-year lag (above), the only significant variable is shares repurchased. The significance and economic implications will be discussed further below with the other results generated. As mentioned, I performed this method of analysis for each combination of dependent variables and lags. In order to better understand the data, relationships, and implications, the results from the replicated analysis above were consolidated into data tables. Below are the resulting coefficients and significance of the analyses run with both controls and fixed effects in play.

Base Regression Results

Table 3: Asset Turnover

	Lag 2	Lag 1	Lag 0
Log Dividends	5.25e-05	-0.0187	-0.0335*
	(0.0172)	(0.0225)	(0.0172)
Log Repurchases	0.00239	0.00842***	0.0221***
	(0.00297)	(0.00197)	(0.00279)
Log Total Payout	0.00103	0.00761	0.0234***
	(0.00354)	(0.00577)	(0.00567)

Includes Controls and Fixed Effects
Driscoll-Kraay Standard Errors in Parentheses
*** p<0.01, ** p<0.05, * p<0.1

It is evident from the table above that payout behavior lagged by two years does not have any significant impact on asset turnover.

Observing the data for one lag, we see that share repurchases is the only significant variable, at the 5% level. This means that a 1% increase in share repurchases will result in a .00842 percentage point increase in asset turnover in the following year.

Looking at the data for no lag, or within the same year, we see significance across all independent variables, at different levels. Dividends are significant at the 10% level and the coefficient implies that a 1% increase in dividends will result in a decline in asset turnover of .0335 percentage points. Both repurchases and total payout are extremely significant, at the 1% level, with coefficients of .0221 and .0234 respectively. These result in similar percentage point increases for asset turnover.

Although significance exists for both one lag and no lag, the coefficients are not extremely economically significant. According to these results, if repurchases doubled, or increased by 100%, asset turnover would increase by .8 percentage points in the following year. While that is some movement, it is not enough to support the claim that reported payout is a strong and worthy signal

for future profitability. Within the concurrent year, the coefficients imply a 100% move in repurchases and total payout will result in roughly a two percentage point increase, which is again not extremely economically significant. It is however, important to note that the data with no lag is most significant and large in magnitude.

Also, repurchases is the most significant independent variable, displaying significance at the 5% level for one lag, and 1% level for no lag. Dividends does not seem to have much of an effect on asset turnover across all lags.

Table 4: Return on Assets

	Lag 2	Lag 1	Lag 0
Log Dividends	0.00290	-0.0107**	0.00444
	(0.00651)	(0.00433)	(0.00687)
Log Repurchases	0.00235	0.00330***	0.00763***
	(0.00179)	(0.000415)	(0.00107)
Log TotalPayout	0.00298	0.00322*	0.00915***
	(0.00143)	(0.000716)	(0.00152)

Includes Controls and Fixed Effects
Driscoll-Kraay Standard Errors in Parentheses
*** p<0.01, ** p<0.05, * p<0.1

We see from the table above that payout behavior lagged by two years does not have any significant impact on return on assets, just as was the case for asset turnover.

Observing the data for one lag, we see significance across all independent variables, at different levels. Dividends are significant at the 10% level and the coefficient implies that a 1% increase in dividends will result in a decline in ROA of .0107 percentage points. Total payout is also significant at the 10% level and results in an increase in ROA of .00322 percentage points. Repurchases is much more significant, at the 1% level, and indicates an increase in ROA of .00330 percentage points.

Looking at the data for no lag we see significance for repurchases and total payout at the 1% level. Repurchases displays a coefficient of .00763 and total payout displays a coefficient of .00915. Total payout has a slightly larger relationship with operating performance than repurchases within the same year.

Again, repurchases is the most significant variable, displaying significance at the 1% level for both one lag and no lag. Dividends is again not very significant and does not seem to have an impact. Total payout shows more significance with ROA than the prior relationship with asset turnover.

These results, although more significant holistically, display even smaller coefficients, making them even less economically significant.

Table 5: EBITDA Margin

	Lag 2	Lag 1	Lag 0
Log Dividends	2.62e-05	0.00449	0.00698**
	(0.00400)	(0.00331)	(0.00237)
Log Repurchases	0.000643	0.00282***	0.00443***
	(0.000493)	(0.000646)	(0.000793)
Log Total Payout	0.00181	0.00459***	0.00945***
	(0.00121)	(0.000997)	(0.00105)

Includes Controls and Fixed Effects
Driscoll-Kraay Standard Errors in Parentheses
*** p<0.01, ** p<0.05, * p<0.1

We see from the table above that payout behavior lagged by two years does not have any significant impact on EBITDA margin, just as was the case for the previous two profitability measures. This allows us to reasonably conclude the relationship between payouts and profitability must exist within a year or less.

Observing the data for one lag, we see significance for repurchases and total payout at the 1% level. Repurchases display a coefficient of .00282 and total payout displays .00459. Total payout has a fairly larger effect on EBITDA margin when compared to repurchases.

Looking at the data for no lag we see significance for repurchases and total payout at the 1% level again, and for dividends at the 5%. Repurchases displays a coefficient of .00443 and total payout displays a coefficient of .00945. Total payout again has a larger coefficient when compared to repurchases, this time over double the value. Dividends are less significant as mentioned, and displays a coefficient of .00698. This coefficient is positive, while prior coefficients were negative. This reveals that dividends have a varying impact on different profitability measures. This, paired with the generally low significance, leads me to conclude that dividends are not a great signal for future performance and doesn't display a clear relationship.

In the case of EBITDA margin, repurchases and total payout show the same level of significance across lags (1% level for both one lag and no lag). As mentioned, the impact is larger for total payout than with repurchases.

These results, although significant, are again relatively economically insignificant. The percentage point movements for each 1% movement in repurchases or total payout are not enough to confirm that payout behavior is a quality or worthy signal for future performance.

4.2 Differential impact of payout decrease vs payout increase

Below are the results for the second part of the study, which analyzes the differential impact of payout decreases compared to payout increases. The "decrease" variables act as the binary variables with values of 0 or 1, and will affect the intercept of the relationship. The interaction variables act as the interaction between the payout method growth rate and the binary variable. Hence, it analyzes only zero or negative growth rates. This will affect the slope or multiplying factor of the relationship. For the purpose of this study, this interaction term will be the focus, as it displays the differential impact between negative and positive payout growth rates.

Table 6: AT Growth

	Lag 2	Lag 1	Lag 0
ΔDividends	-0.00213	0.00271	-0.00677
	(0.0102)	(0.00607)	(0.00899)
1{ΔDividends < 0}	-0.00192	0.00739	-0.000620
	(0.0185)	(0.0126)	(0.00468)
ΔDividends*1{ΔDividends < 0}	0.0637	-0.0199	0.0117
	(0.0366)	(0.0234)	(0.0436)
ΔRepurchases	-0.00438	-0.00510*	0.00187
	(0.00453)	(0.00299)	(0.00260)
1{ΔRepurchases < 0}	0.0114*	0.00435	-0.0367**
	(0.00567)	(0.00340)	(0.0121)
ΔRepurchases *1{ΔRepurchases < 0}	0.00497	-0.00635*	0.0167
	(0.00970)	(0.00334)	(0.0133)
ΔTotal Payout	0.00438	0.00242	0.0101*
	(0.00745)	(0.00586)	(0.00548)
1{ΔTotal Payout < 0}	0.0147	0.00257	-0.0294*
	(0.00804)	(0.0108)	(0.0130)
ΔTotal Payout *1{ΔTotal Payout < 0}	0.0111	-0.0356	-0.00443
	(0.0117)	(0.0260)	(0.0187)

*** p<0.01, ** p<0.05, * p<0.1

Table 7: ROA Growth

	Lag 2	Lag 1	Lag 0
ΔDividends	0.00494	-0.00639	0.00463
	(0.00627)	(0.00871)	(0.00629)
1{ΔDividends < 0}	0.00115	-0.00505	0.0165*
	(0.00746)	(0.00908)	(0.00803)
ΔDividends*1{ΔDividends < 0}	0.0362	-0.0328*	0.0148
	(0.0304)	(0.0162)	(0.0133)
ΔRepurchases	0.000309	0.000711	-0.00120
	(0.00139)	(0.00172)	(0.00178)
1{ΔRepurchases < 0}	0.00508	0.00678***	-0.0166***
	(0.00289)	(0.00193)	(0.00340)
ΔRepurchases *1{ΔRepurchases < 0}	0.00282	0.000916	0.000145
	(0.00249)	(0.00221)	(0.00227)
ΔTotal Payout	0.00251	0.00600	0.00260
	(0.00454)	(0.00375)	(0.00317)
1{ΔTotal Payout < 0}	0.00515**	0.00467	-0.0119***
	(0.00165)	(0.00468)	(0.00351)
ΔTotal Payout *1{ΔTotal Payout < 0}	0.0107*	-0.0115*	-0.0187***
	(0.00440)	(0.00558)	(0.00500)

*** p<0.01, ** p<0.05, * p<0.1

Table 8: EBITDA Margin Growth

	Lag 2	Lag 1	Lag 0
ΔDividends	0.000222	0.00499**	-0.000182
	(0.00182)	(0.00238)	(0.00189)
1{ΔDividends < 0}	-0.00500	0.00161	0.000972
	(0.00470)	(0.00472)	(0.00381)
ΔDividends*1{ΔDividends < 0}	-0.00863	-0.0191**	-0.00520
	(0.0135)	(0.00608)	(0.00825)
ΔRepurchases	-0.000206	0.00234**	-0.00380**
	(0.000939)	(0.00114)	(0.00191)
1{ΔRepurchases < 0}	0.00247	0.00149	-0.000628
	(0.00303)	(0.00370)	(0.00555)
ΔRepurchases *1{ΔRepurchases < 0}	0.00536**	-0.00524**	0.00487
	(0.00188)	(0.00232)	(0.00283)
ΔTotal Payout	-0.00123	0.00440**	0.00360
	(0.00206)	(0.00199)	(0.00268)
1{ΔTotal Payout < 0}	0.00185	0.00126	-0.00253
	(0.00193)	(0.00343)	(0.00337)
ΔTotal Payout *1{ΔTotal Payout < 0}	0.0183*	-0.0122*	-0.0312**
	(0.00755)	(0.00640)	(0.0121)

*** p<0.01, ** p<0.05, * p<0.1

When analyzing our interaction variables, I find only a few significant results across all variables and lags. With this, the coefficients associated with these significant results are at times positive and at times negative, which makes it difficult to draw any firm conclusions regarding the impact, if any, that exists. Ultimately, the results are not consistent or significant enough to conclude that there is a noteworthy differential impact of payout decreases on operating performance growth compared to payout increases.

5. Conclusion

I find that payout activity does not serve as a reliable signal for profitability when observed under a two-year lag. The relationships between payout behavior and firm performance then relates on a tighter time horizon and does not have long-term implications. When payout behavior is observed with a one-year lag, a relationship emerges. Share repurchases and total payout have positive significant results across the three profitability measures. Repurchases were extremely significant (at the 1% level) for all three profitability measures, whereas total payout was fairly significant. Total payout was significant at the 10% level for ROA and 1% for EBITDA Margin. This means that an increase in share repurchases and total payout results in an increase in operating performance in the following year. However, for repurchases, a 1% increase only translated to an increase in performance of about .003 to .008 percentage points across the three profitability measures. Similarly, a 1% increase in total payout only translated to an increase in performance of roughly .003 to .0045 percentage points across ROA and EBITDA margin. Therefore, the relationship observed is not one that leads us to conclude that reported payout serves as a strong signal in the following year, even though the results are significant. Dividends paid are significant for only return on assets (at the 10% level) for a one-year lag, so they do not have a very significant

relationship with future performance. Finally, with no lag, we see the most significance. For repurchases and total payout, the results are significant at the 1% level for all performance measures. An increase in repurchases results in an increase in performance of about .004 to .02 percentage points. An increase in total payout results in an increase in performance of about .009 to .02 percentage points. Dividend activity does display some fairly significant results; however, these results are inconsistent and do not tell us much. It is negative and significant at the 10% level and positive and significant at the 5% level for EBITDA Margin.

Although different analyses were run for different time horizons, the focus of this study was to analyze the signaling ability of the payout metrics, specifically at the one-year lag time structure. Allow us to revisit my hypotheses.

For part 1, my hypotheses that share repurchases and total payout would foreshadow future profitability are supported by the data, but as mentioned, the impact is not large enough to be economically significant. My hypothesis that dividends would not be a reliable signal is also supported by the data.

For part 2, my hypotheses that the differential impacts of negative dividend growth and total payout growth would be significant cannot be confirmed by the data. My hypothesis that there would not be a differential impact of negative repurchasing growth is supported by the study.

Payout behavior seems to have little impact on firm operations and performance, and more on firm valuation. As previous studies have mentioned, payout announcements and activity have significant effects on stock value. It may be that because investors and firms interact mostly through the equity markets, that is where the effects of payout policy lie mostly. Perhaps payout policy in general is influenced more by investor relation and less by firm performance. This would explain the results of this study in conjunction with results from prior studies regarding payout policy impacts.

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