

**The Effect of Share Buyback Taxes on Corporate Payout Decision-Making: A Case Study on the IRA Share Buyback Tax**

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## **Abstract**

This paper investigates the impact of a change in taxation on share buybacks introduced in 2023 by the Biden Administration through the Inflation Reduction Act. By using data from the Center for Research in Security Prices (CRSP) and S&P Compustat Capital IQ merged databases, we studied whether the law affected firm's overall payouts, capital expenditures and distribution of payouts between dividends and share buybacks. We employed a difference-in-difference technique with a treatment group composed of non-financial members of the S&P 500 and a control group composed of non-financial members of the Stoxx 600 between 2020 and 2023. Results indicate that the 1% excise tax led to a significant decrease in total shareholder payouts, did not affect capital expenditure spend and did not affect the ratio of dividends to buybacks in the overall mix of payouts. These results have implications for corporate decision makers and policymakers as political instability and the willingness to tax corporations grows across Western societies.

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## 1. Introduction

Following the COVID-19 pandemic and the widespread implementation of government stimuli, the global economy experienced significant growth despite the difficulty that the pandemic provided. Central Banks decided to intervene to reduce inflationary pressures by increasing interest rates, which placed a dampening effect on global investment and more focus on internal restructuring procedures. In order to not have low-income households face the brunt of rising costs from inflation, the American Congress delivered the Inflation Reduction Act (IRA) which was intended to reduce some of American Households' biggest expenses such as Healthcare and Energy (Boyle, 2023) whilst providing jobs for the unemployed by providing favorable conditions for companies to invest in domestic projects and provide employment instead of paying out earnings to shareholders.

As part of the IRA, the act introduces a 1% tax on share buybacks by public U.S. Corporations. This measure is designed to disincentivize companies from pursuing extensive share repurchase programs as a payout method for shareholders and encourage them to reinvest their profits back into their operations and workforce instead. The introduction of this tax is part of broader efforts to promote economic growth and innovation, while also aiming to reduce the U.S. budget deficit. Furthermore, this initiative reflects a significant policy shift towards balancing shareholder rewards with long-term corporate investment and economic stability.

We were intrigued by the potential impact that a tax could have on company payout decisions and the link to the Modigliani, Miller theory (1961) which stated that the value of the firm should not depend on how it rewards its shareholders. In order to investigate this, we decided to collect data on both American and European companies with data points spanning the years 2020-2024 with the aim to understand whether the tax change had any effect on these companies' payout decisions, whether it be dividends, share buybacks, or capital expenditure. We used OLS regressions adjusting for company- and time-fixed effects to see if our data points held any statistical significance.

The remainder of the paper is structured as follows. Section 2 discusses the history and previous research of dividends, share buybacks, preference between the two and introduces the fundamentals of the IRA tax law. Section 3 describes the dataset, cleaning procedure used, and variables. Section 4 discusses the regression models used. Section 5 presents the results, interprets them and discusses their implication. Section 6 analyses the key limitations useful in analysing the relevance and replicability of this paper. Section 7 concludes this paper.

## 2. Theoretical Framework

In this section we analyze the pertinent theory on the topic of payout methods to shareholders by companies. We begin by analyzing dividends and buybacks separately and then try to understand preferences among executives and what the key drivers of the payout strategy are. Finally, we briefly outline the Inflation Reduction Act (IRA) and the share buyback tax that it has imposed on corporations as of the 1<sup>st</sup> of January 2023.

### 2.1 The History of Dividends

The act of a company paying a dividend to its shareholders exists since the creation of the first companies. The Dutch East India company was the first listed company to pay a regular dividend (Dorling Kindersley Limited, 2014) and did so for more than 100 years.

The objective of a dividend payment is to distribute part of, or all of the profits generated by a company to its shareowners, thereby rewarding them for the risk they have taken by investing in it. The distribution of profits can be done in cash or in kind, through the distribution of shares equal to the value of the profit distribution. Another form of cash distribution to shareholders that has emerged and gained prominence in the last 20 years are share buybacks. The principle of share buybacks is simple: firms use cash available on balance sheet to buy their shares on the open market. In certain cases, firms might approach large shareholders to buyback a significant number of shares in one instance. A recent example of that is L'Oréal's acquisition of 4% of its shares owned by Nestlé in 2021 (Reuters, 2021). By doing so, they reduce the share count, thereby increasing the value of each outstanding share.

This method first appeared in the United States during the 20<sup>th</sup> century. However, firms stayed away from this method of payment, fearing that they would be violating the anti-market manipulation provisions of the 1934 SEC Act (Chen & Obizhaeva, 2022). Following the passing of the SEC Rule 10b-18 in 1982, during the Reagan Administration, buybacks increased significantly and became the main source of distribution in dollar value in 1998 (Grullon & Ikenberry, 2000). Additionally, these authors show that the proportion of companies that did buybacks rose from 27% in 1972 to 84% in 2000 while in the same period, the proportion of companies that paid dividends decreased from 60% to 20%.

Fama and French (Fama & French, 2001) show that in the last quarter of the 20th century, a decreasing number of firms paid dividends, from 52.8% in 1973, to a peak of 66.5% in 1978, to a low of 20.8% in 1999, before the dot com bubble burst. They ask themselves two questions: What are the characteristics of dividend payers? And is the decline in the number of dividend-paying firms due to a change in the

mix of firms that are listed or is it due to a change in the behavior of the firms that had the characteristics of dividend payers?

Dividend payers share three characteristics: their larger size (as much as 10 times as large as non-payers), their higher profitability and their lower level of investments. The explanation given for the decrease in the proportion of firms paying dividends is a change in the mix of firms listed on exchanges with low profitability, small size, and high investments characteristics. However, this is only part of the story. The authors also find that firms' perception of the benefits of dividends has changed, but mainly in the group of former dividend payers and firms that have never paid and not of existing dividend payers, which results in a lower propensity to pay a dividend. Finally, they note that the rise in share repurchases is not the main reason for the decrease in dividends as buybacks are largely done by existing dividend payers.

## **2.2 Existing Theory on Dividends**

The existing theory on dividends and dividend payments supports that the value of companies should not depend on them paying dividends or the size of these dividends. For instance, Miller and Modigliani (1961) have shown that in a world with perfect capital markets (equal and costless access to information for all market participants, no taxes and especially no difference in taxes between distributed and undistributed profits or between income and capital gains taxes, no trading fees, no market participant is large enough to impact prices), rational behavior (investors do not care whether they become more wealthy through capital appreciation or through a cash payment) and perfect certainty ("complete assurance on the part of every investor as to the future investment program and the future profits of every corporation"), the dividend policy of a firm is irrelevant to its value and to the total return it generates for its shareholders. Said differently, Miller and Modigliani believed that the value of the firm should not depend on how it rewards its shareholders but how efficient and productive its assets are.

However, contrary to what Miller and Modigliani had theoreticized, numerous empirical studies have shown that firms that pay dividends are rewarded by the market with lower or higher valuations. This idea is called the "dividend puzzle" (Black, 1976) and is one of the most debated topics by academics and practitioners in corporate finance.

Three broad explanations have been given by researchers as to why companies pay dividends and why investors prefer certain dividend paying practices. These explanations are based on market imperfections or frictions that are excluded by Miller and Modigliani's model.

The first explanation is that of taxes. Certain jurisdictions offer lower tax rates for capital gains compared to dividend payments (which are usually taxed like income taxes) and thus, firms would be willing to pay lower dividends to attract this tax “clienteles”. Different results have been found by researchers on that. Brennan (1970) created a model supporting the idea that investors should require higher pre-tax returns for firms that pay a higher proportion of their profits in dividends to compensate for the higher tax bill. Stapleton (1972) developed a model considering the effect of corporate and personal taxes while still assuming certainty, perfect capital markets and investor rationality, the original assumptions of Modigliani and Miller. He concluded that high-tax paying investors can gain higher net of taxes returns by holding shares of firms with lower payouts and that low-tax paying investors should prefer firms with higher payouts. However, empirical tests of the model go against this logic. Black and Scholes (1974) and Miller and Scholes (1982) also do not find any relationship between the dividend yield and expected pretax returns. Contrary to that, Litzenberger and Ramaswamy (1979) and Kalay and Michaely (2000) find a relationship between the dividend yield and pretax returns. Finally, Jeong (2013) studies the determinants of dividend smoothing in Korea, a practice originally documented by Lintner (1956) which involves raising or cutting the dividend only when the changes in earnings appear to be certain and permanent. Dividend smoothing can be influenced that a firm’s characteristics such as its industry but also by the tax of the jurisdiction in which it operates. He shows that Korea’s particular tax system where capital gains on listed firms are not taxed and dividend are taxed at 15.4%, influences the degree of dividend smoothing. More specifically, he shows that there is a significant positive relationship between dividend income tax and the degree of dividend smoothing.

The second explanation is that of agency costs. The logic of this explanation is rooted in the principal-agent problem. The principal (in this case the shareholder), and the agent (in this case the CEO) do not have the same interest in the management of the company. For instance, the shareholder cannot control everything that the management does with the company entrusted to him. Thus, shareholders would prefer to restrict the cash that the management team has at its disposal as this would have a disciplining effect on the management and subject it to regular scrutiny of the shareholders. Several research papers support this explanation. Easterbrook (1984) argues that by paying dividends, firms force management teams to raise funds more frequently on capital markets (as they do not accumulate cash) for projects. Jensen (1986) also argues that dividends can act as a tool, forcing managers to funnel cash out of firms and limiting investments into suboptimal projects that are not in the interest of shareholders. Building on this idea, John et al. (2011) show that firms that are geographically remotely located, and as a result more sensitive to the principal-agent problem as monitoring is more difficult, tend to pay higher dividends.

The third explanation is that of asymmetric information. As shareholders do not have access to all the information in the firm, executives would use dividends as a signaling device to investors. Management

teams would not risk to use the firm's capital to pay dividends if they were not confident in the prospects of their firm. As such, an increase or decrease of the dividend would strongly signal the firm's future to investors. Miller and Rock (1985) create a model where managers have more information than outsiders on the prospects of their company and show that managers who anticipate better future profits increase shareholder distributions. Bessler and Nohel (2000) show that the announcement of dividend cuts by money-center banks in the US are used as a signal of the quality of their loan portfolios by investors. Finally, Drienko and Khorsand (2023) show that firms that do not change their dividend for several quarters in a row, so-called "dividend hibernators", experience higher unexpected future earnings growth for the following 5 years and are more opaque.

Other explanations have also been provided by researchers such as transaction costs, irrational behavior on the part of investors, the life cycle of the firm or the bird in hand theory. For instance, Grullon et al. (2002) use the age of firms to determine the level of their dividend payment. As firm become more mature and grow less or stop growing, they start paying more and more of their available free cash flow as dividend to shareholders.

Baker et al. (2007) survey CFOs of national and multinational firms listed on the Toronto Stock Exchange to investigate the determinants of dividends. They hypothesize that the industrial classification of a firm has an impact on its propensity to pay a dividend and on its level. They specifically focus on the difference between financial and non-financial firms. Two main factors cause this: an industry effect which would constrain the ability of each industry to pay a certain level of dividend and a herding behavior among firms in the same industry. They also hypothesize that a company being multinational has an effect on dividends and would be due to the growth opportunities and current and future profitability of these companies. Their results show that the most important determinants of dividends for survey CFOs are "stability of earnings", "the pattern of past dividends", "the level of current earnings", and "the level of expected future earnings". Financial firms put the most importance on the stability of earnings contrary to non-financial firms who put the most importance on the level of future expected earnings. Results also show that the payout ratio is significantly higher for firms in the financial industry at 33.8% compared to 20.2% for non-financial firms. Financial firms also put a high importance on paying dividends payout ratios in line with their peers, whilst this is less of a concern for non-financial firms. Baker and Powell's (1999) explanation of the bird in the hand theory, developed by Gordon and Lintner (1962), is the following: dividends are more certain than potential share price appreciation and thus, firms with high dividend payout ratios should be seen as less risky, reducing their cost of capital and leading investors to buy at a premium. Miller and Modigliani (1961) disagree, calling the theory a fallacy, as they claimed that only the cash flows generated by the firm's assets can alter its risk profile.



## 2.3 Existing Theory on Share Buybacks

Share buybacks are when a company acquires shares from existing shareholders which can either be cancelled or kept in the treasury for further issue depending on local rules and regulation. These buybacks are similar to dividends in the distribution of cash to shareholders as they are a way of distributing cash to existing shareholders. After 1980 the percentage of total earnings spent on repurchase programs in the US increased from 4.8% to 50.1% in 1998 and share repurchases as a percentage of total dividends increased from 13.1% in 1980 to 113.1% in 2000 (Grullon & Michaely, 2002). In addition, during the time period 1972 to 2000, they find that the proportion of companies that paid dividends decreased from 60% to 20%. This evidence indicated that share buybacks had become the dominant form of payback in the early 21<sup>st</sup> century.

In the US there are four main ways in which a company can buy back its shares: (i) open market purchases, (ii) issuer tender offers, (iii) privately negotiated repurchases, and (iv) structural programs including accelerated share repurchase programs (Skadden, Arps, Slate, Meagher & Flom LLP and Affiliates, 2020). Executing a share buyback program in the form of open market purchases is the most flexible method as this usually occurs over a long period of time as a large number of shares must be bought and do not impose any legal obligations on the company. A tender offer, on the other hand, carries out the share buyback in a short period of time as it signals to the market the price or range of prices (in a Dutch auction) that the company is willing to pay for the shares through the tender offer. In a negotiation process the company negotiates with one, or several large shareholders to buy back the company's shares from them which can be more cost effective but perhaps also more time consuming. Finally, an accelerated share repurchase program (ASR) is the process by which a company buys back large blocks of its shares by relying on an investment bank to facilitate the deal. This involves the company entering into a forward agreement with the bank where the bank borrows shares of the bank typically from institutional investors such as mutual funds, insurance companies or pension funds and subsequently funnels the shares back to the company carrying out the buyback program.

The reason why a company may execute a buyback program and may do this instead of paying dividends are split into 7 hypotheses.

The first hypothesis is the signaling hypothesis in which we theorize that due to information asymmetry between management and shareholders, manager can use dividends and buybacks as a signaling mechanism. Repurchases give signals about the undervaluation of shares as well as of the future prospects of the company. Vermaelen (1981) found that signaling is the most prominent and plausible explanation of abnormal returns after repurchase announcement, especially if this repurchase is carried out through a tender offer. Bartov (1991) finds that open market repurchase announcements are

positively correlated to earnings and negatively correlated to systemic risk. Stephens and Weisbach find that firms increase repurchases depending on the perceived undervaluation of their stock and hence repurchases are negatively correlated with prior performance of the stock. When analyzing the different modes of stock repurchases, Comment & Jarrell (1991) and Louis & White (2007) found that of the three main repurchase methods (not including private negotiation or ASR), fixed-price tender offers signaled the strongest undervaluation.

The second hypothesis (Jensen, 1986), as is also the case for dividends, states that it is a disciplining tool for management to restrict them with cash such that they only undertake positive NPV projects. Boudry, Kallberg & Liu (2013) finds that when controlling for other possible buyback rationales, poor investment opportunities are related to higher levels of share repurchases and that the level of cash is positively related to repurchases only for low-investment opportunity set firms. He also finds that there is a negative relationship between share repurchase announcement returns and investment opportunities.

The third hypothesis refers to the company's leverage profile in which some companies carry out a share buyback to get closer to the target Debt to Equity ratio if the current ratio is lower than the target one. This is an important aspect of the decision-making process as to whether or not to buy back shares as confirmed by Hovakimian et al. (2001). They found that the higher the difference between the actual and optimum leverage ratio, the greater the probability of repurchase. Share buybacks can thus help to reduce the overall cost of capital of the firm by debt side of the equation, thereby increasing the tax shield and thus increasing firm value.

A fourth hypothesis is that share repurchases can be used to neutralize the EPS diluting effect that stock option exercising can have on the firm. Kahle (2002) found that firms announce repurchases when managers have large stock options outstanding because a dividend declaration would decrease the value of the stock option. This evidence is supported by Skinner et al. (2003) which supports that repurchases are used to mitigate the dilutive effect of stock options on EPS.

Another hypothesis is that share repurchases can be used as a defensive response to a hostile takeover. Bagwell (1992) found that company's face an upward sloping supply curve under a Dutch auction (higher supply for higher price) which means that the takeover cost to the acquirer will be higher if the target firm distributes cash through a repurchase than through a dividend. Sinha (1991) analyses the takeover deterrence hypothesis under the lens of being entirely debt financed and finds that carrying out a debt-financed share repurchase not only increases the value of the firm but also makes it a less attractive firm due to the increased financial distress cost.

A further hypothesis may be that of corporate governance in which Chan (2007) find that the management of a company can exploit the information asymmetry between insiders and outsiders in such a way that they can gain the advantage of undervaluation of shares by timing the repurchase. It finds that evidence is consistent with managers possessing market timing abilities when announcing and executing buyback decisions.

A final hypothesis is the inherent relation between share repurchases and market liquidity as they operate hand in hand. Half of the executives surveyed in Brav et al (2005) said that liquidity was an important factor driving repurchase decisions. Brockman, Khurana, and Martin (2008) found that OMR (Open Market Repurchase) initiating companies have significantly more liquid stock than non-initiating companies in the pre-purchase period which suggests that stock liquidity drives repurchase decisions. However, the overall evidence for the relationship is inconclusive as the nature of the relationship differs by time period, jurisdictions, and type of company studied. Nonetheless it still remains a pertinent determinant of repurchase decisions.

In conclusion, share buybacks have emerged as a significant method of returning value to shareholders, rivalling traditional dividends. Companies utilize various mechanisms for repurchases, including open market repurchases (OMRs), tender offers, negotiated repurchases, and accelerated repurchase programs (ASRs), each chosen based on strategic financial and regulatory considerations. The rationale for choosing buybacks over dividends is multifaceted, encompassing signaling, excess cash flow, optimum capital structure, stock options, takeovers defense, timing advantages due to insider information.

## **2.4 Preference of Dividends compared to Share Buybacks**

Historical trends in companies' payout policies provoke discussion of whether dividends and share repurchases may be viewed as substitutes (Bagwell & Shoven, 1989). In this case, companies finance share buybacks with funds that can otherwise be used to increase dividend. This has become one of the most important discussions in discovering the preference between Dividends and Share Buybacks as they both essentially act as payout methods to existing shareholders. In addition, the main cause of this hypothesis is the taxable nature of income from dividend paid and share buyback in the hands of shareholders. The existing literature on the substitution hypothesis finds that using the Lintner (1956) dividend model to forecast a firms' expected dividend level exhibits a negative correlation with the amount of share repurchase (Grullon & Michaely, 2002). However, according to executives interviewed by Brav et al. (2005) most do not view them as one-to-one substitutes.

One way that we can analyze the two and their differences is by looking at the main features that distinguish the two: Firstly, the gain from share repurchase is taxed under either short term or long-term capital gain at the hands of the shareholder, whereas dividend paid by the company is taxed as a regular income in the hands of shareholders. (Grullon & Michaely, 2002) find that as capital gain tax is much lower than the dividend, share repurchase is more tax efficient and valuable to shareholders. Secondly, the importance of timing and flexibility is another main difference where, unlike dividends, share repurchase does not promise cash flow in a regular interval (Dittmar, 2000). Another way to find the differences between share repurchases and dividend payouts is to analyze the features of companies that use the two payout methods. To develop on this idea of substitution, Jagannathan, Stephens and Weisbach (2000) analyzed the determinants of the two payout methods and found that dividends are paid from cash flows that are likely to be permanent whereas share repurchases are largely paid from temporary cash flows.

Now that we have discussed the main differences between the two, we can look at the various reasons as to why a manager may choose to pay out dividends instead of carrying out a share buyback and vice versa. This will act as a summary of the aforementioned literature as well as some that specifically analyses preferences between dividends and share buybacks.

Dividends are favored for their stability and predictability, which appeal to investors desiring consistent returns, such as retirees. This regular payout is often perceived as a reflection of the company's ongoing financial health, reinforcing investor confidence. Moreover, a consistent dividend payout or an increasing dividend trend can serve as a signal to the market of robust and reliable cash flows (Fama & French, 2001). Companies with a shareholder base that favors regular income might therefore opt for dividends to meet these investment preferences, and to attract like-minded investors. Additionally, in some tax jurisdictions, dividends might receive favorable tax treatment compared to capital gains, further enhancing their appeal to certain investor demographics (Grullon & Michaely, 2002).

Conversely, share buybacks offer managerial flexibility, allowing companies to adjust the timing and size of buybacks based on available cash and stock price considerations. This method is particularly beneficial in jurisdictions where capital gains taxes are lower than income taxes, rendering buybacks a more tax-efficient method of returning value to shareholders (Grullon & Michaely, 2002). Buybacks also enhance earnings per share (EPS) by reducing the number of shares outstanding, making the company more profitable on a per-share basis. This can be particularly attractive if the reduction in shares significantly impacts the EPS calculation (Stephens & Weisbach, 1998). Furthermore, managers might initiate buybacks when they believe the company's stock is undervalued, signaling to the market a confident investment in the company's own stock. This can lead to a positive reassessment of the stock by the market (Vermaelen, 1981).

In summary, dividends and share buybacks serve distinct strategic and financial roles in payouts to existing shareholders. Despite the tax efficiencies associated with share buybacks, many companies continue to use both methods concurrently, reflecting a blend of strategic objectives, from managing market perceptions to addressing internal cash flow stability. As the research suggests, the decision between distributing dividends or repurchasing shares is influenced by a wide range of factors, including tax considerations, regulatory environments, and underlying market conditions. This section of our paper has highlighted the main differences between these methods, alongside exploring the conditions under which each is preferred, drawing from both historical data and contemporary insights into corporate behavior and fiscal strategies.

## **2.5 Inflation Reduction Act (IRA) Taxation of Buybacks and Dividends**

The taxation of dividends and share buybacks has received increased attention in the past years as both have increased significantly since 2018 when the Trump administration passed the Tax Cuts and Jobs Act (TCJA) which lowered overall taxes on corporations. Politicians on both side of the political spectrum have voiced their opposition to the growing amounts being spent on share buybacks and dividends. Democrats' opposition to buybacks is not recent but in the past few years several arguments against them have been used. This includes stock-market manipulation from executives to inflate the value of their stock options, responsibility for wage stagnation of workers, sluggish growth or corporate underinvestment (The Atlantic, 2023). At the height of the pandemic, Donald Trump supported a ban on share buybacks for firms receiving federal help (Reuters, 2020) and expressed his disappointment with firms that used the extra cash generated by the TCJA for buybacks (CNBC Television, 2022)

As the United States started to recover from the economic and social impact of the Covid-19 pandemic, the Senate and the House of Representatives passed the Inflation Reduction Act (IRA) which was signed into law on August 16<sup>th</sup>, 2022. As part of the law, a 1% excise tax on stock buyback has been imposed and took effect on January 1<sup>st</sup>, 2023 (Deloitte., 2023). The new share buyback excise tax (SBET) has many conditions governing in which situation the tax can be triggered.

The tax is paid on the fair market value of the stock of a publicly traded U.S. Corporation or a specified affiliate (owns >50% equity interest) that they repurchase during a taxable year, if the total amount repurchased exceeds \$1 million. If the corporation issues new shares during the same year, the issuances are netted against the repurchases and only applies to the excess of value repurchased against issued. A few other conditions exist, for example if the repurchase is part of a reorganization that does not give rise to gains or losses on behalf of shareholders, if the repurchases are treated as dividends for U.S. tax

purposes, or if the repurchased shares are contributed to an employer-sponsored retirement plan, then, under these conditions, the SBET does not apply. Furthermore, if the repurchase is made as part of a company's normal course of business such as for a regulated investment company or REIT, then the SBET also does not apply (Houlihan Lokey, 2022).

There are various additional traps to be aware of, in particular, for M&A transactions and the corresponding shareholding structure effects ensuing these transactions. However, due to the scope of this thesis, we have decided to deem them as too complex to incorporate into our analysis and hence will treat companies falling under this criterion as having repurchases taxable under the SBET.

The tax is supposed to reinvigorate investment of profits into workers, growth and innovation to maintain the growth of the US Economy and reduce the US budget deficit (Latham & Watkins, 2022). Since the inception of this regulation, President Biden has proposed raising the current excise tax from 1 percent to 4 percent for stock repurchases. According to a Wharton "Budget Model" article, this could eliminate approximately 85% of the tax preference for share repurchases over dividends (Penn Wharton Budget Model, 2022).

## **2.6 Hypotheses**

We believe that the share buyback tax could have the following effects which we will test in our two hypotheses:

1. The tax will reduce overall shareholder payout
2. Reduced shareholder payouts will have the desired effect of increasing company investment in productive business activities.
3. Stock repurchases become less desirable compared to dividend payouts, hence companies will shift back to paying higher or new dividends to shareholders.

### 3. Data

The main source of data of this paper is the Wharton Research Data Services (WRDS) platform, a database of the Wharton School of the University of Pennsylvania. More specifically, we used data from the Center for Research in Security Prices (CRSP) and S&P Compustat Capital IQ Merged database. Our dataset contains 9136 observations for 16 quarters between the first quarter of 2020 and the fourth quarter of 2023.

#### 3.1 Variables

The following variables are present in our dataset. *Dividend per share*<sub>*i,t*</sub>, defined as the dividend amount per common share in US dollars paid by each company *i* at time *t*, with  $t \in [Q1\ 2020, Q4\ 2023]$ ; *Outstanding shares*<sub>*i,t*</sub>, defined as the number of outstanding common shares of each company *i* at time *t*; *Preferred Dividend*<sub>*i,t*</sub> defined as the amount of preferred dividend in US dollars paid out by company *i* at time *t* which occurs only if the company has preferred shares and pays a dividend on them; *Quarterly Dividend*<sub>*i,t*</sub>, defined as the total amount of dividend payed out by company *i* at time *t* and calculated in the following way:  $Dividend\ per\ share_{i,t} * Outstanding\ shares_{i,t} + Preferred\ Dividend_{i,t}$ . Finally, *Dividend*<sub>*i,t*</sub> defined as the dividend paid by a company over a calendar year is calculated by summing the *Quarterly Dividend* of the four quarters of that year. *Shares repurchased*<sub>*i,t*</sub>, defined as the total amount of shares repurchased by company *i* during quarter *t*; *Repurchase price*<sub>*i,t*</sub>, defined as the average share repurchase price in US dollars of company *i* during quarter *t*; *Quarterly Buyback*<sub>*i,t*</sub>, defined as the buyback amount in US dollars paid by company *i* at time *t* and calculated in the following way:  $Shares\ repurchased_{i,t} * Repurchase\ price_{i,t}$ ; Similarly to the dividend, *Buyback*<sub>*i,t*</sub> defined as the buyback amount made by a company over a calendar year is calculated by summing the *Quarterly Buyback*<sub>*i,t*</sub> of the four quarters of that year. *Payout*<sub>*i,t*</sub>, defined as the total return to shareholders company *i* has executed during quarter *t* in US dollars and calculated as the sum of *Dividend*<sub>*i,t*</sub> and *Buyback*<sub>*i,t*</sub>; *Quarterly Capex*<sub>*i,t*</sub>, defined as the amount of capital expenditure in US dollars spent by each company *i* at time *t*. Finally, *Capex*<sub>*i,t*</sub>, total amount of capital expenditure of a company in a calendar year is calculated by summing the four *Quarterly Capex* of the relevant year.

Additionally, we use two dummy variables: *Treat*<sub>*i*</sub> which indicates whether company *i* is treated by the experiment at time *t* and *Post*<sub>*i*</sub> which indicates whether company *i*'s dividend payment occurs after the implementation of the experiment, the tax.

Finally, we use a variable for company fixed effects, *Global Company Key* which is a unique key for each company in our dataset and a variable for time fixed effects, *Year* which is the calendar year of the observations.

### **3.2 Data Cleaning**

Companies that were classified as financial institutions such as banks, insurers, investment trusts and real estate investment trusts (REITs) were taken out of our dataset as these companies often are more heavily regulated than non-financial institutions. The institutions regulating them, central banks and dedicated banking regulators, can force them to limit their payouts based on the macroeconomic environment, world financial stability, or the operations of the institution, an element that strongly affects the variables we are using in our analysis. Also, data on capital expenditure as defined in this paper is difficult to obtain as banks, insurance companies, investment trusts and REITs' cash flow statement do not exhibit the same elements as non-financial institutions.

Additionally, a substantial part of companies present in the STOXX Europe 600, which represents our control group in this experiment, didn't exhibit any dividend and buyback amounts, which was inaccurate and thus, were taken out of our dataset. As a result, the total number of companies used for the treatment group is 346 out of the 500 companies member of the S&P 500 and the total number of companies used for the control group is 225 out of the 600 companies member of the Stoxx 600, as can be seen in table 2.

### **3.3 Data Analysis**

It is interesting to observe that the average company in our sample is large, with average payouts of around US \$2.6bn per year across the 4 years analyzed. Also, we can see that, on average, companies allocate roughly equivalent amounts to dividends (46%) and buybacks (54%) over the period. Finally, the average company in our sample allocates around US \$2bn to capital expenditures.



**Table 1 Descriptive statistics**

Variable	Mean	Standard deviation	Min	Max	Skewness	Kurtosis	Observations
Dividend	892.09	1875.96	0	15357	3.77	20.19	2284
Buyback	745.01	2870.23	0	62184	12.52	222.58	2284
Payout	1637.10	3783.24	0	62184	6.78	77.96	2284
Capex	1733.44	3949.40	0	63645	6.85	76.40	2284
Total Assets	49466.03	81628.34	1040	1069978	4.81	38.82	2284

This table showcases the descriptive statistics of the main variables of this paper. The columns show the variable name, mean, standard deviation, minimum, maximum, skewness, kurtosis and number of observations. All variables are given in millions of US dollars and correspond to yearly values.

**Table 2 Companies included in dataset by index**

Index	Observations
S&P 500	346
Stoxx 600	225
Total number of companies	571

We have also conducted a Mann–Whitney test to understand whether firms in our control group, which are the firms present in the Stoxx 600, are similar in size, measured by total assets, to the treated groups, which are the firms present in the S&P 500. Results of this test can be observed in table 3 and indicate that the two groups are significantly different from each other as measured by total assets.

**Table 3 Mann-Whitney test**

Region	Observations	Rank Sum
US	1038	920181.5
Europe	675	547859.5
Total	1713	
Z-Score	3.060	
P-value	0.002	

## 4. Method

This paper uses ordinary least square (OLS) regressions with robust standard errors to study the impact of the IRA on payouts, capital expenditures and the mix of dividends and buyback in overall shareholder payouts. Robust standard errors are used as Breusch-Pagan tests were carried out and indicated heteroskedasticity in all cases. We carry out a data collection around the time of the event, where the tax applies as of January 1, 2023. We define the period before the event as the time frame 2019 to 2022, and the period post-tax as the data of 2023.

To answer hypothesis 1, we conduct one regression. The first regression seeks to assess whether the tax led to reduced shareholder payouts:

$$Payout_{i,t} = \alpha + \beta_1 * Treat_i + \beta_2 * Post_i + \beta_3 * Time\ Fixed\ Effects + \beta_4 * Firm\ Fixed\ Effects + \ln(Total\ Assets) + \epsilon_{it}$$

The second regression seeks to assess whether the law had the desired effect of increasing company investment in productive business activities and thus, answer hypothesis 2:

$$Capex_{i,t} = \alpha + \beta_1 * Treat_i + \beta_2 * Post_i + \beta_3 * Time\ Fixed\ Effects + \beta_4 * Firm\ Fixed\ Effects + \ln(Total\ Assets) + \epsilon_{it}$$

Two regressions are also used to answer hypothesis 3, which seeks to understand whether share buybacks became less desirable because of the tax:

$$Dividend_{i,t} = \alpha + \beta_1 * Treat_i + \beta_2 * Post_i + \beta_3 * Time\ Fixed\ Effects + \beta_4 * Firm\ Fixed\ Effects + \ln(Total\ Assets) + \epsilon_{it}$$

And

$$Buyback_{i,t} = \alpha + \beta_1 * Treat_i + \beta_2 * Post_i + \beta_3 * Time\ Fixed\ Effects + \beta_4 * Firm\ Fixed\ Effects + \ln(Total\ Assets) + \epsilon_{it}$$

## 5. Results

This section describes the results of the two questions asked by this paper: does a tax on stock buybacks lead to lower payouts and a reallocation of funds to capital expenditures and does it lead to a change in the types of buybacks conducted by companies?

### 5.1 Payouts and Capital Expenditures

The results of the first OLS regression which regresses *Payout* on *Treat*, *Post* and the interaction effect can be observed in table 4. The coefficient of *Treat* indicates the difference in payouts between firms that were treated by the tax change and those that were not before the tax change. The coefficient is significantly different than 0 as it is significant at the 1% level in all three specifications of the model. The coefficient of *Post* indicates the difference in payouts before and after the tax change for firms

which were not affected by the tax change. It is not significantly different than 0. These two coefficients are not of interest to answer our first hypothesis.

The coefficient of the interaction effect between *Treat* and *Post* is of interest as it indicates the effect of the tax change on treated firms. It is not significantly different than 0 in the first and third specification and thus, shows that with the use of this dataset, the tax change had no impact on overall payouts by firms. However, the second specification of the model shows a significant negative coefficient for the interaction effect at the 1% level. It indicates that treated firms paid out less to shareholders post-tax change compared to the expected payout by our model. More specifically, the tax change led to a 28.3% reduction in payouts, based on our model.

As a result, the first hypothesis is not rejected.

**Table 4 Payouts regressions**

	(1) Payout	(2) ln(1+Payout)	(3) Payout/Total Assets
Treat	-1639.423*** (575.598)	-6.134*** (1.465)	-0.010*** (0.004)
Post	66.642 (120.102)	0.292 (0.381)	0.001 (0.002)
Treat*Post	-161.800 (144.606)	-0.333*** (0.114)	-0.003 (0.002)
Constant	-5440.962* (2995.325)	0.202 (2.571)	0.004** (0.002)
Observations	2284	2284	2284
R <sup>2</sup>	0.880	0.900	0.880
Adjusted R <sup>2</sup>	0.839	0.866	0.839

The table provides the results of the first OLS regressions where the dependent variable is Payout, ln (1+Payout) and Payout/Total Assets and the independent variables are Treat and Post. Firm fixed and time fixed effects time are applied, and ln (1+Total Assets) is used as control variable for the first two regressions. The number of observations, R<sup>2</sup> and Adjusted R<sup>2</sup> can be read at the bottom of the table.

Standard errors are in brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

The results of the second OLS regression which regresses *Capex* on *Treat*, *Post* and the interaction effect can be observed in table 5. The coefficient of *Treat* indicates the difference in capital expenditures between firms that were treated by the tax change and those that were not before the tax change. The coefficient is significantly different than 0 as it is significant at the 1% level in the second and third specifications but is not significantly different than 0 in the first specification. The coefficient of *Post* indicates the difference in capital expenditures before and after the tax change for firms which were not affected by the tax change. It is also significantly different than 0 as it is significant at the 1% level in all three specifications. Similarly to the first regression, these two coefficients are not of interest to answer our first hypothesis.

The coefficient of the interaction effect between *Treat* and *Post* is of interest as it indicates the effect of the tax change on treated firms. It is not significantly different than 0 in any of the specifications and thus, shows that with the use of this dataset, the tax change had no impact on capital expenditures of firms. This indicates that even if firms have reduced their payouts as concluded in the first section of results, they have not decided to reinvest this capital in capital expenditures.

As a result, the second hypothesis can be rejected.

**Table 5 Capex regressions**

	(1) Capex	(2) ln(1+Capex)	(3) Capex/Total Assets
Treat	753.521 (596.992)	3.186*** (0.565)	0.033*** (0.009)
Post	257.948*** (76.278)	-0.199*** (0.076)	0.004*** (0.001)
Treat*Post	26.354 (85.577)	0.019 (0.047)	0.001 (0.001)
Constant	-6714.610*** (1733.151)	0.039 (0.827)	-0.004* (0.002)
Observations	2284	2284	2284
R <sup>2</sup>	0.966	0.964	0.966
Adjusted R <sup>2</sup>	0.955	0.952	0.955

The table provides the results of the second OLS regressions where the dependent variable is Capex, ln (1+Capex) and Capex/Total Assets and the independent variables are Treat and Post. Firm fixed and time fixed effects time are applied, and ln (1+Total Assets) is used as control variable for the first two regressions. The number of observations, R<sup>2</sup> and Adjusted R<sup>2</sup> can be read at the bottom of the table.

Standard errors are in brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

## 5.2 Dividends and Buybacks

The results of the third OLS regression which regresses *Dividend* on *Treat*, *Post* and the interaction effect can be observed in table 6. The coefficient of *Treat* indicates the difference in dividends between firms that were treated by the tax change and those that were not before the tax change. The coefficient is significantly different than 0 as it is significant at the 1% level in all three specifications. The coefficient of *Post* indicates the difference in dividends before and after the tax change for firms which were not affected by the tax change. It is significantly different than 0 as it is significant at the 1% level and 5% in the first and third specifications. It is not significant in the second specification. These two coefficients are not of interest to answer our second hypothesis.

The coefficient of the interaction effect between *Treat* and *Post* is of interest as it indicates the effect of the tax change on treated firms. It is significantly different than 0 in all three specifications and thus, shows that with the use of this dataset and model, the tax change had a negative impact on dividends of

firms. More specifically, the second specification shows that the change in taxation led to a 28.5% decrease in dividend payments.

**Table 6 Dividend regressions**

	(1) Dividend	(2) ln(1+Dividend)	(3) Dividend/Total Assets
Treat	-1283.094*** (195.915)	-6.658*** (1.092)	-0.011*** (0.002)
Post	159.823*** (58.894)	0.362 (0.316)	0.003** (0.001)
Treat*Post	-136.910** (59.430)	-0.336*** (0.114)	-0.002** (0.001)
Constant	-2919.551*** (937.086)	-0.572 (2.423)	0.010*** (0.002)
Observations	2284	2284	2284
R <sup>2</sup>	0.955	0.917	0.955
Adjusted R <sup>2</sup>	0.940	0.889	0.940

The table provides the results of the first OLS regressions where the dependent variable is Dividend, ln (1+Dividend) and Dividend/Total Assets and the independent variables are Treat and Post. Firm fixed and time fixed effects time are applied, and ln (1+Total Assets) is used as control variable for the first two regressions. The number of observations, R<sup>2</sup> and Adjusted R<sup>2</sup> can be read at the bottom of the table.

Standard errors are in brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

The results of the fourth OLS regression which regresses *Buyback* on *Treat*, *Post* and the interaction effect can be observed in table 7. The coefficient of *Treat* indicates the difference in buybacks between firms that were treated by the tax change and those that were not before the tax change. The coefficient is not significantly different than 0. The coefficient of *Post* indicates the difference in buybacks before and after the tax change for firms which were not affected by the tax change. It is also not significantly different than 0. These two coefficients are not of interest to answer our second hypothesis.

The coefficient of the interaction effect between *Treat* and *Post* is of interest as it indicates the effect of the tax change on treated firms. It is not significantly different than 0 in the first and third specifications and thus, shows that with the use of this dataset, the tax change had no impact on buybacks of firms. However, the second specification tends to indicate that the increased taxation led to a decrease of buybacks by 28.5%, in line with the result of the dividend model.

The results of these two regressions indicate that the third hypothesis we have formulated can be rejected as a shift from buybacks to dividend payments has not occurred in the mix of shareholder payouts.

**Table 7 Buyback regressions**

	(1) Buyback	(2) ln(1+Buyback)	(3) Buyback/Total Assets
Treat	-356.329 (544.447)	1.534 (1.520)	0.001 (0.003)
Post	-93.181 (95.580)	-0.682 (0.505)	-0.002 (0.002)
Treat*Post	-24.890 (126.285)	-0.336* (0.178)	-0.000 (0.002)
Constant	-2521.411 (2830.411)	0.650 (3.373)	-0.005** (0.002)
Observations	2284	2284	2284
$R^2$	0.823	0.782	0.823
Adjusted $R^2$	0.763	0.708	0.763

The table provides the results of the first OLS regressions where the dependent variable is Buyback, ln (1+Buyback) and Buyback/Total Assets and the independent variables are Treat and Post. Firm fixed and time fixed effects time are applied, and ln (1+Total Assets) is used as control variable for the first two regressions. The number of observations,  $R^2$  and Adjusted  $R^2$  can be read at the bottom of the table.

Standard errors are in brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

These results are interesting as they do not indicate a strong link between the level of taxation of buybacks and companies' decisions on the level of buybacks offered to shareholders as well as the mix offered, at least for a tax of 1%. This goes against the argument of tax being a determinant of payouts and firms deciding to pay in one form or another to attract a certain shareholder base (the so-called "cliente" effect). This also goes against research conducted by Jeong (2013) and Grullon & Michaely (2002). However, this is in line with the assertion that companies do not make payouts decision only based on taxation levels but on a host of strategic issues, as outlined by Brav et al. (2005).

## 6. Limitations and Considerations

A primary constraint relates to the composition and size of the dataset. Our analysis was restricted to companies within the S&P 500 and the STOXX 600 indexes, excluding financial institutions due to the intense regulation of the industry. First of all, the exclusion of smaller firms or those outside the major indexes may have overlooked variations in dividend, buyback, and Capex behaviors that could inform broader market dynamics. Furthermore, the distinct lack of data points compared to the overall sample of STOXX 600 companies that we could find using advanced data tools such as WRDS (Wharton Research Data Services), Bloomberg, Refinitiv and other platforms may have reduced the accuracy of our regression analysis as well as reduced the statistical power of our results. It may also have limited the generalizability of our findings as not having all 600 data points is not representative of the entire index and therefore the results may be biased and may be influenced by specific characteristics of those companies for which we have data points rather than reflecting broader market trends.

A second limitation that we have found with our study is the very recent implementation date of the IRA, with its tax changes only effective from January 2023. This presents a limitation in terms of available data, with only one year of post-tax data which makes it challenging to discern long-term trends and effects. Regulatory changes that are formed with the intention to influence corporate behavior, such as changes in taxes as seen by the IRA, may require several years to become evident as many companies plan their future expenditure in advance, or, as we know with the Lintner model, effects are smoothed over time. Consequently, our thesis' ability to capture the full impact of the IRA on corporate payout policies is limited to the effects visible one year post implementation of the policy.

Our thesis also does not account for the full spectrum of global tax policies and economic conditions that influence dividend and buyback decisions. Different jurisdictions have varying tax implications for dividends and buybacks which can affect corporate behavior. For example, in Brazil, Brazilian law requires that companies distribute at least 25% of their adjusted income in the form of dividends (Forti, Piexoto, & Alves, 2015) In addition, the tax benefits that drive buyback decisions in the U.S. may not be present in other countries, leading to different payout strategies. The study's focus on predominantly U.S. and European companies may therefore not fully represent global corporate financial strategies.

An important limitation that we have found to likely add a lot of noise to our data points is the timeframe of the data, which coincides with significant economic upheavals, including the COVID-19 pandemic and subsequent periods of economic uncertainty, which are characterized by unusual market volatility and economic stimuli. These conditions can skew typical corporate financial behaviors, potentially confounding the effects attributed to the IRA. It is difficult to isolate the impact of the tax changes from the broader economic recovery dynamics and to adjust for these factors would have not been within the

scope of the Master's thesis, however should be something that should be further analyzed should the topic be researched again.

Furthermore, in our conducting of the Mann–Whitney, we found that the two sets of companies that we looked at (European and US stocks) are significantly different from one another. This presents a limitation in our results as it was difficult to find comparable stocks to US stocks that were not treated by the IRA taxes, therefore we had to look internationally at companies that don't have their share repurchases taxed. Therefore, we believed that European stocks would be the best alternative to look at. However, it seems that perhaps because of their difference in characteristics, it may describe some of the slightly more puzzling results that we found. Therefore, should we pursue this study again, it may have been better to look at within-company effects pre and post tax implementation.

Finally, shifts in accounting standards and disclosure practices over the analysis period could impact the comparability of data year-over-year. Despite using the same data points from WRDS through CRSP and CRSP-Compustat merged databases, differences in accounting principles will likely have caused certain small discrepancies in ways that data points are calculated, in particular between European and US stocks. Furthermore, changes in how companies report buybacks, dividends, or even financial health metrics like earnings and cash flow can alter the interpretation of payout behaviors. Therefore, this thesis assumes consistency in reporting practices, which may not hold true across all firms and time periods and would warrant further exploration should the topic be researched again.



## 7. Conclusion

This paper has studied the effect of the change in taxation of shares buybacks caused by the IRA passed by Biden administration and which took effect in 2023. We hypothesized that this change in taxation would lead to a decrease in payouts of companies to their shareholders and a redeployment of that available cash to capital expenditures on the one hand and a shift from buybacks to dividends as a preferred payout method.

We used four OLS regressions to answer our three hypotheses with data spanning 2020 to 2023 from CRSP-Compustat. Our results led us to find that as hoped, overall shareholder payouts have decreased, as evidenced in table 4, which therefore confirms our first hypothesis. However, regarding the following hypothesis, we found the effect on capital expenditures to be inconclusive, leading us to reject the second hypothesis. Finally, looking at the third hypothesis we found that rather than dividends becoming a preferred form of shareholder payout, we found that both dividends and buybacks had a statistically significant decrease, therefore we also had to reject our third hypothesis.

These results have several implications for researchers and policymakers. For researchers, takeaways include that the effect of taxation on shareholder payout decisions by large corporates across the US and Europe is limited, especially when the level of taxation is low. Furthermore, as the taxation level is anticipated to be increased by the US administration to 4% in the years to come, it would be interesting to continue this research and see if higher levels of taxation have a more pronounced effect on shareholder payout mechanism choices. In addition, we would propose conducting a survey directed towards CFOs in order to understand whether the tax has been incorporated into firm decision making, as we believe that not all executives may be aware of the tax change or may have had the flexibility to alter their payout composition in such a short period of time. For policymakers, given our non-conclusive results, we would suggest carrying out a more aggressive taxation level if the desired goal is to reduce capital allocated to shareholders instead of profitable investment projects.

Overall, we believe that this topic warrants further research over a longer period of time as this could be a fundamental topic to address as our research adds another question to the dividend puzzle.

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