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Stock Market Drivers: Corporate Share Repurchases

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ABSTRACT

Such financial tools as share buybacks are coming under scrutiny by many investment experts. Evidence suggests that share repurchases foster a short-term focus in corporate managers who have a share-based compensation. Recent studies and research draw attention to the negative consequences of corporate share repurchases. While share buybacks were originally intended to create financial value for intrinsically undervalued shares, they are increasingly coming under scrutiny for enabling shareholders to increase their value of wealth at the expense of other stakeholders. With increased stock option plans for corporate executives, the association between increase in open market share buyback activity and compensation may not be a coincidence. Research shows, however, that open market share repurchases have resulted in high stock prices in recent years that run contrary to negative fund flows. At the same time, fundamental corporate growth strategies and fixed investments have not seen a significant rise in activity. This paper measures the impact of corporate share repurchase activity on stock market returns by analyzing broader market measures and industry returns.

I. INTRODUCTION

The U.S. stock market experienced the longest bull market on record in the years that followed the financial crisis in 2008-2009. Expansions are marked by such fundamental indicators as economic growth, low unemployment and stable inflation. Expectations of strong future profitability implied by these fundamentals attract investors and, as a consequence equity fund flows should increase. With the introduction of exchange-traded fund (ETF) products, however, implementation of share repurchases and corporate consolidation through mergers and acquisitions, this expansion is different from what may be considered “natural” expansion.

Corporate share buyback activity has become progressively important for major U.S. corporations to build shareholder wealth over the last decade (Stevens, 2019). The $3.8 trillion worth of company stock repurchased in the previous nine years—ended 2018—exceeds the cumulative investments from all other sources – (individuals, mutual funds, pension funds, and foreign investors - combined). Although the volume of buybacks has exceeded cumulative investments from all other sources, some scholars deem share repurchases as an ineffective tool. Useem (2019) finds that stocks of companies engaged in high volume buybacks have performed worse over the subsequent five years for shareholders than companies not engaged in the

activity. The debate around the merits and shortcomings of corporate share buybacks and their impact on stock market returns has escalated in recent months in the midst of the COVID-19 pandemic and the consequences arising from the buyback activity for the last decade.

The recent COVID-19 pandemic has seen stay-at-home orders, suspension of major events (for instance. 2020 Summer Olympics), and business shut downs that are slowing the current expansion. This global public health crisis has exposed the negative implications of aggressive buyback activity by *some* major corporations. *Some* major U.S. companies have launched billion-dollar buyback programs in recent years, which has been a primary driver of U.S. stock market performance. But in the wake of the COVID-19 outbreak, the slowdown in revenues and calls for government support may – "severely curtail"— repurchase activity (Winck, 2020). As a result, market participants should expect wider trading ranges, less downside support and slower earnings per share (EPS) growth (Constable, 2020).

More than likely, companies requesting government support could be required to stop dividend and buyback programs as a consequence. Lastly, the market conditions following the contraction of economic activity has the potential to be different to previous financial crises. With share buybacks curtailed and cash flows slowing down, the subsequent rise in market volatility and government restrictions may impact stock market returns.

Corporate operating performance and mutual fund flows are traditionally primary drivers of stock performance, but in recent years' corporate share buyback activity has become increasingly prominent and influential in determining stock returns. As a result, this analysis quantifies the influence of corporate share repurchases on broader market indexes and industry stock returns.

Section II presents background information on share buybacks. Evidence from scholars is presented in Section III. The empirical model is presented in Section IV. This Section is segmented into Theoretical Model, Data, Model Results and Limitations. The conclusion is presented in Section V.

II. BACKGROUND

Before discussing the effects of corporate share buybacks, this section explores their original intent. Prior to 1982, regulators considered share buybacks as market manipulation and

were deemed illegal (Denning, 2018). Reducing the number of shares improves EPS measurements. If the company's reported EPS beats Wall Street estimates, this could provide an artificial value for outside investors and coverage analysts. If analyst covering the company see profitability improvement, they may enhance the stock price's future outlook. In theory, outside investors may be more willing to purchase shares of the company after reading analyst's coverage.

Lazonick (2014) states that with the passage of Rule 10b-18 of the Securities Exchange Act in 1982, "a corporation's board of directors can authorize senior executives to repurchase up to a certain dollar amount of stock over a specified or open-ended period of time, and the company must publicly announce the buyback program." According to Alsin (2017), the original intention of share repurchases are for companies that "truly have an undervalued stock, and using excess cash to repurchase shares is actually a prudent, if not potent use of that shareholder cash." The application, however, has evolved for a variety of other purposes since the passage of the rule.

Since 1982 share buyback activity by corporations has proliferated. Companies have the option to buy shares directly from the marketplace or offer shareholders the option to tender shares directly to the company (Banton, 2019). Managers of public corporations who generate profit can retain these earnings for capital investments or they can distribute them to shareholders in the form of dividends or share buybacks.

Corporate managers are motivated by a number of options in their choice. For share buybacks in particular, "the net impact of a share repurchase is to reduce the number of outstanding shares, which boosts the must-watched earnings-per-share metric even if overall net income remains flat" (The Motley Fool, 2016). Although, companies may not actually be growing profits, the EPS measurement for those companies that engage in share buybacks may imply otherwise. For instance, Applied Materials had a 3.5 percent revenue decline in 2018, yet the company managed to grow their earnings per share by 1.9 percent. (Useem, 2019)

The specificity of an "undervalued stock" is key when buybacks are measured in terms of effectiveness. There is a degree of subjectivity in determining the intrinsic value of a stock and, depending on a stock analysis and interpretation, the decision to repurchase shares can also be regarded as subjective. Share buybacks incentivize short-term EPS growth for managers, while also strengthening the company's financial valuation for outside investors. The pressure on short-term growth for company executives comes to the "expense of innovation, long-term shareholder value, and the dynamism of the entire economy." (Denning, 2018). Financial tools can interfere with capital re-investment on such tangible products as research and development.

Share buybacks interfere with conventional fixed investments and impede on corporate growth leading to negative consequences in the economy.

With the legalization of corporate share repurchases, corporate executives have the incentive to address shareholder needs by increasing share repurchasing activity. Stewart (2018) finds that since the 1982 legislation, corporations have announced more than $9.9 trillion in share buybacks in the past four decades and the volume of share buybacks has increased notably in recent years. He further shows that since 2008, $5.6 trillion in share buybacks were announced by public corporations. More than 50 percent of legalized share buybacks were announced in the past decade alone. Corporate managers have been relying on share repurchases "rather than creating fresh value and new customers through entrepreneurship and innovation"; they have been "extracting value for shareholders (and themselves) by buying back their own shares." (Denning, 2018) This activity illustrates the impact of executive decisions at major companies in the United States.

The Securities and Exchange Commission (SEC) has reported that these executives are abusing their managerial power to create their own wealth. According to an SEC analysis (2003), in the eight days following a buyback announcement, corporate executives within the company sold, on average, five times as much stock as they did on an ordinary day. While the ruling in 1982 may have changed the shareholder-manager relationship for the better, the misuse of the buybacks highlights why share repurchases were first deemed illegal. Amended legislation continues to show the unintentional consequences associated with share buybacks.

In 2003, the SEC amended the original Rule 10B-18. It simplified repurchases, requiring that four conditions be met for share buybacks to be deemed legal, and introduced transparency with issuer repurchases by requiring disclosure details on 10-Q, 10-K and 20-F (Securities and Exchange Commission, 2003). The four conditions are: repurchase manner, repurchase timing, prices paid and volume of shares.

President George W. Bush added a one-time tax program to the American Jobs Creation Act of 2004, where corporations had the option to "repatriate" funds from overseas to the U.S. at a reduced rate of 5.25 percent. These funds would "shovel that money back into the economy in the form of investment and job creation" (Cox, 2017).

While the intention of the program was to grow capital re-investment through corporations and provide all stakeholders with value growth, there were unintentional

consequences. The results did not go as planned. Jilani (2017) cites a 2011 Senate study of 840 participating companies, the program brought $312 billion to the U.S. while the top 15 participating companies "reduced their total U.S. employment by 20,931 jobs … no evidence existed that repatriated funds increased overall U.S. employment". At the same time, the top five executives' compensation increased 27 percent from 2004 to 2005, while the "top 15 repatriating corporations increased their spending on stock buybacks 16% from 2004 to 2005 and 38% from 2005 to 2006." The sharp increase in stock buybacks put the repatriation program into question. As jobs were being lost, executives were spending the repatriated cash on increased executive compensation and share buybacks. Company executives have the ultimate power in deciding how to spend the extra cash generated through profit. Since 2004, executives have demonstrated that share buybacks are the most effective use of that cash. Between 2004 and 2013, 454 companies in the S&P 500 Index repurchased $3.4 trillion in stocks, "represent(ing) 51 percent of net income."

Large corporations have been increasingly engaging in share buybacks in recent years as corporate tax cut policies have provided incentives to do so. This latest wave started in 2013 and we can examine the growth in buybacks in the years since. Buybacks-to-free cash flow is a financial metric that represents the percentage of free cash flow spent on share repurchases. In 2017, buybacks-to-free cash flow were 82 percent. Two years later in 2019, buybacks-to-free cash flow was 104 percent. A double-digit percentage point increase in just two years is significant growth in such a short time. Moreover, it was the first time that buybacks-to-free cash flow had reached over 100 percent since 2009 (Cox, 2019). This indicates the speed at which corporate managers are choosing to spend free cash on buybacks opposed to fixed, capital investments.

The recent 2017 Tax Cuts and Jobs Act created a gap of wealth for American corporations to distribute. After receiving a 14-point corporate tax rate deduction, executives were advised to make fixed investment strategies and drive growth through new capital investment projects benefitting all stakeholders. This corporate tax cut was intended to help employees. Yet, a Bloomberg analysis cited by Stewart (2018) concluded that 60 percent of the tax cut's benefits will go to shareholders, whereas 15 percent will go to employees. Moreover, a Morgan Stanley study also predicted that 43 percent of the tax cut gains were expected to go to stock buybacks and dividends, while 13 percent would be distributed to employee benefits and bonuses.

The Business Roundtable is a non-profit consortium of corporate CEO's that promotes public policy favorable to business interests. Their mission statement since 1997 states that "the paramount duty of management and of boards of directors is to the corporation's stockholders." The duty of corporate managers, who have stock-option compensation is "maximizing profits" for shareholders. According to Gelles and Yaffe-Bellany (2019), it can be inferred that some

corporate managers are maximizing profits in their own interest and repurchasing stock to increase their personal stock option value, because of the stock volume that managers possess. It was notable then in 2019 when The Business Roundtable revised this mission statement that corporations have a "fundamental commitment to all of our stakeholders", thus putting the interests of employees, customers, suppliers and communities on par with shareholders.

The recent COVID-19 public health crisis has created new discussions about corporate share buybacks, particularly about the federal stimulus packages to the airline industry. On March 18, (Turvill, 2020) cited the Centre of Aviation belief that most of the world's airlines would be bankrupt by the end of May 2020 without government assistance. In response to the possibility of the industry's collapse and nearly 750,000 job losses, ten U.S. airlines will receive a $25 billion bailout (Rappeport & Chokshi, 2020). The debate about whether or not taxpayers should be responsible to help bailout these companies, centers on the increased share buyback activity by major airline companies in recent years.

Although an airline industry bankruptcy could cost nearly 750,000 jobs, the four major U.S. airlines (Delta, Southwest, United, American Airlines) have repurchased nearly $39.1 billion of company shares in the last four years (Turvill, 2020). In this same four-year period, these four companies have laid-off 9,825 employees. Instead of retaining and hiring employees, these companies used free cash flow to repurchase shares and make shareholders the only beneficiaries. (Kochkodin, 2020) cites a Bloomberg report that between 2010 and 2019, American Airlines, Delta, Southwest, Alaska and United Airlines spent nearly 96 percent of free cash flow on share buybacks. This evidence provides basis for debate. If airlines were willing to spend their profits on share buybacks instead of saving cash, would they have the ability to avoid bankruptcy and weather this pandemic without government intervention?

Share buyback activity is not a contributing factor to economic growth, but recently it has contributed to stock market growth. Scholars suggest that prior to 2000, share buyback programs were an ethical approach to improve shareholder relationships. After tax legislation and repatriation programs, however, companies have used their free market power to abuse share repurchases. Whether the intent is to avoid corporate raiders or gain self-profitability, repurchasing company shares has been standardized as a potential profitability enhancing technique. The next section explores the academic research to determine how past corporate share repurchase activity may have enhance stock market returns in recent decades.

III. LITERATURE REVIEW

Corporate share repurchases are complex in nature making it difficult to estimate their effect on financial markets. Some of the important information includes artificial business growth, overpriced open market offerings, labor market effects, tax policy incentives on firm cash flow, and the impact from corporate raiders.

Company executives may decide to buyback equity from their firm for several reasons. Some studies find that companies are motivated by informational signaling, free cash flow disgorgement, dividend substitution, wealth transfer from bondholders to shareholders, and avoidance of the share dilution effect from employee stock options (Chen, Chen, & Wang, 2015). The decision in re-valuating a firm's equity stake is unique and it becomes important that all stakeholders, including employees, are considered.

The top-down decision for a company to repurchase shares has associated consequences. Lazonick (2014) goes into the current discussions about income inequality and minimum wage raises are being addressed ahead of the 2020 Presidential election with some candidates blaming the sharp increase in share buyback activity. While this conclusion is difficult to draw, it is suggested that the increased share buyback activity since the SEC ruling in 1982 has had an impact on wages. Lazonick notes that "since the late 1970's, average growth in real wages has increasingly lagged productivity growth." According to theory, increases in productivity leads to higher wage growth. Alternative factors, like share buybacks, may explain why productivity has outperformed wages for the past four decades. Corporate managers have been "managing" stock prices through repurchases and the result is "trillion dollars that could have been spent on innovation and job creation in the U.S. economy over the past three decades have instead been used to buy back shares for what is effectively stock-price manipulation." Instead of spending cash on employee salaries or benefits, corporate executives have used profits to repurchase company shares and satisfy shareholder demands. The evidence from Lazonick exemplifies the reasoning to further analyze the impact from this corporate managerial behavior.

Although some critical literature drives the understanding that share buybacks may illustrate an artificial sense of productivity to our capital markets, share repurchasing aligned shareholder interests with the company. When share buybacks were legalized in 1982 by the SEC, the intent was to establish a relationship between shareholders and managers. Shareholders look to increase their investment's wealth through management's decision to distribute profits, and share repurchases have many incentives for both parties.

After the SEC's policy, successful and, experienced investors "recognized the value of share buybacks in the right circumstances" (O'Shea & Worrall, 2005). Warren Buffett of Berkshire Hathaway has maintained ethical investment decisions that benefit society and corporate America. In his 1984 annual letter to shareholders, Buffett noted that repurchasing

undervalued stock is “encouraging and rewarding” because they portray “actions that enhance the wealth of shareholders, rather than to actions that expand management’s domain.” Buffett makes it clear to his shareholders that he has confidence in the way share buybacks could transform how stockholders are rewarded. Two years following the SEC ruling change, Buffett found that the benefits of share buybacks outweigh the costs. It needs to be noted, however, that his statement only accounts for share buyback plans with undervalued stock prices.

According to Lazonick (2014), there are two types of share buybacks: tender offers and open-market purchases. With tender offers, company officials reach out to shareholders and offer to buy back their shares at a fixed price. It is this type of share repurchase offer that Buffett refers to as “encouraging and rewarding” because it creates value for undervalued shares. Hence, tender offers can be viewed as “good” share repurchases when, measured through long-term outlook and valuation purposes. Open-market purchases are viewed as “bad” share repurchases. Most open-market purchases are at overpriced levels and companies who partake, reduce the stock value held by continuing shareholders. Lazonick cites a 1999 Berkshire Hathaway shareholder letter where Warren Buffett writes that “the continuing shareholder is penalized by repurchases above intrinsic value.”. After writing to shareholders in 1984 about the positive impact on share buybacks, the market atmosphere surrounding buybacks had changed and Buffett noticed this toxic environment. He also noted that “buying dollar bills for $1.10 is not good business for those who stick around”. Here, Buffett is speaking about the corporate decision to purchase shares on the open market and notes that these are overpriced for long-term participants. There is a short-term outlook for open-market purchases and these quick incentives for executives to increase their share value continued into the 21st century.

The tender share offers are meant for firms in need of equity capital looking to increase shareholder value. Rule 10b-18 “legalized stock market manipulation through open-market repurchases.” Open market repurchases are ruled as stock market manipulation if the company’s purchases do not exceed 25 percent of the previous four weeks’ average daily trading volume. The SEC typically enforces this ruling if they launch a special investigation on the respective company. The law has created a gray area for companies and has allowed executives to bolster share prices in the short-term. As this short-term decision can influence how companies continue to operate, it is important to evaluate the research on the impact of share buybacks.

The decision in how managers spend their profits each quarter is a determinant of wealth creation in both long and short-term for the firm. Hence it is important to understand the changes that managers have made. According to Foroohar (2016), in the 1919 *Dodge vs Ford Motor Co* case, the Dodge brothers, minority stakeholders in Ford, argued that they deserved share profits in the form of dividends. Henry Ford argued that the firm should distribute those profits to building more factories and selling more cars and noted that “my ambition is to employ still more men, to spread the benefits of the industrial system to the greatest possible number, to help them build up their lives and their homes.” He wanted to create value through tangible re-investment in his firm and show his employees that growth was imminent. Not only did Ford

create a unique automobile manufacturing process that changed the method of cars production, but he also maintained his business ethics and insisted that his company would continue to grow through stakeholder prioritization instead of shareholder profiting.

The priorities of management have changed since the *Dodge vs Ford Motor* Co case, and "'shareholder value' has become the rallying cry of many a financially oriented manager making decisions that boost a company's share price at the expense of longer-term growth" (Foroohar, 2016). In theory, the short-term financialization of profits would send a positive signal to outside investors, driving demand for stock and raising the firm's share price. The act of share repurchases cater to outside investors in practice, however raises the possibility that the use of insider information can drive unethical investing.

Some studies find there are labor power consequences associated with share repurchases because of its impact on the company's financial risk and profitability. Stock buybacks can increase the risk of financial distress for the firm, leading to possible employee layoffs. These repurchases also result in employees demanding higher wages, as the financial tool increases the firm's earnings growth. "If share repurchases motivate employees to demand more and become tougher bargainers, firms facing strong labor power may not find it beneficial to repurchase" (Chen, Chen, & Wang, 2015). Firm managers need to examine the cost of strengthened labor power and include it as a factor in the cost-benefit analysis of repurchasing shares. Managers who are misinformed or omit that variable could negatively impact the company and its financial performance.

A prime example of this type of miscalculation was illustrated by Boeing's management in 2008 in their wage negotiations with the International Association of Machinists (IAM). The IAM represents most of Boeing's machinists and Boeing had proposed a wage growth of 11 percent. "After taking stock of Boeing's record profits and its share buyback plan" the IAM demanded a 13 percent wage increase (Chen, Chen, & Wang, 2015). The executives refused to accept the proposal and Boeing's machinists had a 58-day strike. Ultimately, this strike led to a 25 percent decline in quarterly revenues and an 80 percent decline in earnings during the same quarter. This case exemplifies the potential repercussions of share buyback programs.

It is imperative to account for political influence in the evaluation of share repurchases by major corporations and the impact that they have on the financial health of that company. Fundamentally, the impact on a company's net income will simultaneously impact a shareholder's return on equity. A rise in net income, increases EPS which increases the value of each share in the company. The net income changes that represent the results from fundamental operations in a firm can be measured through Earnings Before Interest & Taxes (EBIT). Not only are competition and macroeconomic factors uncontrolled variables, but also the legislative tax rate that impacts company profits. Unfavorable economic activity triggers political action to

change the tax system. After his predecessor, President Jimmy Carter, called the tax code a "a disgrace to the human race" President Ronald Reagan signed The Tax Reform Act of 1986 which lowered the corporate tax rate from 46 to 34 percent and resulted in increased profitability. The cash remaining from profits could be distributed to shareholders directly via dividends, or through re-investments. Regardless of tangibility (share repurchases vs. tangible re-investment), this cash "distribution" turns into capital gains for shareholders. One study by Burman, Clausing, and O'Hare in 1994, determined that long-term capital gains on corporate stock realized and reported to tax authorities in December 1986 were seven times higher than reported in 1985 (Slemrod, 2018). Although this measurement represents short-term elasticity, it was notable for capital re-investment purposes and business development.

With a large tax advantage in 1986, many corporations opted to repurchase share in the years leading up to start of a new millennium. The "tech bubble" at the beginning of the century made technology company public offerings obsolete because of weak profitability. The Bush administration used a tax provision in the America Jobs Creation Act to allow U.S. corporations to repatriate foreign earnings at a tax rate of 5.25 percent instead of the top 35 percent corporate income tax rate. was incentivized to assist corporations and help expand the economy. The intention was to increase domestic investments and create more jobs. Instead, evidence from Levin & Coburn (2011) shows that increased cash flow activity was spent on stock repurchases and executive compensation. How did the profits get here? After the legislation was enacted, 843 corporations repatriated $312 billion The top five companies to repatriate made up 28 percent of total repatriations. The general result "for the 843 repatriating corporations as a whole, the average amount repatriated was roughly $429 million, while the average qualifying dividend was $370 million." Transnational corporations took advantage of the tax cut on foreign profits to repatriate cash back to the United States and used these funds to repurchase the firm's shares.

After the 1982 SEC ruling and a tax reform by the Reagan administration four years later, stock-based compensation became an important part of corporate governance. Lazonick (2014) notes that the wave of hostile takeovers in the 1980's was a "turning point" in the U.S. economy. He writes that "corporate raiders" claimed that complacent leaders were failing to maximize returns to shareholders, which resulted in corporate board of directors aligning the interests of management and shareholders through higher allocation of stock-based pay in executive compensation. Hedge fund managers with large investment pools, select large corporations with the intention to influence executives on decisions that increases their capital gain.

Carl Icahn (2015), a well-known corporate raider, wrote a letter in 2012 to Apple's CEO, Tim Cook stating that although Apple had recently bought back $80 billion in shares, the shares were still undervalued and they continued to maintain an increasing free cash position. Icahn proposed that Cook should convince the board to help solve these issues by accelerating "share repurchases in greater magnitude". This example illustrates the type of behavior activist investors can place on top executives. Icahn also noted that "Apple is very much a long term growth story from our perspective" in his explanation behind why their shares should be trading

at a premium instead of a discount. According to Baldwin (2018), Icahn earned a $2 billion capital gain after holding Apple's stock for 32 months. In essence, Icahn proposed a "long term growth story" reasoning behind Apple's share repurchases, only to support his short-term, highly profitable and personal gain. After receiving Icahn's letter, Tim Cook's decision to repurchase more Apple shares may have had personal wealth incentives attached. There could be a clear association between stock-based compensation for corporate executives and an increase in share buybacks. For instance, between 2003 and 2012 the top ten repurchasing firms spent $859 billion on buybacks accounting for 68 percent of their combined net income (Lazonick, 2014). In the same time period, the executives of these companies received $168 million each in compensation, on average. Out of this compensation, stock options accounted for 34 percent and stock awards 24 percent. These measures of executive compensation associated with buyback activity, could put together an argument that executives campaigning for share repurchases are selling the company's wealth for their own, personal wealth.

Major corporations are launching billion-dollar share buyback programs to benefit shareholders, executive compensation and corporate raiders. These companies are acquiring shares from the open market and decreasing the market's fund flows. Goetzmann and Massa (1999) cite empirical evidence from Warther (1995) that returns and flows are strongly contemporaneously correlated, based on finding no lagged relationship between market returns and subsequent monthly net flows. Essentially, if fund flows are increasing and people are investing, then stock returns will increase contemporaneously. In the case of share buybacks, fund flows are decreasing, therefore stock returns should decrease simultaneously—in theory. As the U.S. stock market has endured a bull market since the Financial Crisis in 2008-2009, there is an inverse relationship between fund flows and stock returns. As the study by Warther was in 1995, the evidence may only apply to stock market returns before share buybacks were prominent in the 21st century.

It is important to understand how this relationship has changed with new research that includes increasingly protuberant share buyback activity. This paper extracts recent data following new tax legislation, foreign repatriation, executive compensation increases and an unprecedented decade-long bull run.

IV. EMPIRICAL MODEL

Theoretical Background

Evidence from the literature finds that an increase in fund flow activity increases stock market productivity. This relationship was relevant before 2000, and before buybacks became increasingly relevant for companies. The increase in corporate share buyback activity since the

start of the new millennium suggests that this activity has driven stock market profitability. To find the stock market relationship between fund flows and share buybacks, we analyze available data on buyback activity, fund flow activity and S&P 500 data from 1998.

Capital intensive industries make different investment activities to industries that require less fixed investments. In analyzing share buybacks and other investment decisions, it is important to segment the overall market into several industries, including Industrials, Consumer, Energy, Healthcare and Technology. We analyze each sector by aggregating the common capital allocation activities across leading companies in each industry as demonstrated by their membership in the Dow Jones Industrial Average. Common investment activities that major corporations undertake include, capital expenditures (additions to property, plant and equipment), share buybacks, and research and development. The calculation explains the free cash flow investment decisions that executives make. The prominence of share buybacks is explained by how much free cash flow was being spent on a company-to-company basis. Net income is also examined in this context, as earnings play a key role in the valuation of companies via the price-to-earnings (P/E) ratio.

It is important to understand the relationship between the stock market performance across industries and the capital allocation decision and earnings performance. In theory, an emphasis on capital expenditures (CAPEX) and research and development (R&D) should help foster corporate growth. And the return on investments should help create profitability, thus resulting in stock price appreciation. Aggregating industry share prices and capital investments, including share buybacks, segments the stock market and explains how each industry is impacted by these capital allocation decisions and profitability outcomes.

Data

Part 1

The first part of this study focuses on the broader stock market relationship between domestic equity net fund flows and share buyback activity. Domestic equity net fund flows measure the volume of institutional and retail investor funds that are flowing into or out of U.S. stocks at any point in time. Domestic equity net fund flows are sourced from the Investment Company Institute (ICI) from Long-Term Mutual Fund and ETF flows in the Domestic Equity – Combined category in millions of dollars. Corporate share buybacks measure the dollar amount of repurchases made quarterly by companies in the S&P 500 Index. Buyback data was sourced from S&P Dow Jones Indices in billions of dollars. The stock market return data was calculated through the S&P 500 Index and are sourced from the Yahoo Finance database.

Part 1 Models & Results

Model 1: Mutual Fund and ETF Flows and Share Buybacks

Model 1 includes two variables to explain the S&P 500 index — corporate share buybacks, and domestic equity net fund flows. The model focuses on the post financial crisis period from 2010 and 2019 where both buyback and fund flow data are readily available. This period is notable in that it encompasses nearly the entire period when stock prices appreciated considerably in the aftermath of the financial crisis of 2007 to 2009.

Theoretical Model

$$SPX = \beta_0 + \beta_1 * Buybacks + \beta_2 * Fund\ Flows + \epsilon$$

Expected signs

Based on the literature provided, we expect Fund Flows (+) to have a positive relationship with the S&P 500 Index. Based on our hypothesis, we expect Buybacks (+) to have a positive relationship with the S&P 500 Index, but expect the relationship to be less significant than Fund Flows.

Results

Regression Statistics	
Multiple R	0.8359
R Square	0.6987
Adjusted R Square	0.6824
Standard Error	340.4472
Observations	40

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	260.9098	195.8060	1.3325	0.1908
Buybacks	12.9476	1.4524	8.9144	0.0000
Flows	-0.5194	1.7498	-0.2969	0.7682

The results of Model 1 show the relationship between the S&P 500 Index and fund flow activity and share buyback activity. Generally, the explanatory power of the model is strong with a 0.6824 Adjusted R-Square. The coefficient on Buybacks is statistically significant with a t-statistic of 8.9144. This model implies that share buybacks not only explain historical S&P 500 market returns, but also that the explanation is highly significant. Fund flow activity is not significant and the negative coefficient is contrary to the expected hypothesis. Contrary to literature before 2000, this model provides evidence that between 2010 and 2019 fund flows is not a meaningful explanatory variable in stock market returns. Just as notable is the prominence in share buyback activity, which have significantly contributed to stock market returns.

Model 2: Share Buybacks

Model 2 explains the relationship between share buybacks and stock market returns from 1998 to February, 2019. It only includes the S&P 500 Index and Share Buybacks data because of data restrictions from the fund flow statistics. On the other hand, this model allows for a larger sample size.

Theoretical Model

$$SPX = \beta_0 + \beta_1 * Buybacks + \epsilon$$

Expected Signs

Based on literature and our hypothesis, we should expect Buybacks (+) to be positively correlated with the S&P 500 Index, with no other control variables included

Results

Regression Statistics	
Multiple R	0.8249
R Square	0.6804
Adjusted R Square	0.6767
Standard Error	331.5496
Observations	88

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	710.5979	71.4180	9.9498	0.0000
Buybacks	9.0681	0.6702	13.5307	0.0000

The results of Model 2 show corporate share buybacks over a longer time from 1998. Generally, the explanatory power of the model is strong with an Adjusted R-Square of 0.6767. Not only are Buybacks positively correlated with stock market returns, but they are also statistically significant with a t-statistic of 13.5307. It is clear that buybacks are prominent in explaining the S&P 500 index over time.

Model 3: Mutual Fund and ETF Flows

Model 3 only includes the fund flows data to explain market returns as measured by the S&P 500 Index. Due to data availability, these data are limited from 2010 to 2019.

Theoretical Model

$$SPX = \beta_0 + \beta_1 * Fund\ Flows + \epsilon$$

Expected Signs

Based on literature, we expect the relationship between Fund Flows (+) and the S&P 500 Index returns to be highly significant.

Results

Regression Statistics	
Multiple R	0.2270
R Square	0.0515
Adjusted R Square	0.0266
Standard Error	596.0151
Observations	40

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	1928.9132	100.9989	19.0984	0.0000
Flows	-4.2723	2.9734	-1.4369	0.1589

The results of Model 3 show that the model has poor explanatory power with an Adjusted R-Square of 0.0266. The model shows that the association between domestic equity net mutual fund and ETF flows are not significant and the correlation with the S&P 500 Index is negative. This model is not what would have been reasonably expected in our hypothesis, based on literature that showed that fund flows are positively correlated with stock market returns up until the start of the new millennium.

Part 2

In the second part of our empirical model, we break down the broad market into five industries: Industrials, Consumers, Energy, Healthcare, and Technology. For each industry, the analysis uses available data from 1991 to 2019. Each model is an industry breakdown. This analysis uses capital expenditures (CAPEX), net income, buybacks and research and development (R&D). The financial data are sourced from Mergent Online. The stock price data are retrieved and downloaded from Yahoo Finance. Each source is compiled and organized, company by company, aggregated and indexed into the five industries listed above.

The analysis uses the financial statements of Dow 30 companies from 1982. Due to the lack of availability for some of the data, the analysis starts in 1991 and ends in 2019. Also, companies in the Financials sector, such as American Express, Goldman Sachs, JP Morgan Chase, and Traveler's were not included in the sample. This exclusion is due to limiting outlier data based on the balance sheet structure and investment activity that financial institutions have

in place. The analysis also excludes Dow and Walgreens because recent merger activity for these two companies does not provide continuity in the historical financial data.

The sample includes 22 companies in the DOW 30 Industrial, segmented into the following industries:

Industrials: 3M, United Technologies, Boeing, CAT

Consumers: Coca-Cola, Disney, Home Depot, McDonald's, Nike, Walmart

Energy: Chevron, Exxon Mobil

Healthcare: Johnson & Johnson, Merck, Pfizer, United Health

Technology: Apple, Cisco, IBM, Intel, Microsoft, Verizon

Part 2 Models & Results

Model 4: Industrials

Model 4 explores the performance of stock prices for the industrial sector with respect to CAPEX, Net Income and Buybacks. The analysis aggregates share prices of four companies: 3M, United Technologies, Boeing and CAT. It also combines these companies' capital expenditures, net incomes and share buybacks of these companies from 1991 to 2019.

Theoretical Model

$$Industrials = \beta_0 + \beta_1 * CAPEX + \beta_2 * Net\ Income + \beta_3 * Buybacks + \epsilon$$

Expected Signs

For the industrial sector, we expect CAPEX (+) and Net Income (+) to be the most significant variable in determining the stock price of the industrial sector. While we expect Buybacks (+) to be significant, it is not expected to be as significant as CAPEX and Net Income.

Results

Regression Statistics	
Multiple R	0.9551
R Square	0.9122
Adjusted R Square	0.9016
Standard Error	826.7419
Observations	29

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-567.2842	578.2698	-0.9810	0.3360
CAPEX	0.1845	0.1673	1.1029	0.2806
Net Income	0.0415	0.0539	0.7700	0.4485
Buybacks	0.1148	0.0166	6.9192	0.0000

The results of Model 4 present aggregate data of capital expenditures, net income and buybacks within the Industrials sector of the Dow 30. Overall, the explanatory power of the model is strong with an Adjusted R-squared of 0.9016. All three independent variables have a positive correlation with the industrial sector price index. But only corporate share buybacks (Buybacks) are statistically significant with a t-statistic of 6.9192. Thus, buybacks were a primary and significant driver of stock market returns in the Industrials sector over the past three decades.

Model 5: Consumer

Model 5 explores the performance of stock prices in the Consumers industry with respect to CAPEX, Net Income and Buybacks. The analysis aggregates share prices of six included companies: Coca-Cola, Disney, Home Depot, McDonald's, Nike and Walmart. It also combines the capital expenditures, net incomes and share buybacks of these companies from 1991 to 2019.

Theoretical Model

$$Consumers = \beta_0 + \beta_1 * CAPEX + \beta_2 * Net\ Income + \beta_3 * Buybacks + \epsilon$$

Expected Signs

For the Consumers industry we expect CAPEX (+) and Buybacks (+) to be significant explanatory variables. Because of the cyclical industry, however, we expect Net Income to have a higher significance in determining the industry's overall share price index.

Results

Regression Statistics	
Multiple R	0.9611
R Square	0.9236
Adjusted R Square	0.9145
Standard Error	4075.4647
Observations	29.0000

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	2447.6312	2308.1725	1.0604	0.2991
CAPEX	-0.6999	0.2501	-2.7989	0.0097
Net Income	-0.1194	0.1942	-0.6150	0.5441
Buybacks	0.4434	0.0558	7.9474	0.0000

The results of Model 5 presents aggregate data of capital expenditures, net income and buybacks within the Consumer sector of the Dow 30. The explanatory power of the model is strong with an Adjusted R-square of 0.9145. Share buybacks (Buybacks) have a positive correlation with the industry's returns and are statistically significant with a t-statistic of 7.9474. Contrary to our hypothesis, CAPEX is statistically significant, but with a negative coefficient that is counterintuitive. This can be interpreted that CAPEX has a negative impact on share prices.

Model 6: Energy

Model 6 explores the Energy's industry stock price performance with respect to CAPEX, Net Income, Buybacks, and R&D. The analysis aggregates share prices of two included companies: Chevron and Exxon Mobil. It also combines these companies' capital expenditures, net incomes, share buybacks and research and development of these two companies from 1991 to 2019.

Theoretical Model

$$Energy = \beta_0 + \beta_1 * CAPEX + \beta_2 * Net\ Income + \beta_3 * Buybacks + \beta_4 * R\&D + \epsilon$$

Expected Signs

Because of the nature of the Energy sector, we expect that CAPEX (+) and R&D (+) would be positively correlated with the price index of the sector. We also expect Net Income (+) and Buybacks (+) to show positive correlations, but to be less significant than what we expect from CAPEX and R&D.

Results

Regression Statistics	
Multiple R	0.9586
R Square	0.9190
Adjusted R Square	0.9055
Standard Error	402.3191
Observations	29.0000

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	205.0756	250.8160	0.8176	0.4216
CAPEX	-0.0167	0.0128	-1.2976	0.2068
Net Income	0.0115	0.0051	2.2452	0.0342
Buybacks	0.0130	0.0019	6.9432	0.0000
R&D	0.2296	0.2196	1.0457	0.3061

The results of Model 6 show aggregate data of capital expenditures, net income, buybacks and research and development within the Energy sector of the Dow 30. With an Adjusted R-squared of 0.9055, the explanatory power of this model is strong. Three independent variables, Net

Income, Buybacks and R&D, have a positive correlation with the energy sector price index. Only Net Income and Buybacks, however are statistically significant with t-statistics of 2.2452 and 6.9432, respectively. These results indicate that buybacks mostly explain stock price performance in the energy industry. Furthermore, the results support the hypothesis that corporate share repurchase activity have been driving Energy stock prices.

Model 7: Healthcare

Model 7 explores the performance of stock prices in the Healthcare industry with respect to CAPEX, Net Income, Buybacks, and R&D. The analysis aggregates share prices of four included companies: Johnson & Johnson, Merck, Pfizer, United Health. It also combines the capital expenditures, net income, share buybacks and research and development of these four companies from 1991 to 2019.

Theoretical Model

$$Healthcare = \beta_0 + \beta_1 * CAPEX + \beta_2 * Net\ Income + \beta_3 * Buybacks + \beta_4 * R\&D + \epsilon$$

Expected Signs

We expect all four variables to be positively correlated with the dependent variable, healthcare: that R&D (+) CAPEX (+), Net Income (+), and Buybacks (+). Given the nature of the healthcare industry we expect R&D (+) would be the most significant explanatory variable in the model.

Results

Regression Statistics	
Multiple R	0.9299
R Square	0.8647
Adjusted R Square	0.8421
Standard Error	1813.8911
Observations	29.0000

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-220.0182	1027.4823	-0.2141	0.8323
CAPEX	0.4641	0.2154	2.1547	0.0414
Net Income	-0.1282	0.0751	-1.7066	0.1008
Buybacks	0.0917	0.0242	3.7900	0.0009
R&D	0.0201	0.1210	0.1657	0.8698

The results of Model 7 presents aggregate data of capital expenditures, net income, buybacks and research and development within the Healthcare sector of the Dow 30. The explanatory power of the model is strong with an Adjusted R-squared of 0.8421. While the independent variables, CAPEX, Buybacks and R&D have a positive correlation with the Healthcare sector price index, only CAPEX and Buybacks are statistically significant, with a t-statistics of 2.1547 and 3.7900, respectively. Notably, R&D is not statistically significant in explaining the stock price performance of the healthcare sector. The negative correlation of Net Income counterintuitive, but the variable is not statistically significant. Overall, Buybacks is the most statistically significant variable in this model, indicating that buyback activity is driving the stock prices of Healthcare companies.

Model 8: Technology

Model 8 examines the Technology's industry stock price performance with respect to CAPEX, Net Income, Buybacks, and R&D. The analysis aggregates share prices of five included companies: Apple, Cisco, IBM, Intel, Microsoft. It also combines capital expenditures, net incomes, share buybacks and research and development in the five companies from 1991 to 2019.

Theoretical Model

$$Technology = \beta_0 + \beta_1 * CAPEX + \beta_2 * Net\ Income + \beta_3 * Buybacks + \beta_4 * R\&D + \epsilon$$

Expected Signs

All four independent variables are expected to show a positive correlation with the independent variable, technology: CAPEX (+), Net Income (+), Buybacks (+), and R&D (+). We expect,

however, that R&D (+) and Buybacks (+) would be the more significant variables in the model because of the low intensity in fixed capital and continued innovation throughout the industry. We expect that CAPEX (+) and Net Income (+) would have positive correlations, but less explanatory than R&D and Buybacks.

Results

Regression Statistics	
Multiple R	0.8744
R Square	0.7646
Adjusted R Square	0.7253
Standard Error	1736.8980
Observations	29.0000

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-1390.1246	1606.8437	-0.8651	0.3955
CAPEX	-0.0069	0.1043	-0.0659	0.9480
Net Income	-0.0116	0.0347	-0.3333	0.7418
Buybacks	-0.0066	0.0268	-0.2467	0.8072
R&D	0.2684	0.2213	1.2131	0.2369

The results of Model 8 show aggregate data of capital expenditures, net income, buybacks and research and development within the Technology sector of the Dow 30. The explanatory power of the model is strong with an Adjusted R-squared of 0.7253. Except for R&D, the independent variables have a negative correlation with the price index of the technology sector. On the other hand, none of these variables are statistically significant in determining technology share prices.

Summary of Results

The results of these various models support the hypothesis that corporate share buyback activity over the past three decades has driven stock prices within the broader market and many of its underlying sectors. Moreover, some areas of the market are not exhibiting the same association between corporate share buyback activity and stock prices.

The results in each part of this analysis, however, have limitations that merit discussion. In the first part of modeling, data availability for all years is lacking. While buybacks data goes back to 1998, the domestic equity net mutual fund and ETF flows data only goes back to 2010. In Model 1, the combination of fund flows and buybacks only goes back to 2010. This relatively limited time frame could lead to an incorrect conclusion of correlation and significance between the independent and dependent variables.

In part 2, there are also some limitations in several parts. This analysis contains some of the largest U.S. companies found in the Dow Jones Industrial Average. If this analysis were to include a broader range of companies such as those found in the S&P 500 Index, then sample size would be larger and it is possible that the results could be different. In Models 4 (Industrials) and 5 (Consumers), we also exclude research and development (R&D). Most companies in these sectors do not list R&D as an expense of their Income Statement. An examination of the separate models for each industry may show skewed results for the Energy, Healthcare and Technology sectors. In adding another independent variable, the remaining variables' relationships may have different relationships.

We focus on large transnational companies because our research finds evidence that these companies are strong indicators for the U.S. stock market's returns. If our analysis had included small-cap U.S. companies, where share buybacks are less prevalent, then the results could be different and we would draw different conclusions.

V. CONCLUSION

The recent increase in corporate share buyback activity has been influential in stock market performance. Evidence from the literature suggests that such traditional financial indicators as domestic equity net fund flows, are positively correlated with stock market returns. The empirical evidence in this paper, however, vindicates that not only are corporate share repurchases statistically significant in explaining S&P 500 returns, but also that domestic equity fund flows no longer have a positive relationship.

The empirical models in Part I of the analysis find that domestic equity fund flows are not statistically significant in determining S&P 500 returns. Prior to 2000, the literature did find evidence for this relationship. The recent prominence is share repurchases, however, questions the relationship between domestic equity fund flows and S&P 500 stock performance. Empirical evidence in Part I finds that corporate share buybacks are statistically significant in explaining S&P 500 returns.

The empirical model in Part II of the analysis use aggregated data from five major industries to find relationships between share price indices and capital allocations. Four of the models—Industrials, Consumers, Energy, Healthcare industries—confirm a positive relationship and statistically significant relationship between buyback activity and the share price index in these industries. For Industrials and Consumers industries, share buybacks are more indicative of stock returns than net income and capital expenditures. Buybacks are more suggesting than net income, capital expenditures, and research and development in Energy and Healthcare industries. Net income, capital expenditures and research and development are traditional indicators in explaining corporate earnings and stock prices. Evidence from this empirical model in this paper, however, confirm the significance of share buybacks in industry index returns.

Although corporate share buybacks have a fundamental purpose in increasing the price undervalued stocks, major corporations have increased share buyback plans to record levels in the past decade. With evidence that these buyback plans explain S&P 500 market returns, should the SEC impose share buyback plan limitations on corporations?

In light of the recent federal bailouts for the airlines industry, airline companies may not have required federal stimulus if the SEC had imposed buyback plan restrictions. Although no one expected the COVID-19 pandemic, companies should be responsible in adapting to a contraction in economic activity, and possibly, a recession. Instead of being more responsible, major corporations are relying on taxpayer money to save their own entity from bankruptcy. A change in policy is the necessary solution.

The SEC should consider taking an aggressive approach in changing corporate share repurchase policy. Companies partaking in corporate share buyback activity would have limitations placed on the number of shares that could be repurchased. The SEC should also consider restricting companies from open market repurchases, where shares are being bought at overvalued prices. Penalties imposed on corporations to repurchase shares will then incentivize companies to allocate free cash flow towards capital expenditures, research and development and employee wages. With evidence that corporate share buyback activity is explaining stock market returns, disincentives will help limit this relationship. Stock market returns can revert to the traditional explanation of being driven by such fundamental indicators as domestic equity fund flows. A return to business fundamentals will provide a more natural stock market and limit federal bailouts that use taxpayer money.

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