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# STOCK BUYBACK MOTIVATIONS AND CONSEQUENCES

## A LITERATURE REVIEW

ALVIN CHEN AND  
OLGA A. OBIZHAEVA



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# Stock Buyback Motivations and Consequences: A Literature Review

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# 1. Introduction

Few corporate policies have generated as much controversy in recent years as stock buybacks. Once an infrequently used form of payout policy, stock buybacks have become the dominant form of payout in the new century (Skinner 2008). S&P 500 Index companies alone bought back more than \$800 billion worth of shares in 2018; **Figure 1** displays the dynamics of S&P 500 corporate payouts over the 1998–2020 period. The recent surge in buyback activity, driven partly by the Trump administration’s corporate tax cuts that allowed US companies to repatriate \$1 trillion from overseas, has reignited discussions about the validity of stock buybacks.

Opponents of stock buybacks argue that the practice overwhelmingly benefits top executives. In March 2019, US senator Tammy Baldwin introduced the Reward Work Act, which would ban open-market stock buybacks. She argued that “it’s just wrong for big corporations to pocket massive, permanent tax breaks and reward the wealth of top executives with more stock buybacks, while closing facilities and laying off workers.”<sup>1</sup>

Proponents of stock buybacks point out that share repurchases give companies the flexibility to return excess cash to shareholders, who can then reinvest the money in other opportunities. Warren Buffett has noted that

as the subject of repurchases has come to a boil, some people have come close to calling them un-American—characterizing them as corporate misdeeds that divert funds needed for productive endeavors. That simply isn’t the case. . . . I’m not aware of any enticing project that in recent years has died for lack of capital. (Call us if you have a candidate.)<sup>2</sup>

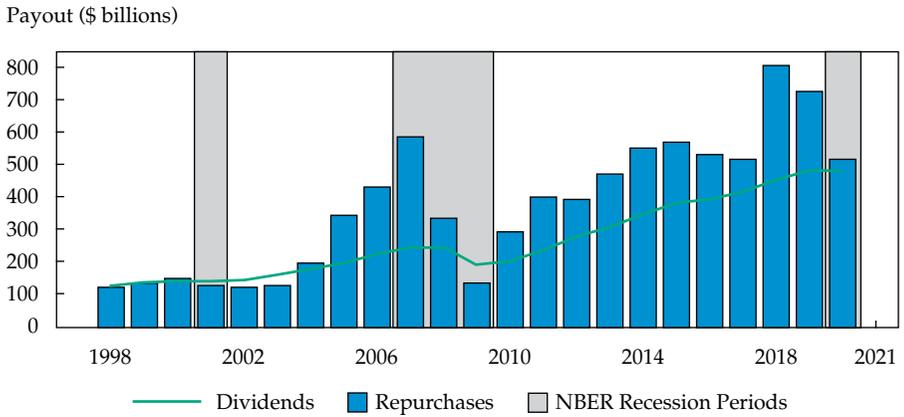
We take a step back from the heated public discussions and survey important research on the topic of stock buybacks in academic and practitioner-oriented journals. The remainder of the paper is organized as follows. Chapter 2 outlines the mechanics of share repurchases and introduces different types of repurchase programs. Chapter 3 reviews historical trends in share repurchase payouts. Chapter 4 discusses motives for why companies repurchase shares and reviews relevant theoretical and empirical research. Chapter 5 introduces the main data sources that are used in share buyback research and discusses data limitations. Chapter 6 concludes.

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<sup>1</sup>See press release at [www.baldwin.senate.gov/press-releases/reward-work-act-2019](http://www.baldwin.senate.gov/press-releases/reward-work-act-2019).

<sup>2</sup>See 2016 Berkshire Hathaway shareholders letter at [www.berkshirehathaway.com/letters/2016ltr.pdf](http://www.berkshirehathaway.com/letters/2016ltr.pdf).

**Figure 1. Dynamics of Share Repurchase and Dividend Payouts by S&P 500 Companies, 1998–2020**



*Notes and Sources:* Payout data are from Standard & Poor's Global. The light grey areas indicate recession periods as identified by the National Bureau of Economic Research; these data are from the NBER's US Business Cycle Expansions and Contractions table ([www.nber.org/research/data/us-business-cycle-expansions-and-contractions](http://www.nber.org/research/data/us-business-cycle-expansions-and-contractions)).

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## 2. Mechanics of Share Repurchases

In a share repurchase, a company buys back some of its shares, which are then retired or held as treasury stock. If retired, the repurchased shares lose their rights to voting and cash flows. If held as treasury stock, the repurchased shares lose their rights to voting and cash flows until they are reissued. Although there are many ways to buy back shares, doing so through an open-market repurchase program is the most prevalent (Grullon and Ikenberry 2000; Bargeron, Kulchania, and Thomas 2011). Because of their popularity in practice, open-market repurchase programs have also been the focus of academic studies. Other methods include fixed-price tender offers, Dutch auction tender offers, privately negotiated repurchases, and accelerated share repurchases.

### Open-Market Repurchases

When companies buy back their shares, they overwhelmingly choose to do so in an open-market repurchase (OMR) program. Historically, companies rarely repurchased shares in the open market because of potential liabilities related to price manipulation. In the past few decades, however, many regulatory authorities have adopted rules that shield companies against such liabilities. For instance, SEC Rule 10b-18, which was adopted in 1982, provides a “safe harbor” for US-listed companies to repurchase their shares in the open market under certain conditions related to the manner, timing, price, and volume of repurchase.<sup>3</sup> Cook, Krigman, and Leach (2003) provide an analysis of OMR regulations in the United States, and Kim, Schremper, and Varaiya (2005) provide a survey of regulations related to OMRs in Japan, the United Kingdom, France, Germany, Canada, Italy, the Netherlands, Switzerland, and Hong Kong.<sup>4</sup>

Despite the restrictions imposed by OMR guidelines, companies still have substantial discretion over the implementation of OMR programs. First, companies are not obliged to actually repurchase shares during an OMR. Evidence suggests that companies exercise this discretion. Stephens and Weisbach (1998) estimated the median completion rate of OMRs in the United States to be below 50%. Moreover, Bhattacharya and Jacobsen

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<sup>3</sup>See the SEC’s “safe harbor” Rule 10b-18 under the Securities Exchange Act of 1934 at [www.sec.gov/rules/final/33-8335.htm](http://www.sec.gov/rules/final/33-8335.htm).

<sup>4</sup>For more details on share repurchases in the European Union related to the Market Abuse Directive (MAD) regulation of share repurchases, see Drousia, Episcopos, Leledakis, and Pyrgiotakis (forthcoming).

(2015) found that 24% of all OMRs in the United States between 1985 and 2012 did not involve any actual buybacks in the fiscal year of the announcement. The estimated completion rates of OMRs in other markets are similarly low. For example, Ikenberry, Lakonishok, Vermaelen (2000) provide an estimate of 28.6% for the median completion rate of OMRs in Canada. Rau and Vermaelen (2002) estimated a completion rate of 37% for OMRs in the United Kingdom. Second, companies do not adhere to a strict schedule when they repurchase shares. Evidence shows that when companies do buy back shares, they do not do so on every trading day or in every trading month (Brockman and Chung 2001; Cook, Krigman, and Leach 2004; Dittmar and Field 2015). The additional discretion in the execution of the buyback is a distinguishing feature of OMRs.

## Tender Offers

Two main types of repurchase tender offers (RTOs) are fixed-price offers and Dutch auction offers. In a fixed-price RTO, the company offers to repurchase a specified number of shares at a single specified price. If the shares tendered exceed the size of the repurchase program, the company can either increase the size or buy back shares from each tendering shareholder on a prorated basis.

In a Dutch auction RTO, the company also repurchases shares at a single price, but this price is set at the end of the tendering process rather than at the beginning. Specifically, the company offers a range of prices at which it is willing to buy back shares. Tendering shareholders indicate the lowest price they are willing to accept for their shares. The Dutch auction tender offer is executed at the lowest price that allows the company to repurchase the pre-specified number of shares. Unlike OMRs, RTOs involve a firm commitment to repurchase shares.

## Privately Negotiated Repurchases

A privately negotiated repurchase (PNR) involves the buyback of stock from a single investor or a small group of targeted investors. These investors tend to have large holdings of the company's stock. Peyer and Vermaelen (2005) analyzed 737 PNRs in the United States between 1984 and 2001 and report that the typical seller in a PNR held, on average, 14% of shares outstanding. In many instances, the seller initiates a privately negotiated repurchase by proposing a sale to the company.

## **Accelerated Share Repurchase**

A company executes an accelerated share repurchase (ASR) by entering into a contractual agreement to immediately purchase a specified number of shares at a specified price from a financial intermediary. Typically, the financial intermediary borrows the shares from large investors and covers the short position by buying shares in the open market over a period of time (see Barger et al. 2011 for a more detailed discussion of typical ASR agreements).

In contrast to other types of buybacks, an ASR involves the immediate execution of the stock buyback.<sup>5</sup> The commitment to repurchase rapidly is an important characteristic of ASRs.

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<sup>5</sup>Note that ASRs and OMRs are not mutually exclusive. Barger et al. (2011) point out that a quarter of the ASRs in their sample were announced during an ongoing OMR.

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## 3. Historical Trends in Share Repurchases

Throughout the 20th century, companies overwhelmingly favored paying dividends over other payout policies. This preference has puzzled researchers ever since the seminal work of Black (1976). Indeed, share repurchase confers a tax advantage over dividend distribution because taxes on capital gains tend to be much lower than taxes on income. Not until the end of the 20th century, however, did share repurchase become the dominant form of payout.

The catalyst for increased share repurchase activity in the United States was the adoption of SEC Rule 10b-18 in 1982 (Grullon and Ikenberry 2000; Grullon and Michaely 2002). Prior to that rule's adoption, companies avoided repurchasing shares because of the risks of violating the anti-manipulative provisions of the Securities Exchange Act of 1934. The value of US share repurchases tripled a year after the adoption of the safe harbor rule and continued to rise afterward. The surge in share repurchase activity is almost entirely accounted for by open-market repurchase programs (Grullon and Ikenberry 2000).

Many researchers have analyzed the evolution of corporate payouts over the past few decades.<sup>6</sup> In particular, Grullon and Michaely (2002) document several trends in corporate payout policy in the United States from 1972 to 2000. Using a sample of 15,834 companies from the Industrial Compustat file, they show that the proportion of companies that repurchased shares increased from less than 27% in 1972 to more than 84% in 2000. In the same time period, the proportion of companies that paid dividends decreased from 60% to 20%.<sup>7</sup> Moreover, the average repurchase ratio, a measure of the amount of cash paid out via stock buybacks in a given year, increased from 2.8% in 1972 to 12.4% in 2000, whereas the average dividend ratio declined from 21.4% to 11.3% over the same period. This evidence indicates that share repurchase had become the dominant form of payout by the beginning of the 21st century. In fact, as early as 1998, the dollar value of stock repurchases exceeded that of dividend payouts in the United States for the first time (Grullon and Ikenberry 2000).

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<sup>6</sup>See, for example, Jagannathan, Stephens, and Weisbach (2000), who analyzed dividend and share repurchase distributions over the 1985–96 period; Skinner (2008), who described the evolution of earnings, dividends, and share repurchases for 1980–2005; and Kahle and Stulz (2021), who studied aggregate corporate payouts for 1971–2019.

<sup>7</sup>Fama and French (2001) document the disappearance of regular dividends. They found that this trend cannot be explained by changing characteristics of publicly traded companies. DeAngelo, DeAngelo, and Skinner (2000) document the disappearance of special dividends.

We reexamine the trends in corporate payout policy thus far in the 21st century and confirm previous findings. Figure 1 displays the evolution of aggregate dollar value of share repurchases and dividend payouts by S&P 500 companies over the 1998–2020 period. Although dividends remain important, share repurchases make up the majority of corporate payouts.

Similar dynamics in share repurchase activity are present around the world. Von Eije and Megginson (2008) studied the evolution of payout policies in 15 EU markets from 1989 to 2005. Share repurchase activities experienced significant growth in the European Union, as they did in the United States. In most markets in the EU, however, share repurchases did not become a significant form of payout until after 1998. In several markets, such as France and Germany, OMRs were either illegal or difficult to implement prior to 1998 (Lee and Suh 2011). The notable exception is the United Kingdom, where share buybacks were historically used as a payout method. Lee and Suh (2011) analyzed repurchase activities in Australia, Canada, France, Germany, Japan, the United Kingdom, and the United States for 1998–2006 and report similar patterns in these markets.

The historical trends in companies' payout policies provoke discussion of whether dividends and share repurchases may be viewed as *substitutes* (Bagwell and Shoven 1989). Interviews and survey responses in Brav, Graham, Harvey, and Michaely (2005) reveal that most executive managers do not view dividends and share repurchases as one-for-one substitutes. Only 20% (5%) of executives responded positively when asked whether their company repurchased shares (paid dividends) with funds that they would otherwise have used to pay dividends (repurchase shares). There is no consensus, however, on this question among academic researchers. DeAngelo, DeAngelo, and Skinner (2000) studied "special dividends," which were a popular form of payout among NYSE firms until the 1960s. The authors document the disappearance of special dividends by the middle of the 1990s but found little evidence that special dividends were substituted with share repurchases. Other researchers have found support for the substitution hypothesis. Grullon and Michaely (2002) used the Lintner (1956) dividend model to estimate firms' expected dividend payments and found that dividend forecast error is negatively correlated with amount of share repurchase. Skinner (2008) connected payouts to earnings and reports that over long horizons (two or three years), the level of earnings drives the magnitude of buybacks, as it does other forms of payout. Furthermore, he documented a stronger (weaker) relationship between earnings and amount of share repurchases (dividends) in the sample of firms that used both forms of payout. Importantly, Jagannathan, Stephens, and Weisbach (2000) report that, although dividends are paid from cash

flows that are likely to be permanent, share repurchases are largely paid from temporary cash flows (see also Guay and Harford 2000). These findings are consistent with some substitution between dividends and share repurchases.

The surge in share repurchase activity has also renewed interest in the asset pricing implications of corporate payouts (Boudoukh, Michaely, Richardson, and Roberts 2007; Straehl and Ibbotson 2017). Investment professionals and academic researchers have long noted a relationship between dividend yield and long-horizon aggregate stock returns (see Dow 1920; Fama and French 1988; Cochrane 2008; and a comprehensive review of the literature on return predictability in Boudoukh, Richardson, and Whitelaw 2008).<sup>8</sup> However, the predictive power of dividend yield has declined over time (Goyal and Welch 2003; Boudoukh et al. 2008). Pointing to the evolution of aggregate payouts and substitution between dividends and share repurchases, Boudoukh et al. (2007) posit that the total payout yield, which accounts for both dividends and share repurchases, predicts aggregate returns better than dividend yield alone does. Consistent with this hypothesis, the authors found stronger predictability when using total and net payout yields.<sup>9</sup> High total and net payout yields were associated with higher market returns. They also report that total and net payout yields predict stock returns in the cross section. They applied their results to the *Dogs of the Dow* self-financed trading strategy, which goes long high-yield stocks and short low-yield stocks. The modified *Dogs of the Dow* strategy based on net (total) payout yield delivered an average annual return of 4.44% (3.36%), which is higher than the average annual return of 2.16% delivered by the classic strategy based on dividend yield. This evidence suggests that share repurchase activity matters for stock return predictability.

## Time-Series Patterns

Dividends are smooth and grow steadily, consistent with the famous Lintner (1956) argument, but share repurchases appear to vary with the business cycle; they increase during booms and decrease during busts. Figure 1 illustrates this pro-cyclical pattern (see also Jagannathan et al. 2000 and Dittmar and Dittmar 2008).

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<sup>8</sup>The relationship may be described by the Gordon growth model, which implies that the time variation in the dividend-to-price ratio must be explained by either time-varying expected return or time-varying expected dividend growth. The lack of predictability of dividend growth implies that the variation in the dividend–price ratio must be the result of time-varying expected returns (Cochrane 2008).

<sup>9</sup>Over the 1926–2003 period, models based on total (net) payout yields had an  $R^2$  of 9.1% (26%), compared with an  $R^2$  of 5.5% for a classic model based on dividend yield. The net payouts term is computed as dividends plus repurchases less equity issuance.

According to the NBER chronology, three US recessions occurred in the sample period. The first is the recession after the dot-com bubble and crash from March 2001 to November 2001. The second is the Financial Crisis recession from December 2007 to June 2009. The third is the recent recession caused by the COVID-19 pandemic. Thus, there are three periods of economic growth and three periods of economic recession in our sample.

The pro-cyclical pattern of share repurchases is striking. During the dot-com bubble, the aggregate value of share repurchases by S&P 500 companies increased from \$126 billion in 1998 to \$150 billion in 2000. It then decreased to \$132 billion during the recession after the dot-com crash in 2001. In the run-up to the Financial Crisis, the aggregate value of share repurchases by S&P 500 companies increased rapidly, from \$127 billion in 2002 to \$589 billion in 2007. During the recession that followed, aggregate share repurchase activity by S&P 500 companies dropped back—to \$137 billion by 2009. In the quiet decade that followed the Financial Crisis, remarkable growth took place in share repurchase activity. In 2018 and 2019, S&P 500 companies repurchased, respectively, \$806 billion and \$728 billion. Our data sample ends with the COVID-19 recession, during which the aggregate value of share repurchases dropped to \$520 billion.

Dittmar and Dittmar (2008) studied the pro-cyclical patterns of share repurchases. They noted that the aggregate levels of share repurchase and equity issuance, which represent opposite transactions, were actually positively correlated in their broad sample of US companies from 1971 to 2004. This evidence suggests that aggregate undervaluation is unlikely to account for these patterns. Instead, Dittmar and Dittmar posit that the financial flexibility and tax advantages offered by OMRs are more valuable during booms than in quiet times or busts. They show that, consistent with their view, GDP growth and its volatility predict aggregate repurchase activity.

## **Cross-Sectional Patterns**

In this section, as we review the cross-sectional patterns of share repurchase activity, we focus particularly on company characteristics that are associated with stock buybacks. Skinner (2008) argues that the cross-sectional variation in payout policies is driven by factors such as dividend history, past stock returns, employee stock options, and volatility.<sup>10</sup> Grullon and Michaely (2002) provide four classifications of payout policies: (1) dividend paying, (2) repurchasing, (3) dividend paying and repurchasing, and (4) nonpaying. They document several relationships between company characteristics and

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<sup>10</sup>We provide a detailed discussion of various motivations for share repurchases in Chapter 4.

payout policy. Dividend-paying companies (Groups 1 and 3) are larger, are more profitable, and have less volatile returns on assets than do companies that pay no dividends (Groups 2 and 4). Those that only repurchase shares (Group 2) tend to be small companies with high market-to-book ratios and high earnings volatility. These companies have similar characteristics to non-paying companies (Group 4). Consistent with the intuition that earnings volatility is important for choice of payout method, the authors found that firms that only repurchase (Group 2) have higher earnings volatility than firms that only pay dividends (Group 1).<sup>11</sup> Kahle and Stulz (2021) show that payout models calibrated on the basis of data from 1979 to 1999 provide accurate out-of-sample predictions for company payout policies from 2000 to 2017.<sup>12</sup> These payout models based on company characteristics can explain well both the rise in aggregate payouts and the increase in aggregate share repurchase activities shown in Figure 1. Overall, the empirical evidence highlights the importance of company characteristics in explaining share repurchase activity.

Repurchase activities also exhibit clustering by industry. Massa, Rehman, and Vermaelen (2007) propose a *mimicking* hypothesis to explain these patterns: The announcement of an OMR signals good news for the announcing company and implies relatively bad news for rival companies. As a result, rival companies announce their own OMRs in order to counter the market's lowered expectations for their companies' competitive position in the industry. Massa et al. analyzed a broad sample of US companies from 1984 to 2002 and provide evidence in support of the hypothesis. They found that the announcement of an OMR has a positive effect on the stock price of the announcing company and a negative effect on the stock prices of other companies in the same industry but only if the industry is concentrated (see Hertzfel 1991 and Erwin and Miller 1998 for related evidence). Moreover, they show that one company's announcement of an OMR increases the likelihood of rival companies following with their own OMR announcements if the industry is concentrated; the rival OMR-announcing companies do not experience abnormal positive long-run returns. Some studies report contrasting results. For example, Akhigbe and Madura (1999) examined OMRs in the banking industry from 1978 to 1995 and found that one bank's OMR announcement had a positive effect on the stock prices of its rivals.<sup>13</sup> These results suggest

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<sup>11</sup>This result is consistent with findings in Jagannathan et al. (2000).

<sup>12</sup>The authors acknowledge that these payout models do not fully capture the abnormal spike in payout activity resulting from the Tax Cuts and Jobs Act of 2017.

<sup>13</sup>See Nguyen, Nguyen, and Pham (2019) and Chang, Lai, and Yu (2005) for similar evidence from, respectively, Vietnam and Taiwan.

that the intra-industry effect of share repurchases depends on industry-level factors.

Management plays a major role in setting a company's payout policy, and researchers have investigated the link between characteristics of a company's executives and its payout policy. Custodio and Metzger (2014) document that the CEOs with more financial expertise hold less cash and are more likely to repurchase shares than pay dividends. Faulkner and Garcia-Feijóo (forthcoming) provide evidence that companies with more cautious CEOs adopt more conservative payout policies and are more likely to repurchase shares than pay dividends.<sup>14</sup> Overall, the evidence suggests that CEO characteristics are also important determinants of corporate stock buyback activity.

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<sup>14</sup>These authors identified as cautious a CEO's experience-driven conservatism based on that CEO's experience with corporate distress in a previous non-CEO position at a different firm.

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## 4. Motivations for Stock Buybacks

Companies buy back stock for many different reasons (Dittmar 2000; Grullon and Ikenberry 2000). Executives cite undervaluation of the company's stock, signaling, financial flexibility, availability of excess cash, and risk management as some important drivers of their stock buyback decisions (Brav et al. 2005). In this chapter, we review the research examining these motives as well as some motives rarely mentioned by executives, such as managerial compensation and takeover deterrence.

### Undervaluation

In his 2011 letter to Berkshire Hathaway shareholders, Warren Buffett said that he

favors repurchases when two conditions are met: First, a company has ample funds to take care of the operational and liquidity needs of its business; second, its stock is selling at a material discount to the company's intrinsic business value, conservatively calculated.<sup>15</sup>

Consistent with this view, 86.4% of executives surveyed by Brav et al. (2005) cited stock undervaluation as one of the most important factors for their repurchase decisions.<sup>16</sup>

Academic research also supports this view. Companies tend to repurchase shares after their stock prices fall (Comment and Jarrell 1991; Ikenberry, Lakonishok, and Vermaelen 1995; Stephens and Weisbach 1998; Jagannathan et al. 2000; Peyer and Vermaelen 2009). For example, Peyer and Vermaelen examined 3,481 OMRs in the United States from 1991 to 2001 and report that companies, on average, experienced a  $-9.05\%$  return in the six-month period before their OMR announcements and report positive abnormal returns in the period afterward.<sup>17</sup> They also report that the companies with the most negative returns in the pre-repurchase period experienced the highest abnormal long-run returns in the post-repurchase period. Lee, Park, and Pearson (2020) examined a large sample of more recent OMRs

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<sup>15</sup>The letter is available at [www.berkshirehathaway.com/letters/2011ltr.pdf](http://www.berkshirehathaway.com/letters/2011ltr.pdf).

<sup>16</sup>The survey includes responses from 384 executives from 256 public companies.

<sup>17</sup>They estimated positive and statistically significant cumulative abnormal returns (CARs) of 2.6%, 10.54%, 18.64%, and 24.25% at, respectively, 12 months, 24 months, 36 months, and 48 months. The CARs were calculated relative to the Fama and French (1993) and Pastor and Stambaugh (2003) factors. Peyer and Vermaelen (2009) also investigated 141 repurchase tender offers in the United States from 1987 and 2001 and document similar patterns.

and report that the pattern is weaker in the new millennium. They interpret their findings as evidence that stock buybacks after 2001 are more likely to reflect nonfundamental motives, such as managerial self-interest, rather than such fundamental motives as undervaluation or changes in risk. Peyer and Vermaelen argue that their findings support the *overreaction* hypothesis, which posits that companies use buybacks in response to the market's overreaction to bad news (see also Ikenberry et al. 1995; Stephens and Weisbach 1998; Ikenberry et al. 2000; Ben-Rephael, Oded, and Wohl 2014; and Lee et al. 2020 for more related evidence).

Note that managers themselves are not immune to errors and biases. Chen and Wang (2012) used a large sample of OMRs in the United States from 1990 to 2007 to investigate how financially constrained companies fare after buyback programs. They report that financially constrained companies with the more overconfident managers buy back more shares and perform more poorly after buybacks.<sup>18</sup> Their results indicate that overconfident managers tend to overestimate their companies' future prospects (see Andriosopoulos, Andriosopoulos, and Hoque 2013 and Chen and Lu 2015 for similar evidence in, respectively, the United Kingdom and Taiwan).

Hong, Wang, and Yu (2008) propose that companies use OMRs to act as *buyers of last resort*, thus providing price support when prices fall far below fundamental value as a result of large negative liquidity shocks to investors.<sup>19</sup> They point to the coordinated efforts of many companies and stock exchanges to implement share repurchases to stabilize the market after the events of 11 September 2001 as a prominent example. In addition, they show that companies with more freedom to repurchase shares have lower short-run return variances.<sup>20</sup> The *buyers of last resort* hypothesis of OMRs is also consistent with the robust finding that companies tend to buy more shares when prices fall (Stephens and Weisbach 1998; Ikenberry et al. 2000; Ben-Rephael et al. 2014).

The *overreaction* and *buyers of last resort* hypotheses illustrate how the undervaluation motive for repurchasing shares does not require the management to have private information about the company's fundamentals. Managers may buy back shares because they disagree with an overly negative

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<sup>18</sup>They followed the literature and proxied for a manager's overconfidence by using the manager's failure to exercise vested, in-the-money stock options.

<sup>19</sup>See also the section "Stock Liquidity" in this chapter for a discussion of how share repurchases affect stock liquidity.

<sup>20</sup>They show that this relationship holds in the time series after the 1982 passage of SEC Rule 10b-18 in the United States and across markets when market-level differences in the legality of stock buybacks were used.

assessment by the market (Peyer and Vermaelen 2009). They may also buy back shares to counter stock price declines resulting from negative liquidity shocks in the market (Hong et al. 2008). We discuss the importance of private information as a driver of share repurchases in the next section.

## Signaling

As part of overseeing a company's activities, its managers often acquire private information about the company's fundamentals. In particular, a company's managers may possess positive private information that is not easily disclosed. For instance, managers may have high expectations based on proprietary market research for an upcoming product launch; credibly conveying their high expectations might require disclosing the details of the research, which could provide competitors with an information advantage (see Darrough and Stoughton 1990). In this context, share repurchases may be viewed as a credible signal of the managers' high expectation for the company's fundamentals (Vermaelen 1981; Miller and Rock 1985). Consistent with this view, 85.4% of executives surveyed by Brav et al. (2005) said that share repurchase decisions convey information to the market.

The key idea behind the various *signaling* hypotheses of stock buybacks is that sending a false signal via stock buybacks is unlikely because it is costly (Ofer and Thakor 1987; Constantinides and Grundy 1989; Oded 2005; Bhattacharya and Jacobsen 2015). Thus, stock buybacks are a credible signal of undervaluation. In particular, the buyback of overpriced stock incurs trading losses that lower the company's future stock price and the wealth of its long-term shareholders, which often include the managers themselves.

Fixed-price repurchase tender offers appear to be well suited for the role of signaling. A fixed-price RTO commits the company to buying back a specified number of shares at a specified price. Because of these commitments, it is often said that a fixed-price RTO provides a stronger signal of undervaluation than other types of buybacks do (see Comment and Jarrell 1991; Grullon and Ikenberry 2000; Louis and White 2007). The tender price in a typical fixed-price RTO represents a sizable premium above the prevailing market price (Comment and Jarrell).

The high tender price makes a false signal costly to owner/managers, as theory suggests. Louis and White provide additional insights into how companies use fixed-price RTOs by applying the *complementary signals* hypothesis, which posits that managers use discretionary accruals to complement other signals. They examined a sample of 177 RTOs in the United States between 1981 and 2001 and document a positive correlation between the announcement return for a fixed-price RTO and the use of discretionary accruals by

the announcing company in the previous quarter. Moreover, they show that the companies with the highest levels of discretionary accruals experience the largest positive abnormal long-run returns. This evidence is consistent with the idea that managers use discretionary accruals and fixed-price RTOs as complementary signals of undervaluation.

In theory, Dutch auction RTOs feature similar commitments to those in fixed-priced RTOs and may also serve as strong signals of undervaluation. In practice, companies appear to use Dutch auction RTOs for different purposes. In contrast to the high offer price in fixed-price RTOs, Dutch auction RTOs typically have a minimum price that is only slightly above the prevailing market price; a low minimum price helps reduce the final price the company pays for shares but also weakens any signal of undervaluation (Comment and Jarrell 1991). A wide range of offer prices implies that the ultimate tender price largely reflects investors' beliefs. In addition, Louis and White (2007) report that, on average, companies that announce Dutch auction RTOs record significant abnormal negative accruals in the prior quarter. The use of negative accruals is inconsistent with managers signaling undervaluation. Overall, the evidence suggests that companies use Dutch auction RTOs mainly to minimize their share acquisition costs rather than to signal undervaluation (Grullon and Ikenberry 2000; Louis and White 2007).

Relative to signaling with an RTO, signaling with an open-market repurchase is much more complex because the authorization of an OMR gives the company the option, but not the obligation, to buy back shares. Many researchers have argued that OMRs provide a weaker signal of undervaluation than do RTOs because of their lack of commitment to buy (see Comment and Jarrell 1991; Grullon and Ikenberry 2000; Rau and Vermaelen 2002; Chan, Ikenberry, Lee, and Wang 2010). Because the company managers are not obliged to repurchase any shares in an OMR, the cost of false signaling is low. Chan et al. (2010) examined a sample of 7,628 OMRs in the United States between 1980 and 2000 and identified many suspect OMRs announced by managers under abnormal pressure to boost the stock price.<sup>21</sup> They show that in these instances, companies buy back fewer shares and do not outperform their peers in subsequent periods, which is consistent with false signaling.

Many researchers have examined how a company's disclosure environment affects the information content of its OMRs. Brockman, Howe, and Mortal (2008) provide evidence of companies timing the release of news

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<sup>21</sup>These announcements typically come from companies with poor earnings quality, companies with negative analyst revisions, and those with managers who hold a large quantity of vested stock options. They make up less than 10% of the sample analyzed by Chan et al.

around OMR announcements. They found that companies are more likely to announce bad news prior to OMR announcements and more likely to announce good news shortly after. Similarly, Gong, Louis, and Sun (2008) propose that companies that conduct OMRs for purposes other than signaling have an incentive to deflate their stock price in the pre-repurchase period.<sup>22</sup> They document several empirical findings consistent with this hypothesis in a sample of 1,720 OMRs in the United States from 1984 to 2002. They observed abnormal negative accruals in the pre-repurchase period only for companies that actually implemented the buyback in the two quarters following the announcement. They show that the magnitude of the abnormal negative accruals predicts the actual amount of shares subsequently repurchased. Moreover, they document a negative correlation between abnormal accruals in the pre-repurchase period and improvements in company operational performance in the post-repurchase period, which suggests that the often-documented positive long-run abnormal returns following OMRs are driven, in part, by the market upwardly revising an expectation based on deflated pre-repurchase earnings.

Chen and Huang (2013) extended the sample period of Gong et al. (2008) to 2010 and document the same abnormal use of negative accruals in the pre-repurchase period prior to the passage of the Sarbanes–Oxley Act (SOX) in July 2002. They found no evidence, however, of companies using abnormal negative accruals in the pre-repurchase period after the passage of SOX. Using a sample of 6,240 OMRs by US companies from 1998 to 2007, Bonaimé (2015) investigated the effect on payout policies of changes in SEC Rule 10b-18, which mandates additional disclosures for buyback transactions (such as number repurchased and average price paid per share). She reports that companies reduced their likelihood of announcing an OMR by a quarter after the changes to SEC Rule 10b-18. However, the repurchase completion rates were 6.1% higher following the rule change. These findings in the literature indicate that improved disclosure environments reduce the incentives to send false signals and make OMRs a more precise signal of undervaluation.

Peyer and Vermaelen (2009) point out that reputation may also allow companies to signal undervaluation with OMRs despite the lack of an explicit commitment to repurchase. Bonaimé (2012) studied how the lack of commitment affects the signaling value of OMRs by examining a sample of 11,697 OMRs in the United States between 1988 and 2007. She documented a *reputation effect* stemming from consistently completing authorized OMRs; announcement returns were, on average, higher for companies with greater

<sup>22</sup>In most studies, the pre-repurchase period is defined as the quarter before the buyback announcement. See Louis and White (2007) for similar analysis for RTOs.

completion rates for previous OMRs. In addition, Babenko, Tserlukevich, and Vedrashko (2012) show that in a sample of 5,827 OMRs in the United States from 1993 to 2008, the announcement returns were positively related to the amount of net insider buys in the pre-repurchase period, suggesting that insider trades affect the credibility of OMRs as signals of undervaluation (see Bonaimé and Ryngaert 2013 for related evidence). This empirical evidence highlights some of the limitations of using an OMR as a signal of undervaluation.

Some works refine the *signaling* hypothesis to account for the lack of commitment to buy in an OMR. Oded (2005) offers a theory of signaling based on the option value of an OMR, which stems from the company buying back shares only when it receives favorable information about future cash flows. Under the assumption that better companies generate cash flows that are, on average, higher but also more volatile, the option value of an OMR is higher for better companies. Bhattacharya and Jacobsen (2015) posit that OMRs allow companies to correct underpricing by attracting the attention of informed traders. In their model, a company that is not undervalued has no incentive to announce an OMR because its true value would be discovered by informed traders.

Other works have challenged the notion that OMR announcements contain information about company fundamentals. Jagannathan and Stephens's (2003) analysis of 3,520 OMRs in the United States between 1986 and 1996 reveals a negative association between OMR announcements and earnings in subsequent years. Grullon and Michaely (2004), who examined a sample of 4,443 OMRs in the United States between 1980 and 1997, also did not find evidence that OMR-announcing companies generate better operating performance than their peers in the three years following the announcements. In fact, they report that some OMR-announcing companies in their sample underperformed relative to their peers on some metrics, such as sales and cash flow return on assets. Grullon and Michaely provide a nuanced view of signaling with OMRs by positing that an OMR signals a shift from a riskier growth phase to a more stable mature phase in the company's life cycle. They argue that the positive announcement returns for OMRs reflect lower discount rates rather than higher future cash flows. To test this hypothesis, they estimated the Fama and French (1993) factor loadings of companies in their sample before and after OMRs. They report that, on average, the market and SMB betas declined by, respectively, 0.14 and 0.15; the magnitudes are both economically and statistically significant. Moreover, the reduction in risk was stronger for companies with larger programs.

Overall, the evidence suggests a hierarchy of buyback types for the purpose of signaling undervaluation: fixed-price RTOs, Dutch auction RTOs, and then OMRs. For example, Comment and Jarrell (1991) found that the average announcement returns for a large sample of fixed-price RTOs, Dutch auction RTOs, and OMRs between 1984 and 1989 were, respectively, 11.9%, 7.7%, and 2.3% (see Louis and White 2007 for similar findings for RTOs and Singh, Zaman, and Krishnamurti 1994; Ikenberry et al. 1995; Grullon and Michaely 2004; and Babenko et al. 2012 for OMRs). Given that other types of buybacks appear to serve as much stronger signals of undervaluation than OMRs do, the overwhelming popularity of OMRs probably cannot be explained by signaling alone.

## Stock Liquidity

Closely related to the signaling role of stock buybacks is their impact on stock liquidity. The premise of all *signaling* theories of buybacks is that the managers have information about the company's fundamental value that the market does not. As a result, buybacks of all types may indirectly affect stock liquidity. For instance, the information conveyed by a stock buyback may reduce the perceived riskiness of a company (Grullon and Michaely 2004). This section focuses on the direct impact of OMRs on stock liquidity as a result of the execution of OMRs in the open market.<sup>23</sup>

In an OMR, investors do not learn about a company's actual repurchases until they have been made. In the United States, companies disclose their actual OMR activity only at the end of the quarter.<sup>24</sup> Similar delays are common in other jurisdictions. Barclay and Smith (1988) were the first to note that an OMR may increase trading costs associated with adverse selection because of the buy orders of a manager who is better informed than the market is. They examined a sample of 244 OMRs in the United States from 1970 to 1978 and report that companies experienced an increase in their bid-ask spreads in the years in which they announced an OMR. The authors interpret their findings as evidence of OMRs having a negative effect on stock liquidity. Using a more recent sample of OMRs in the United States (2004–2009), Ben-Rephael et al. (2014) also provide evidence suggesting that buybacks consume liquidity.

Several other studies, however, did not find consistent evidence of such a negative effect (Singh et al. 1994; Wiggins 1994). Some studies even document a positive effect of OMRs on stock liquidity. Under the *competing market*

<sup>23</sup>See the section "Takeover Deterrence" in this chapter for a discussion of stock liquidity and the role of buybacks in takeover deterrence.

<sup>24</sup>See the SEC rules at [www.sec.gov/rules/final/33-8335.htm](http://www.sec.gov/rules/final/33-8335.htm).

*maker* hypothesis, repurchasing companies compete against market makers and lower trading costs. Cook et al. (2004) analyzed the detailed repurchase trading data from 64 US companies from 1993 and 1994 and found evidence consistent with the *competing market maker* hypothesis;<sup>25</sup> the bid–ask spread was significantly lower on repurchase days than on adjacent nonrepurchase days and days in the pre-repurchase period. They also document similar evidence for other measures of liquidity, such as price impact.

The international evidence on the impact of OMRs on stock liquidity is similarly ambiguous. Some authors have documented a negative effect. For instance, Brockman and Chung (2001) exploited the unique disclosure environment of the Stock Exchange of Hong Kong, which mandates the daily reporting of repurchase trading activity, to study the information content of buybacks and their impact on stock liquidity. They found that the bid–ask spread widens during repurchase days, which is consistent with an increase in adverse selection costs as a result of informed managerial trading (see Ginglinger and Hamon 2007 for similar evidence for OMRs in France). Other researchers have documented a positive effect. For example, De Cesari, Espenlaub, and Khurshed (2011) investigated a sample of 386 Italian companies from 1997 to 2004 and found that OMRs had a positive effect on liquidity, as measured by the bid–ask spread, and price discovery, as measured by return variance (see Chung, Isakov, and Perignon 2007 and McNally and Smith 2011 for similar evidence for OMRs in, respectively, Switzerland and Canada).

The liquidity of a company's stock and its repurchasing decision are probably closely related. For example, half of the executives surveyed by Brav et al. (2005) said that the liquidity of their stock was an important factor driving repurchase decisions. Brockman, Khurana, and Martin (2008) examined a broad sample of US companies from 1983 to 2006 and found that OMR-initiating companies have significantly more liquid stock than noninitiating companies in the pre-repurchase period, which suggests that stock liquidity drives repurchase decisions. In addition to such concerns of reverse causality, Hillert, Maug, and Obernberger (2016) point out that the evidence of the impact of OMRs on stock liquidity is inconclusive because of differences in methodology as well as differences in trading environments across markets and across time. They propose an instrumental approach to establish causality.<sup>26</sup> They investigated 6,537 OMRs in the United States from 2004 to

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<sup>25</sup>Their analysis is based on the voluntary responses of 64 companies out of 414 requests sent.

<sup>26</sup>Their instruments were the median monthly trading volume of all companies and the absolute difference between the company's stock price and \$30.

2010 and document evidence that OMRs improve liquidity, as quantified by the bid–ask spread, price impact, and the Amihud (2002) liquidity measure.

Overall, the evidence on the relationship between OMRs and stock liquidity is inconclusive. The nature of the relationship appears to differ by time period, jurisdiction, and type of company studied.

## Excess Cash and Financial Flexibility

Companies sometimes find themselves with more money than available investment opportunities. For example, while the economy is recovering from the recent COVID-19 crisis, many US companies have plenty of cash but lack investment opportunities or other inputs needed for new projects. Mike Zechmeister, the chief financial officer of logistics provider C.H. Robinson, says that the company repurchased \$286 million of its shares in the first half of 2021. He noted, “We are merely constrained by the lack of [noncash] resources,” and he viewed the funds used to repurchase shares as “leftover money.”<sup>27</sup> Consistent with this anecdotal evidence, 80% of executives surveyed by Brav et al. (2005) agreed that the availability of good investment opportunities is an important consideration affecting the decision to buy back shares, and 60% of executives agreed that the decision to repurchase shares relates to their company “having extra cash or liquid assets, relative to [their] desired cash holdings.”

Agency theory suggests that managers of a company with excess cash may be tempted to spend the money on pet projects with negative net present values (NPVs). Academic researchers point to corporate payouts as a partial solution to this agency problem because payouts limit the managers’ access to excess cash (Jensen 1986). Based on this agency problem, the *free cash* hypothesis of share repurchases posits that companies buy back stock when they have excess cash. Indeed, many researchers have found empirical support for this hypothesis (for example, Barth and Kasznik 1999; Dittmar 2000; Guay and Harford 2000; Grullon and Michaely 2004; Harford, Mansib, and Maxwell 2008; Lee and Suh 2011). Grullon and Michaely (2004) point out that share repurchases and other payout methods become increasingly important as a company moves from a growth phase (characterized by many positive-NPV projects, high capital expenditures, little free cash flow, and high earnings growth) to a more mature phase (characterized by lower capital expenditures and more free cash flow). Analyzing a sample of 4,443 OMRs in the United States from 1980 to 1997, Grullon and Michaely found that repurchasing

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<sup>27</sup>See Nina Trentmann and Mark Maurer, “Stock Buybacks Beat Capital Spending for Many Big Companies,” *Wall Street Journal* (14 September 2021). Available at [www.wsj.com/articles/stock-buybacks-beat-capital-spending-for-many-big-companies-11631611802](https://www.wsj.com/articles/stock-buybacks-beat-capital-spending-for-many-big-companies-11631611802).

companies experienced declines in their level of cash reserves, capital expenditures, and research and development (R&D) expenses. Moreover, they document that companies that were more likely to overinvest experienced higher positive abnormal returns after repurchasing. Their evidence suggests that some buybacks are associated with restructuring as companies advance through the corporate life cycle (see Nohel and Tarhan 1998 for similar evidence based on RTOs).

Note that share repurchases reduce a company's cash holdings, which mechanically makes the company more levered.<sup>28</sup> The reduction in a company's cash holdings lowers its debtholders' claims in bankruptcy. Most academic research has not found, however, that stock buybacks reduce debtholder wealth. Dann (1981) examined a sample of 300 RTOs in the United States from 1962 to 1976 and reports positive announcement returns for equity and convertible debt. Contrary to the *wealth transfer* hypothesis, he did not find announcement returns that were statistically different from zero for straight debt and preferred stock (see Jun, Jung, and Walkling 2009 and Alderson, Halford, and Sibilkov 2020 for similar evidence for OMRs). Dann posits that a stock buyback signals favorable information about company fundamentals, which increases the value of both equity and debt; the positive effects from signaling offset the negative effects of potential wealth transfers. Jun et al. (2009) investigated this hypothesis further for a sample of 366 OMRs in the United States from 1991 to 2002. They show that in a subsample of stock buybacks that were probably used to fund employee stock options, rather than to signal undervaluation, share repurchases had a negative wealth effect on debtholders. The evidence suggests that the stock buybacks can have both positive and negative effects on debtholder wealth.

Both paying dividends and repurchasing shares reduce excess cash, but executives view stock buybacks as the most flexible way of distributing funds to shareholders because reductions in buybacks are not viewed as negatively by the market as reductions in dividends are (Brav et al. 2005). In fact, many executives interviewed by Brav et al. pointed out that this flexibility is one of the main advantages of repurchasing shares over paying dividends.

Academic studies also highlight the financial flexibility associated with stock buybacks. Guay and Harford (2000) posit that companies use OMRs to distribute cash flows resulting from positive transitory shocks and use dividend increases to distribute cash flows resulting from more permanent

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<sup>28</sup>Many academic studies highlight companies' use of stock buybacks to adjust their capital structure toward their targets. For examples, see Hovakimian, Opler, and Titman (2001) and Dittmar (2000).

shocks.<sup>29</sup> Consistent with this hypothesis, they show that in their sample of 1,068 OMRs and 5,007 dividend increases by US companies from 1981 to 1993, the future cash flows of the median dividend-increasing company were above the preshock level whereas the future cash flows of the median repurchasing company experienced a significant decline relative to preshock levels (see also Jagannathan et al. 2000). Overall, the evidence supports the idea that companies use share repurchases to reduce excess cash flows that may not be sustained.

The added flexibility from using stock buybacks as a payout policy may also affect how companies approach risk management. Bonaimé, Hankins, and Harford (2013) investigated the relationship between *payout flexibility*, defined as the ratio of repurchases to total payout, and financial hedging. They used a sample of US bank holding companies from 1995 to 2008 because those companies are required to report the details of their financial hedging activities. They document a strong negative relationship between payout flexibility and financial hedging, which suggests that a company's risk management and payout policy are determined jointly.<sup>30</sup>

Finally, the share repurchase itself may affect a company's financial flexibility. Chen and Wang (2012) posit that the reduction in corporate liquidity following buybacks lowers the performance of financially constrained firms because of the increased difficulty they have financing necessary investments. They analyzed a sample of 4,710 OMRs in the United States from 1990 to 2007 and found that the financially constrained companies experienced a significant decline in cash holdings, cash flow, and investments as well as a significant increase in leverage after the announcement of an OMR.<sup>31</sup> Moreover, the announcement returns and long-run abnormal returns were both lower for financially constrained companies that announced OMRs than for companies that did not. This finding suggests that the market anticipates the negative effects of OMRs on corporate liquidity for financially constrained companies. Financially constrained companies also produced significantly poorer operating performance after the repurchases than did the unconstrained companies.

Overall, the evidence indicates that access to excess cash is a main driver of the level of share repurchases. This finding is robust to the international

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<sup>29</sup>A "cash flow shock" was defined as the average cash flow around the year of the announcement minus the average cash flow in the preceding three years.

<sup>30</sup>They also provide qualitatively similar results for a sample of nonfinancial companies from the Compustat database.

<sup>31</sup>To proxy for financial constraints, they used the KZ Index of Kaplan and Zingales (1997), the cash-cash flow sensitivity measure of Almeida, Campello, and Weisbach (2004), the September investment-cash flow sensitivity measure of Fazzari, Hubbard, and Petersen (1988), and the WW Index of Whited and Wu (2006).

setting. Moreover, the additional financial flexibility conferred by stock buybacks over other payout methods may make them especially attractive for companies with transitory cash flows or companies that find it difficult to hedge in other ways.

## **Employee Incentives**

Managerial incentives may influence a company's payout policy and its decision to repurchase shares. Agency theory prescribes managerial compensation policies that tie the managers' welfare to shareholder wealth (Jensen and Murphy 1990). Performance-linked compensation, such as restricted stock grants and stock options, became increasingly popular in the 1980s and 1990s (Hall and Liebman 1998; Kahle 2002). Many researchers have examined how such equity-based pay may influence payout policy. Equity-based pay makes managers part owners of the company. Therefore, the tax preferences of corporate managers and directors may influence the company's payout policy. If managers face higher taxes when receiving cash from dividends relative to receiving cash from stock sales, they have an incentive for the company to repurchase shares rather than pay dividends. Indeed, several studies have analyzed the effect of managerial tax preferences on payout policy and found that the companies with higher executive stock ownership are more likely to distribute cash via share repurchases; this effect is stronger when dividends are more tax disadvantaged relative to stock buybacks (for examples, see Brown, Liang, and Weisbenner 2007 and Moser 2007).

The structure of managerial compensation contracts also seems to have an effect on payout policy. Many managerial compensation contracts feature stock option grants, which are not "dividend protected." In this case, a dividend payment lowers the ex-dividend stock price, which reduces the value of the stock option. Such managerial compensation contracts may make managers favor buybacks over dividends. Researchers analyzing this topic have found that managers without dividend protection for the stock options in their compensation contracts are more likely to have their companies repurchase shares than to pay dividends (Lambert, Lanen, and Larcker 1989; Fenn and Liang 2001; Kahle 2002; Cuny, Martin, and Puthenpurackal 2009; Burns, McTier, and Minnick 2015). Despite these findings, only 10.6% of executives surveyed by Brav et al. (2005) indicated that they buy back shares rather than pay dividends because of the lack of dividend protection for employee stock options.

A common feature of managerial compensation contracts is performance-based pay based on accounting measures. One common measure of CEO

performance is the company's earnings per share (EPS).<sup>32</sup> Cheng, Harford, and Zhang (2015) investigated the relationship between executive compensation structure and share repurchases in a sample of 1,423 companies in the United States from 1993 to 2007. They report that companies that paid their CEOs bonuses based on EPS targets were more likely to repurchase than were other companies; this effect was strongest for companies with EPS figures just below the bonus threshold. The dilutive EPS measure is also often used by financial analysts and investors to estimate a company's value and performance (Jennings, LeClere, and Thompson 1997). The EPS measure is calculated by dividing the company's earnings by weighted-average common shares outstanding. It accounts for dilutive securities by adjusting the denominator with outstanding dilutive securities, such as employee stock options. Thus, employee stock options outstanding increase the number of shares over which the company's earnings are divided, mechanically lowering the dilutive EPS measure. Hence, managers who are evaluated by dilutive EPS have an incentive to counter this effect by buying back shares. Many researchers provide evidence consistent with this motive by showing that the companies with more employee stock options outstanding are more likely to repurchase shares (Kahle 2002; Bens, Nagar, Skinner, and Wong 2003; Cuny et al. 2009; for evidence in the EU, see Burns et al. 2015).

There is also evidence of a relationship between buybacks and an incentive provision for nonexecutive employees. Kahle (2002) examined 712 OMRs in the United States from 1992 to 1996 and reports that companies are more likely to announce an OMR when their employees have many exercisable stock options.<sup>33</sup> The completion rates of OMRs are also positively correlated with exercisable stock options. Babenko (2009) offers a theory of buybacks based on the provision of employee incentives. Because employees cannot trade unvested shares, stock buybacks increase the fraction of the company held by employees, effectively increasing their pay-to-performance sensitivity. She argues that this incentive provision helps explain a portion of the positive announcement returns to OMRs. She documents evidence consistent with this hypothesis in a sample of 1,295 OMRs in the United States between 1996 and 2002; the announcement returns of OMRs were found to be positively correlated with both the size of the repurchase program and outstanding employee stock options.

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<sup>32</sup>Cheng, Harford, and Zhang (2015) constructed a large database of CEO compensation bonus structures by using the companies' annual proxy statements (SEC Form DEF 14A) and report that 49% of CEOs in their sample had bonuses tied to EPS targets.

<sup>33</sup>Specifically, Kahle (2002) used the metric "total exercisable options as a percentage of total shares outstanding."

Overall, the literature documents compelling evidence of a connection between, on the one hand, how a company compensates its managers and its nonexecutive employees and, on the other hand, its decision to repurchase shares.

## **Takeover Deterrence**

Share repurchases may be used to counter a takeover threat or satisfy “greenmail.” Greenmail involves a company raider acquiring a large stake in the target company from the open market and making a takeover threat. The raider offers a “standstill agreement” in which it promises to abandon the takeover attempt if the target company pays a ransom by buying back those shares at a premium. A privately negotiated repurchase allows for a transfer of wealth to a specific investor, making it an attractive method for satisfying greenmail demands. The management may be willing to pay a significant premium relative to the current market price in order to retain some private benefits of control (Peyer and Vermaelen 2005).

The business tactic of greenmail became prominent in the 1980s. Some examples of greenmail transactions are Sir James Goldsmith’s greenmail of Goodyear Tire & Rubber Company in 1986, Carl Icahn’s greenmail of Viacom International in 1986, and Saul Steinberg’s greenmail of Walt Disney Company in 1984. Early works studying privately negotiated repurchases in the 1970s and early 1980s document a negative market reaction to the announcement of PNRs, which is consistent with the prevalence of greenmail events in this time period (for example, see Mikkelsen and Ruback 1991). In response to the wave of greenmail transactions in the 1980s, several US states adopted anti-greenmail laws prohibiting companies from repurchasing shares at a premium relative to the market price unless approved by a majority of shareholders.

Evidence suggests that additional regulatory scrutiny and improved governance reduce the use of buybacks in greenmail events. Peyer and Vermaelen (2005) analyzed a sample of 737 PNRs between 1984 and 2000 and report a positive market reaction to the announcement of these buybacks, in stark contrast to earlier results. They point out that the negative market reaction documented by earlier works is concentrated in a subsample of 60 greenmail events identified by the Securities Data Company (SDC) as repurchases from hostile parties. Moreover, they note that compared with the 1970s and the early 1980s, PNR programs no longer repurchase at a significant premium above the market price; in fact, 45% of the PNRs in their sample involved discounts. Harris and Glegg (2009) examined 125 PNRs from 1994 to 2007 and found that companies with weak shareholder protection, proxied

by governance measures from the Investor Responsibility Research Center, repurchased at a higher premium. In addition, they show that the positive long-run abnormal returns documented by Peyer and Vermaelen (2005) hold only for companies with strong shareholder protections. These findings suggest that improved governance mitigates agency problems associated with greenmail and buybacks.

Rather than giving in to greenmail, the managers may use share repurchases to fend off a takeover. For example, Australian brewer Foster's Group announced a share repurchase program to defend against a hostile takeover by its rival SABMiller in 2011.<sup>34</sup> Researchers suggest several possible mechanisms that rationalize this practice. Bagnoli, Gordon, and Lipman (1989) argue that a company uses share repurchases to signal that the value of the stock is high, which convinces shareholders not to sell shares to the raider at a low price (see also Sinha 1991).<sup>35</sup> Bagwell (1991) points out that a stock buyback skews the distribution of shareholders toward those that place a high value on the company because shareholders that place little value on the company sell their shares back to the company. Thus, buybacks make it more costly for a corporate raider to acquire the shares needed for a successful takeover. Billett and Xue (2007) examined a broad sample of US companies from 1985 to 1996 and, consistent with the *takeover defense* hypothesis, report a positive significant association between takeover probability and OMRs (see Hodrick 1999 for evidence related to repurchase tender offers).

Overall, the research on the use of stock buybacks as a takeover deterrence highlights some potential agency problems in the use of stock buybacks. However, these findings also illustrate how proper governance can mitigate these agency problems.

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<sup>34</sup>See Julia Werdigier, "Fosters Moves to Thwart SABMiller's Hostile Bid," *New York Times* (23 August 2011). <https://dealbook.nytimes.com/2011/08/23/fosters-moves-to-thwart-sabmillers-hostile-bid/>.

<sup>35</sup>See the "Signaling" section for more discussion of buybacks as a signaling tool.

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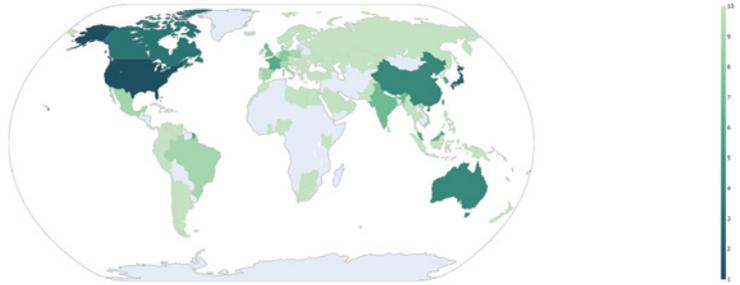
## 5. Data in Share Buyback Research

Firms disclose information about their share repurchase programs in corporate filings, trade publications, wires, and news reports. This information is then collected by data service providers, such as the Securities Data Company and S&P Capital IQ.

Banyi, Dyl, and Kahle (2008) point out that early studies on share buybacks identified announcements of share repurchases by using news sources, such as the *Wall Street Journal*, whereas more recent studies have relied on professional data vendors, such as the SDC. **Figure 2** shows coverage by the SDC database over the period 1998–2020. The SDC database has a global coverage with records on share repurchase activity from over 100 different markets. The top three markets with the largest number of announced repurchase programs are the United States (17,653 programs), Japan (2,702 programs), and Canada (1,508 programs). The majority of share repurchase programs in the SDC database are in the United States. Most markets had fewer than 100 repurchase programs in this time period. Thus, the focus of academic research on share repurchases in the United States may be driven, in part, by data availability.

In the United States, open-market share repurchases are regulated by the SEC under the Securities Exchange Act. The announcement of an OMR program is one of the provisions of the SEC's safe harbor rule. Jagannathan et al. (2000) argue that announcing a share repurchase program is a dominant strategy for a company because doing so is essentially costless.

In December 2003, the SEC amended Rule 10b-18 to make it mandatory for US-listed companies to report information about their repurchase activity in their quarterly and annual filings. Since that amendment, information about a company's repurchase program has been directly accessible from its 10-Q, 10-K, and 20-F filings via the SEC's EDGAR database. Under this amendment, companies must include a table in their quarterly filings disclosing information on total number of shares repurchased (monthly repurchase volume), the average price paid per share (monthly repurchase price), the total number of shares repurchased as part of publicly announced repurchase programs, and the maximum number (or approximate dollar value) of shares that may still be purchased under existing repurchase programs. Moreover, in the footnotes to the table, companies must provide information on repurchase programs that expired or were suspended over the reporting period. Finally, the amendment requires additional footnotes disclosing the number of shares

**Figure 2. Map of SDC Database Coverage, 1998–2020**

*Notes:* Repurchase activity by market. Multiple announcements of share repurchase programs by a company in a given year were counted as one program. Markets are classified into 10 groups by the total number of announced repurchase programs. Group 1 (Group 10) includes markets that have the largest (smallest) numbers of announced repurchase programs; in the map, they are a dark navy color (light green color). Markets with no repurchase programs in the database over the period are in grey.

*Sources:* The SDC. The map was generated using a choropleth world map in the package *plotly*.<sup>36</sup>

repurchased outside publicly announced programs and the nature of those repurchase transactions.

Prior to 2004, companies were not required to report their actual share repurchase activity, which meant that a company's buyback activities could not be directly measured. Researchers relied on various CRSP-based or Compustat-based proxies for number of shares repurchased. The four most common measures of the number of shares repurchased were (1) monthly decreases in shares outstanding from CRSP, (2) annual and quarterly decreases in shares outstanding from Compustat, (3) purchases of common stock, and (4) increases in the dollar value and number of shares of the company's treasury stock. Although these measures used US financial data, they may have been adapted for share repurchase studies in the international context.

The first measure is *the decrease (if any) of shares outstanding reported in the monthly CRSP database*. Usually this measure is adjusted for other activities that may mechanically affect the number of shares outstanding, such as stock splits. Stephens and Weisbach (1998) point out that this measure may underestimate the actual number of shares repurchased. Many company activities, such as the distribution of shares to benefit plans, the exercise of

<sup>36</sup>C. Sievert, *Interactive Web-Based Data Visualization with R, plotly, and shiny*, 1st ed. (Boca Raton, FL: Chapman and Hall/CRC, 2020).

executive stock options, and secondary issuance, may increase the number of shares outstanding. In fact, Kahle (2002) provides evidence that companies buy back shares to fund employee stock option exercises. The netting effect of share repurchases and distributions in the same month biases the estimate downward.

The second measure is *the decrease (if any) in shares outstanding reported by Compustat*. To construct this measure, researchers use data on the number of shares outstanding either at the quarterly or annual frequency from the Compustat databases. By construction, the measure is similar to the CRSP-based measure and is subject to the issues discussed above. The bias may be more severe because the netting effect of repurchases and distributions is more significant over a longer period of time (quarter or year versus month).

The third measure is *purchase of common stocks reported by Compustat*. The estimate of the actual number of repurchased shares is calculated as the ratio of the net dollars spent on repurchases or retirements of the company's own securities to the repurchase price. Because the repurchase price is not observable, researchers have to make assumptions about it. The most common assumption is that the company repurchases shares either at the lowest price or at the average monthly closing price in the quarter. Stephens and Weisbach (1998) point out that "the lowest price assumption" is likely to overestimate the number of shares repurchased because it is unlikely that managers are able to execute all share repurchases at the lowest possible price either by trading in the market or via privately negotiated transactions.

The fourth measure uses information about the company's *treasury stock*. Stephens and Weisbach (1998) estimated the actual number of repurchased shares as the ratio of the change in the *dollar value of treasury stock reported in the quarterly Compustat database* to the repurchase price. Similar to the previous measure, this estimate relies on some assumptions about the repurchase price. This measure may incorporate several potential sources of bias. It is prone to all the measurement issues previously discussed (because of the assumption as to repurchase price or netting of simultaneous repurchases and distributions). This measure will be biased upward if companies accept shares as payment for the exercise of employee stock options in lieu of cash. Banyai et al. (2008) also point out that some companies may be prohibited from maintaining treasury stock accounts by corporate state law and report repurchases as retirements to the common stock accounts. Therefore, procedures relying on the treasury stock measure may erroneously estimate zero share repurchases. In such cases, Fama and French (2001) estimated the actual number of repurchased shares as the maximum of zero and the difference between the purchases and sales of common and preferred stock. Using

hand-collected data on mandatory disclosure of actual share repurchases in 10-Q and 10-K filings for 2004, Banyi et al. (2008) found that the estimates suffered severe measurement errors that are amplified for companies with significant employee stock option activity. Out of the four estimates, the Compustat-based measure was the most accurate. Nevertheless, Compustat-based quarterly estimates misstated the actual number of repurchased shares by at least 10% in 34% of the cases; the Compustat-based annual estimates misstated the actual number of repurchased shares by at least 10% in 48% of the cases.

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## 6. Conclusion

In this review, we aimed to present the main findings from the academic literature on stock buybacks in the United States and in other markets. Where appropriate and possible, we compared and contrasted the insights of researchers to the views of practitioners. We have made every effort to present a balanced synthesis of nearly 100 studies. Nevertheless, we recognize that we may have missed some works and that our presentation of the selected works inevitably reflects some of our views.

As we have emphasized throughout the literature review, share repurchases have many facets. Academic research provides support for many of the motivations for buybacks noted by practitioners, such as providing liquidity and price support, returning excess cash while maintaining financial flexibility, correcting undervaluation, and conveying information to the market. These aspects of buybacks are often cited by proponents of share repurchases.

At the same time, academic research has highlighted the potential for the misuse of stock buybacks, such as for satisfying greenmail, manipulating executive compensation, and misleading investors. This aspect of share repurchases is rarely mentioned by corporate executives and lends some credence to concerns expressed by opponents of stock buybacks.

Hundreds of billions of dollars flow from public companies to their shareholders via share repurchases every year. As pointed out by academic researchers, although stock buybacks may be misused in some instances, they have clear advantages. Hence, the challenge is to provide the right combination of oversight that allows companies to benefit from those advantages while minimizing potential costs.

Finally, a recurring theme of the studies surveyed in this review is that a company's decision to repurchase shares is tightly linked to many of its other policies, such as capital structure, compensation, risk management, and disclosure. Hence, decision makers (e.g., regulators and corporate boards seeking to influence how a company conducts buybacks) should also consider how their proposals would affect the company's other policies.

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## Annotated Bibliography

Akhigbe, A., and J. Madura. 1999. “Intraindustry Effects of Bank Stock Repurchases.” *Journal of Financial Services Research* 15 (1): 23–36. <https://doi.org/10.1023/A:1008082202141>

The authors analyzed the intra-industry effects of open-market repurchase programs in the banking sector. The sample consists of 77 OMRs by banks in the United States from 1978 to 1995. Repurchase information is from the *Wall Street Journal*. Data on bank characteristics came from Compustat. The authors found that the announcement of an OMR program increases the stock price of the announcing bank as well as those of its competitors. These results suggest that buyback programs in the banking sector contain much information about the overall profitability of the industry.

Alderson, M. J., J. T. Halford, and V. Sibilkov. 2020. “An Examination of the Wealth Effects of Share Repurchases on Bondholders.” *Journal of Corporate Finance* 65 (December). <https://doi.org/10.1016/j.jcorpfin.2019.101499>

This paper addresses the wealth effects of stock buybacks on bondholders by using a sample of 1,117 OMRs in the United States by firms with publicly traded debt. Data sources include the Trade Reporting and Compliance Engine, CRSP, Compustat, and the SDC. It documents that a company’s bonds do not experience a return in a three-day window around its announcement of a stock buyback that is statistically different from zero. These findings do not support the hypothesis that, overall, stock buybacks transfer wealth from bondholders to equityholders.

Almeida, H., M. Campello, and M. S. Weisbach. 2004. “The Cash Flow Sensitivity of Cash.” *Journal of Finance* 59 (4): 1777–804. <https://doi.org/10.1111/j.1540-6261.2004.00679.x>

The authors propose a theoretically motivated measure of a firm’s financial constraints—the sensitivity of cash holdings to cash flows. It measures how much of the firm’s current cash flow the firm saves. The measure is close to zero for financially unconstrained firms but positive and highly significantly different from zero for the constrained ones.

Amihud, Y. 2002. “Illiquidity and Stock Returns: Cross-Section and Time-Series Effects.” *Journal of Financial Markets* 5 (1): 31–56. [https://doi.org/10.1016/S1386-4181\(01\)00024-6](https://doi.org/10.1016/S1386-4181(01)00024-6)

This paper introduces an illiquidity measure, called “ILLIQ” or the “Amihud illiquidity measure,” that is calculated as the daily ratio of absolute stock returns to their dollar volume, averaged over some period. The measure proxies the linear market impact. The paper establishes that expected stock excess return reflects compensation for expected market illiquidity.

Andriosopoulos, D., K. Andriosopoulos, and H. Hoque. 2013. “Information Disclosure, CEO Overconfidence, and Share Buyback Completion Rates.” *Journal of Banking & Finance* 37 (12): 5486–99. <https://doi.org/10.1016/j.jbankfin.2013.04.011>

The authors exploited the unique disclosure requirement of open-market repurchases in the United Kingdom to investigate how information disclosure and CEO overconfidence affect repurchase activity. Using a sample of 400 open-market repurchase programs in the United Kingdom from 1997 to 2006, they show that both greater information disclosure and more CEO overconfidence are associated with higher repurchase completion rates. The authors proxied for greater information disclosure by the additional information volunteered by the firm in the repurchase announcement. A CEO’s overconfidence is proxied mainly by the CEO’s holding of vested in-the-money stock options in the firm. Other proxies for overconfidence, such as age and gender, were also used. Data sources include Perfect Analysis, Factiva, Datastream, Worldscope, Zephyr, and Thomson One Banker.

Babenko, I. 2009. “Share Repurchases and Pay–Performance Sensitivity of Employee Compensation Contracts.” *Journal of Finance* 64 (1): 117–50. <https://doi.org/10.1111/j.1540-6261.2008.01430.x>

This paper provides empirical evidence of an incentive provision effect of stock buybacks. The author used data on US share repurchase programs from the SDC for the 1996–2002 period; firms’ characteristics are from Compustat, and stock return data are from CRSP. The author found that after buybacks, the unvested shares in employee compensation packages represent a larger fraction of the firm, which increases the pay-to-performance sensitivity of employees with equity-based pay. Firms are more likely to announce buyback programs when employees have many unvested shares. The market also reacts more favorably to buyback announcements by firms with more unvested employee stock options.

Babenko, I., Y. Tserlukevich, and A. Vedrashko. 2012. “The Credibility of Open Market Share Repurchase Signaling.” *Journal of Financial*

*and Quantitative Analysis* 47 (5): 1059–88. <https://doi.org/10.1017/S0022109012000312>

The authors investigated the credibility of open-market share repurchase authorizations. Data on US share repurchase programs are from the SDC for the 1993–2008 period; other data are from Thomson Financial, CRSP, Compustat, and RiskMetrics, as well as hand-collected information from LexisNexis. The authors found that buyback programs that are preceded by insider buys have higher announcement returns, are more likely to be completed, and are associated with higher subsequent stock returns.

Bagnoli, M., R. Gordon, and B. Lipman. 1989. “Stock Repurchase as a Takeover Defense.” *Review of Financial Studies* 2 (3): 423–43. <https://doi.org/10.1093/rfs/2.3.423>

In this paper, the authors develop a theory of stock buybacks as a takeover defense. They hypothesize that manager/owners have private information about the value of the firms under their management. Their stake in the firms allows manager/owners to credibly signal undervaluation to outside shareholders via a stock buyback because the repurchase of overvalued shares decreases the value of their holdings. Manager/owners also, however, care about retaining their positions, which give them access to private benefits. In some instances, they are willing to implement value-destroying buybacks in order to deter takeovers and keep the private benefits stemming from managing the firm. As a result, the theory predicts that some efficiency-improving takeovers do not occur because they are blocked by takeover defenses via stock buybacks.

Bagwell, L. 1991. “Share Repurchase and Takeover Deterrence.” *Rand Journal of Economics* 22 (1): 72–88. <https://doi.org/10.2307/2601008>

Bagwell develops a theory of share repurchase as a takeover deterrent. She derives the conditions under which tender repurchases deter takeovers. When the supply curve for shares is upward sloping, a tender share repurchase skews the distribution of the remaining shareholders toward those who value the firm more. This effect increases the cost of a takeover bid.

Bagwell, L., and J. Shoven. 1989. “Cash Distributions to Shareholders.” *Journal of Economic Perspectives* 3 (3): 129–40. <https://doi.org/10.1257/jep.3.3.129>

The authors analyzed historical trends in alternative payout policies—dividend payouts, share repurchases, and acquisitions—from 1977 to 1987. They discuss theories that may explain the documented patterns and point

out that theoretical models should be generalized to alternative distribution methods.

Banyi, M. L., E. A. Dyl, and K. M. Kahle. 2008. "Errors in Estimating Share Repurchases." *Journal of Corporate Finance* 14 (4): 460–74. <https://doi.org/10.1016/j.jcorpfin.2008.06.004>

This paper provides a summary of various procedures to estimate company share repurchases and discusses limitations of the most commonly used repurchase data sources. Using Compustat and CRSP data on firms' repurchase programs reported in the SEC Form 10-Q and 10-K filings, the authors examined the accuracy of different repurchase measures. The authors found that both annual and quarterly Compustat repurchases of common stock are accurate measures of actual repurchases that are not affected by redemption of options or simultaneous issuances and repurchases. Table 2 of the paper provides a review of the share repurchase data sources that are commonly used in academic research.

Barclay, M. J., and C. W. Smith. 1988. "Corporate Payout Policy: Cash Dividends versus Open-Market Repurchases." *Journal of Financial Economics* 22 (1): 61–82. [https://doi.org/10.1016/0304-405X\(88\)90022-0](https://doi.org/10.1016/0304-405X(88)90022-0)

The authors examined the impact of open-market repurchase programs on stock liquidity. The sample consists of 244 OMRs in the United States from 1970 to 1978. Repurchase information is from the *Wall Street Journal*. Bid–ask spreads are from Fitch's Stock Quotations on the NYSE. The authors posit that the execution of OMR programs by the better-informed managers would induce an adverse selection problem that would lower the liquidity of the stock. Consistent with this hypothesis, the authors report that the bid–ask spread widens around repurchase announcements.

Bargeron, L., M. Kulchania, and S. Thomas. 2011. "Accelerated Share Repurchases." *Journal of Financial Economics* 101 (1): 69–89. <https://doi.org/10.1016/j.jfineco.2011.02.004>

The authors investigated the use of accelerated share repurchases as a commitment device to buy back shares. The sample consists of US firms from 1997 to 2007. Data on ASRs are from EDGAR filings and Factiva searches. Other data sources include Compustat and CRSP. The authors posit that ASR buyback programs allow managers to quickly and credibly return excess cash to shareholders, signal undervaluation, adjust the firm's capital structure, and defend against hostile takeovers. The authors provide several empirical findings consistent with this hypothesis. The market

reacts positively to the announcement of an ASR. Firms that have fewer investment opportunities, that are below their target leverage ratios, or that have been the targets of unsolicited merger offers are more likely to use ASRs.

Barth, M. E., and R. Kasznik. 1999. "Share Repurchases and Intangible Assets." *Journal of Accounting and Economics* 28 (2): 211–41. [https://doi.org/10.1016/S0165-4101\(99\)00020-8](https://doi.org/10.1016/S0165-4101(99)00020-8)

This paper reports a study of the relationship between intangible assets and share repurchases. The authors used data on US share repurchase programs from the SDC database covering the 1990–94 period and data from Compustat. The authors found that more intangible assets, perhaps proxying for increased information asymmetry, increase the likelihood of share repurchase authorizations. They also found that firms with excess cash are more likely to repurchase shares.

Ben-Rephael, A., J. Oded, and A. Wohl. 2014. "Do Firms Buy Their Stock at Bargain Prices? Evidence from Actual Stock Repurchase Disclosures." *Review of Finance* 18 (4): 1299–340. <https://doi.org/10.1093/rof/rft028>

The authors examined the detailed monthly repurchase execution data of a large sample of OMRs in the United States from 2004 to 2009. The data sources are Compustat, I/B/E/S, CRSP, and firms' financial filings. The authors found that firms executed open-market repurchases at a significant discount to the average market price during the repurchase period. Moreover, actual repurchase activities were followed by significant positive abnormal returns. The evidence suggests that the execution of OMRs contains information.

Bens, D., V. Nagar, D. Skinner, and F. Wong. 2003. "Employee Stock Options, EPS Dilution, and Stock Repurchases." *Journal of Accounting and Economics* 36 (1–3): 51–90. <https://doi.org/10.1016/j.jacceco.2003.10.006>

The authors studied whether share repurchases are used to manage the dilutive effect of executive stock options (ESOs) on diluted earnings per share. The sample consists of 357 firms classified as S&P 500 Industrial from 1996 to 1999. The data sources are Compustat, CRSP, and the firms' annual filings. The authors found that the decision to repurchase shares is affected by the GAAP-defined measures of the dilutive effects of ESOs but not by actual ESO exercise. They also found evidence that companies repurchase more when earnings fall short of the target growth rates of diluted EPS.

Bhattacharya, U., and S. E. Jacobsen. 2015. "The Share Repurchase Announcement Puzzle: Theory and Evidence." *Review of Finance* 20 (2): 1–34.

This paper addresses, empirically and theoretically, why some firms announce open-market share repurchases but never repurchase any shares and why stock prices increase at the announcement of nonbinding OMR programs. The authors used data on US OMR programs from the SDC covering the period from January 1985 to September 2012 and data from Compustat, CRSP, Thomson Reuters Institutional Holdings (13F), and I/B/E/S. The authors found that companies that are more likely to have mispriced stock are less likely to repurchase shares after announcing a repurchase program. Also, studying companies that announced a share repurchase program, the authors found that cumulative abnormal returns and abnormal volume around the time of the announcement were significantly higher for firms that did not pursue the repurchase program than for those that repurchased shares following the announcement. These empirical findings are consistent with an equilibrium of a game that models interaction of a firm, opportunistic speculators, and noise traders.

Billett, M. T., and H. Xue. 2007. "The Takeover Deterrent Effect of Open Market Share Repurchases." *Journal of Finance* 62 (4): 1827–50. <https://doi.org/10.1111/j.1540-6261.2007.01258.x>

The authors investigated the role of open-market repurchase programs in deterring takeovers. The sample consists of a large number of OMRs in the United States from 1985 to 1996. The data sources are the SDC, Compustat, and CRSP. The authors document a significant positive association between the estimated takeover probability and the announcement of an open-market repurchase program. They interpret the results as evidence of OMR programs being partly driven by the perceived threat of a takeover.

Black, F. 1976. "The Dividend Puzzle." *Journal of Portfolio Management* 96 (5): 8–12.

Black challenges the readers with the question, why do corporations pay dividends? Reviewing various motivations for dividend payouts, such as taxes, transaction costs, investor demand, or portfolio choice, he comes to the conclusion that this question has no definite answer.

Bonaimé, A. 2012. “Repurchases, Reputation, and Returns.” *Journal of Financial and Quantitative Analysis* 47 (2): 469–91. <https://doi.org/10.1017/S0022109012000087>

Bonaimé provides evidence that a firm’s reputation in executing announced buyback programs matters. The study used US share repurchase data from the SDC for the 1988–2007 period and data from CRSP and Compustat. The study found, first, the completion rates (actual buyback amount divided by authorized amount) across different buyback programs are positively correlated. Second, the market reaction to announced buyback programs tends to be more positive if the announcing firm has high completion rates for previous buybacks. Evidence also shows that firms with a reputation for low completion rates often opt for alternatives to open-market buybacks, such as accelerated share repurchases.

Bonaimé, A. 2015. “Mandatory Disclosure and Firm Behavior: Evidence from Share Repurchases.” *Accounting Review* 90 (4): 1333–62. <https://doi.org/10.2308/accr-51027>

Bonaimé studied the effect of the 2003 change to SEC Rule 10b-18, which increased disclosure requirements for open-market repurchase programs. The sample consists of 6,240 OMRs in the United States from 1998 to 2007. The data sources are the SDC, Compustat, CRSP, Thomson Financial, and I/B/E/S. After the rule change, firms authorized fewer OMR programs but completed them at higher rates. The author interprets this finding as evidence that the increased disclosure requirement reduced the prevalence of false signaling via stock buybacks.

Bonaimé, A., K. Hankins, and J. Harford. 2013. “Financial Flexibility, Risk Management, and Payout Choice.” *Review of Financial Studies* 27 (4): 1074–101.

These authors studied how a firm’s hedging activities and its payout policy affect its ability to avoid financial distress and underinvestment. The sample consists of bank holding companies in the Federal Reserve quarterly Y-9C filings for the 1995–2008 period. First, the authors performed a cross-sectional analysis and document that firms with high cash flow volatility are more likely to care about financial flexibility, have greater payout flexibility (preference of repurchases over dividends), and are more active in risk management. The authors also used the staggered state-by-state transition

to more flexible fiduciary legislation as shocks to the cost–benefit trade-off of payout policy. They found that after the switch to more flexible regimes that favored share repurchases, companies decreased their use of dividends and their use of hedging. This empirical evidence supports the hypothesis that a firm’s payout policy and its hedging strategy are jointly determined, which is consistent with payout flexibility being a risk management device.

Bonaimé, A., and M. Ryngaert. 2013. “Insider Trading and Share Repurchases: Do Insiders and Firms Trade in the Same Direction?” *Journal of Corporate Finance* 22 (September): 35–53. <https://doi.org/10.1016/j.jcorpfin.2013.03.003>

The authors analyzed insider-trading and stock repurchase activity by a firm. They used data from the Compustat quarterly database for the 1989–2007 period and data on insider transactions from SEC Form 4 from the Thomson Reuters Insiders database. Contrary to the intuition of the *signaling* motive behind share repurchases, which implies that insiders should be net buyers (net sellers) more (less) frequently when a firm repurchases substantial amounts of stock in the same quarter, the authors found that repurchases are more likely to be accompanied by insider net selling. Stock repurchases with same-quarter net insider selling were associated with option exercises, less liquidity, lower book-to-market ratios, and higher prior returns, supporting the nonsignaling motives of these repurchases. When firms and insiders traded in the same direction, however, stock returns were abnormally high and persisted over the next three years after the repurchase.

Boudoukh, J., R. Michaely, M. Richardson, and M. R. Roberts. 2007. “On the Importance of Measuring Payout Yield: Implications for Empirical Asset Pricing.” *Journal of Finance* 62 (2): 877–915. <https://doi.org/10.1111/j.1540-6261.2007.01226.x>

This paper revisits the question of stock return predictability and points to measurement issues with using dividend yield and the price-to-dividend ratio. The authors argue that all forms of dividend and all substitutes of dividends, such as share repurchases, should be included in estimates of the dividend yield. Indeed, they found that the total and net payout yield measures are better predictors of stock returns.

Boudoukh, J., M. Richardson, and R. F. Whitelaw. 2008. “The Myth of Long-Horizon Predictability.” *Review of Financial Studies* 21 (4): 1577–605. <https://doi.org/10.1093/rfs/hhl042>

The authors studied short- and long-horizon stock return predictability and point out that regression estimates across different time horizons should be interpreted with caution in the models that use highly persistent predictive variables, such as dividend yield. The section of the paper on the existing literature provides a comprehensive review of literature on return predictability.

Brav, A., J. R. Graham, C. R. Harvey, and R. Michaely. 2005. "Payout Policy in the 21st Century." *Journal of Financial Economics* 77 (3): 483–527. <https://doi.org/10.1016/j.jfineco.2004.07.004>

These authors surveyed 384 financial executives and interviewed 23 top executives about motivations for firms' payout policies. Managers view share repurchases as a preferable payout method and may use them to time the equity market or to increase earnings per share. Executives believe that payout policies have little impact on their investor clientele. Overall, the management views here provide little support for the *agency*, *signaling*, and *clientele* hypotheses of payout policy.

Brockman, P., and D. Y. Chung. 2001. "Managerial Timing and Corporate Liquidity: Evidence from Actual Share Repurchases." *Journal of Financial Economics* 61 (3): 417–48. [https://doi.org/10.1016/S0304-405X\(01\)00068-X](https://doi.org/10.1016/S0304-405X(01)00068-X)

Analyzing firms listed on the Stock Exchange of Hong Kong (SEHK) over the 1991–99 period, the authors investigated whether managers have the ability to time the market by using the SEHK's unique disclosure environment, which mandates the disclosure of any buyback activity by 9:30 a.m. of the following business day. The repurchase information is from the SEHK's Share Repurchase Report. Return data are from Pacific-Basin Capital Markets and SEHK Research and Planning. The authors found that managers have substantial abilities to time the market; they can execute buybacks at about a 9% discount relative to a random execution of buybacks. The authors also found that the bid–ask spread increases during periods of buybacks, indicating worsening adverse selection.

Brockman, P., J. S. Howe, and S. Mortal. 2008. "Stock Market Liquidity and the Decision to Repurchase." *Journal of Corporate Finance* 14 (4): 446–59. <https://doi.org/10.1016/j.jcorpfin.2008.06.001>

The authors studied the impact of share repurchases on a stock's liquidity. Using data on mandatory disclosures of repurchase activity for firms listed on the Stock Exchange of Hong Kong for the 1991–99 period, the authors found that managers time their share repurchases to minimize transaction

costs. Also, consistent with the hypothesis of information asymmetry resulting from informed trading by the company, they found that bid-ask spreads widen and market depth decreases during the repurchase periods.

Brockman, P., I. K. Khurana, and X. Martin. 2008. "Voluntary Disclosures around Share Repurchases." *Journal of Financial Economics* 89 (1): 175–91. <https://doi.org/10.1016/j.jfineco.2007.08.004>

This study investigated a manager's incentive to alter information flows around stock repurchases. It used data on US share repurchase programs from the SDC for the 1994–2005 period and data from CRSP. Managerial forecast data are from the First Call database. The study found that managers tend to release bad news prior to stock repurchases and release good news afterward.

Brown, J. R., N. Liang, and S. Weisbenner. 2007. "Executive Financial Incentives and Payout Policy: Firm Responses to the 2003 Dividend Tax Cut." *Journal of Finance* 62 (4): 1935–65. <https://doi.org/10.1111/j.1540-6261.2007.01261.x>

The authors investigated whether executive stock ownership affects a company's payout policy. The sample is US companies in the 1993–2003 period. Company characteristics are from Compustat, stock returns are from CRSP, institutional ownership data are from CDA/Spectrum, and executive compensation data are from ExecuCOMP. The authors found that after the 2003 dividend tax cut, companies with higher executive stock ownership were more likely to increase dividends and reduce repurchases. Companies that historically paid large dividends experienced positive stock returns in response to the tax cut. This positive response was dampened, however, for companies with large executive stock holdings, suggesting that the market partially anticipates potential agency problems in the setting of payout policies at such companies.

Burns, N., B. C. McTier, and K. Minnick. 2015. "Equity-Incentive Compensation and Payout Policy in Europe." *Journal of Corporate Finance* 30 (February): 85–97. <https://doi.org/10.1016/j.jcorpfin.2014.10.019>

These authors examined the relationship between executive compensation contracts and payout policies in Europe. They used data on share repurchase programs in 15 European markets over the 2003–12 period and also data on CEO compensation, payout information, stock prices, and firm characteristics from Capital IQ for European markets. They found, in particular, that firms that have executive compensation packages that feature

equity-based pay (i.e., stock options and restricted stock) are more likely to repurchase shares than to issue dividends. The negative relationship between equity-based pay and dividend payout is attenuated, however, if the compensation contract is dividend protected.

Chan, K., D. L. Ikenberry, I. Lee, and Y. Wang. 2010. "Share Repurchases as a Potential Tool to Mislead Investors." *Journal of Corporate Finance* 16 (2): 137–58. <https://doi.org/10.1016/j.jcorpfin.2009.10.003>

Investigating whether managers potentially use stock buybacks as a tool to mislead investors, these authors identified a set of suspect buyback announcements by using abnormal accruals. The data on US share repurchase programs are from the Wall Street Journal Index and the SDC for the 1980–90 period. The authors show that these buyback announcements are less likely to be completed and are not associated with improved future firm performance.

Chang, S.-C., J.-H. Lai, and C.-H. Yu. 2005. "The Intra-Industry Effect of Share Repurchase Deregulation: Evidence from Taiwan." *Review of Pacific Basin Financial Markets and Policies* 8 (2): 251–77. <https://doi.org/10.1142/S0219091505000361>

This study exploited the deregulation of share repurchases in Taiwan in 2000 to investigate the effect of a firm's share repurchase announcement on its rivals' stock prices. The sample consists of 218 open-market repurchases in Taiwan in 2000 and 2001. The authors used data from the Share Repurchase Databases on the Market Observation Post System maintained by the Taiwan Stock Exchange Corporation, firm-level information from the Taiwan Economic Journal Data Bank, and additional industry information from the Dun & Bradstreet Taiwan Leading Corporations database. The authors found that both the announcing firm and its rivals experienced positive market responses to buybacks in the deregulated period.

Chen, A., and C.-S. Lu. 2015. "The Effect of Managerial Overconfidence on the Market Timing Ability and Post-Buyback Performance of Open Market Repurchases." *North American Journal of Economics and Finance* 33 (July): 234–51. <https://doi.org/10.1016/j.najef.2015.05.001>

These authors investigated the effect of managerial overconfidence on the ability of firms to time the market by using stock buybacks. The sample consists of 2,749 open-market repurchases in Taiwan from 2001 to 2013. The measure of CEO overconfidence is based on previous theoretical

works. The primary database used in this study is the Taiwan Economic Journal database. The authors found that firms with overconfident CEOs repurchase shares at higher prices and experience worse short-run announcement returns and worse long-run post-buyback returns. They also report that this negative effect of CEO overconfidence is mitigated by better governance.

Chen, S.-S., and C.-W. Huang. 2013. “The Sarbanes–Oxley Act, Earnings Management, and Post-Buyback Performance of Open-Market Repurchasing Firms.” *Journal of Financial and Quantitative Analysis* 48 (6): 1847–76. <https://doi.org/10.1017/S0022109014000040>

This paper describes a study of how the Sarbanes–Oxley Act of 2002, which was intended to protect investors from fraudulent financial reporting by firms, affects managers’ incentives to deflate pre-repurchase earnings and how the regulation affects firms’ post-repurchase performance. The authors analyzed 2,864 open-market purchase announcements over the 1984–2010 period from the SDC. Data on audit fees are from the Audit Analytics database, and governance variables are from RiskMetrics. The authors found, first, that SOX mitigates managers’ incentives to deflate pre-repurchase earnings to reduce repurchase prices. The SOX requirement for an independent audit and board committee may explain this finding. Second, the authors found that the negative relationship between pre-repurchase abnormal accruals and post-repurchase performance has disappeared.

Chen, S.-S., and Y. Wang. 2012. “Financial Constraints and Share Repurchases.” *Journal of Financial Economics* 105 (2): 311–31. <https://doi.org/10.1016/j.jfineco.2012.03.003>

The authors studied how the financial constraints of repurchasing firms affect firm performance following share repurchases. The sample is US share repurchase programs from the SDC database for the 1990–2007 period. Using three measures of financial constraint—the Kaplan–Zingales (1997) Index, cash–cash flow sensitivity, and investment–cash flow sensitivity—the authors found that financially constrained firms have a reduction in cash, cash flow, and investment and an increase in leverage after share repurchase announcements. Short- and long-term announcement period abnormal returns were significantly higher for unconstrained firms than for constrained firms. The authors also found that top managers of constrained firms tended to hold more in-the-money unexercised vested options than managers of unconstrained firms. Reconciling these empirical findings, the authors suggest that managers of constrained repurchasers

may postpone the exercise of their stock options because they overestimate the future returns of their firms.

Cheng, Y., J. Harford, and T. T. Zhang. 2015. “Bonus-Driven Repurchases.” *Journal of Financial and Quantitative Analysis* 50 (3): 447–75. <https://doi.org/10.1017/S0022109015000149>

The authors investigated the effect of CEO compensation structure on stock buybacks. The sample consists of 1,423 companies in the United States from 1993 to 2007. The data sources are the SDC, Compustat, CRSP, and the firms’ annual proxy statements (DEF 14A). The authors found that companies are more likely to repurchase shares when their CEOs are paid bonuses based on EPS targets. This effect is stronger when the company’s current earnings per share are just below the bonus threshold. This evidence suggests that share repurchases are driven, in part, by the structure of executive compensation.

Chung, D. Y., D. Isakov, and C. Perignon. 2007. “Repurchasing Shares on a Second Trading Line.” *Review of Finance* 11 (2): 253–85. <https://doi.org/10.1093/rof/rfm006>

The authors studied an alternative repurchase method in which the firm is authorized to repurchase shares via a special second trading line, a temporary trading platform that operates in parallel with regular trading. This repurchase method aims to minimize transaction costs and has some features of “sunshine trading,” which involves the public disclosure of the intent to trade. The authors used data by firms listed on the Swiss Stock Exchange or virt-x over the 1997–2004 period. Unique aspects of this setting allowed the authors to analyze implementation of share repurchases and their impact on liquidity. They found repurchasing firms in this study to be more active after a public announcement and less active prior to a public announcement, suggesting that Swiss firms conform with local regulations. The authors also found that repurchases via the second trading line improved the stocks’ liquidity; that is, trading volumes and depths increased while bid–ask spreads decreased on repurchase days.

Cochrane, J. H. 2008. “The Dog That Did Not Bark: A Defense of Return Predictability.” *Review of Financial Studies* 21 (4): 1533–75. <https://doi.org/10.1093/rfs/hhm046>

Cochrane analyzed the predictability of aggregate stock market returns. He points out that a null hypothesis in which returns are not predictable must also specify that dividend growth is predictable and the statistical

evaluation of that null must also test for the lack of dividend growth forecastability. Indeed, the joint test provides evidence of an absence of dividend growth predictability. The absence of dividend growth predictability—a dog that did not bark—implies the predictability of stock returns.

Comment, R., and G. A. Jarrell. 1991. “The Relative Signalling Power of Dutch-Auction and Fixed-Price Self-Tender Offers and Open-Market Share Repurchases.” *Journal of Finance* 46 (4): 1243–71. <https://doi.org/10.1111/j.1540-6261.1991.tb04617.x>

This paper presents a comparison of the signaling power of various forms of share repurchases: fixed-price tender offers, Dutch auction tender offers, and open-market repurchases. The sample is US firms from 1984 to 1989. Repurchase data are from the Dow Jones News/Retrieval service. Stock return data are from CRSP. The authors found that, compared with fixed-price tender offers, Dutch auction tender offers are associated with lower excess stock returns upon announcement (8% compared with 11%). They also found that open-market repurchase announcements tend to follow periods of stock underperformance; the magnitude of the underperformance was positively correlated with the size of the positive stock returns upon announcement, which averaged 2%. The results suggest that fixed-price tender offers provide the strongest signal of undervaluation.

Constantinides, G. M., and B. D. Grundy. 1989. “Optimal Investment with Stock Repurchase and Financing as Signals.” *Review of Financial Studies* 2 (4): 445–65. <https://doi.org/10.1093/rfs/2.4.445>

This paper provides a signaling theory of stock buybacks. Unlike dividends, which are paid to all shareholders, including manager/owners, share repurchases do not transfer cash to manager/owners if they are not allowed to sell their shares. As a result, manager/owners can signal positive prospects by issuing senior securities to simultaneously fund new investments and share repurchases.

Cook, D. O., L. Krigman, and J. C. Leach. 2003. “An Analysis of SEC Guidelines for Executing Open Market Repurchases.” *Journal of Business* 76 (2): 289–315. <https://doi.org/10.1086/367751>

These authors studied the history of repurchase regulation with a focus on the SEC’s safe harbor rule, Rule 10b-18 in the Securities Exchange Act of 1934. The study uses privately disclosed data on share repurchases from 54 firms in the 1993–94 period. Rule 10b-18 describes the code of conduct for share repurchases that provides firms with protection from charges of

stock price manipulation when repurchasing shares in the open market. The authors found that firms comply with Rule 10b-18 in the majority of their repurchases.

Cook, D. O., L. Krigman, and J. C. Leach. 2004. "On the Timing and Execution of Open Market Repurchases." *Review of Financial Studies* 17 (2): 463–98. <https://doi.org/10.1093/rfs/hhg028>

Using transaction-level data on open-market share repurchase programs, the authors analyzed implementation and transaction costs of programs and their impact on market liquidity. They used voluntarily disclosed data of 64 firms on implementation of repurchase programs in the 1993–94 period and the NYSE Trade and Quote database. The authors found mixed evidence on the costs of repurchase programs: The costs of programs of large, NYSE-listed firms were low, whereas those of small, Nasdaq-listed firms were high. They found, consistent with a price support strategy, that firms repurchase shares following price drops. The authors also found that repurchasing improves market liquidity on the days of actual repurchase trades.

Cuny, C. J., G. S. Martin, and J. J. Puthenpurackal. 2009. "Stock Options and Total Payout." *Journal of Financial and Quantitative Analysis* 44 (2): 391–410. <https://doi.org/10.1017/S0022109009090115>

Using data on US firms from 1993 to 2005 and data from ExecuCOMP and Compustat, the authors examined the relationship between the structure of executive compensation and total firm payouts. They found that firms with more executive stock options have lower total payouts. They also document an antidilution effect; that is, firms increase repurchases to offset the dilution effect of stock option use on EPS. The increase in share repurchase does not offset the reduction in dividends, however, which leads to a lower total payout.

Custodio, C., and D. Metzger. 2014. "Financial Expert CEOs: CEO's Work Experience and Firm's Financial Policies." *Journal of Financial Economics* 114 (1): 125–54. <https://doi.org/10.1016/j.jfineco.2014.06.002>

These authors analyzed the relationship between a CEO's financial expertise and the firm's payout policies. Data are for US firms in the 1993–2007 period. The data are from Compustat, Datastream, ICARUS, Orbis, ExecuCOMP, BoardEx, I/B/E/S, DealScan, and CRSP. The authors found, after controlling for the typical determinants of payout policy, that

financial expert CEOs are more likely to repurchase shares than nonexpert CEOs.

Dann, L. Y. 1981. "Common Stock Repurchases: An Analysis of Returns to Bondholders and Stockholders." *Journal of Financial Economics* 9 (2): 113–38. [https://doi.org/10.1016/0304-405X\(81\)90010-6](https://doi.org/10.1016/0304-405X(81)90010-6)

Dann investigated the effects of stock buybacks on bondholder and shareholder welfare. Using a sample of 300 repurchase tender offers in the United States from 1962 to 1976, the *Wall Street Journal*, the *Investment Dealers' Digest*, company filings, and manuals from Moody's Investors Service and Standard & Poor's, the author documents positive wealth changes for holders of common stock, convertible debt, and convertible preferred stock. Data sources include the *Wall Street Journal*, the *Investment Dealers' Digest*, CRSP, and company SEC filings. He found no evidence, however, of an adverse effect on the wealth of owners of straight debt and straight preferred stock. These results do not support the hypothesis that stock buybacks transfer wealth from debtholders to equityholders.

Darrough, M. N., and N. M. Stoughton. 1990. "Financial Disclosure Policy in an Entry Game." *Journal of Accounting and Economics* 12 (1–3): 219–43. [https://doi.org/10.1016/0165-4101\(90\)90048-9](https://doi.org/10.1016/0165-4101(90)90048-9)

The authors model the disclosure of a firm's proprietary information. A firm faces the following trade-off. It wants to disclose favorable information to the financial market in order to raise its valuation but does not want to make this information known to potential competitors. Three equilibriums are identified: full disclosure, nondisclosure, and partial disclosure, in which favorable information is never disclosed but unfavorable information is sometimes disclosed.

DeAngelo, H., L. DeAngelo, and D. J. Skinner. 2000. "Special Dividends and the Evolution of Dividend Signaling." *Journal of Financial Economics* 57 (3): 309–54. [https://doi.org/10.1016/S0304-405X\(00\)00060-X](https://doi.org/10.1016/S0304-405X(00)00060-X)

These authors studied special dividends that were a common form of payout among the NYSE firms in the 1940s. The authors document that special dividends had gradually disappeared by the 1990s, but they found no evidence of substitution with share repurchases.

De Cesari, A., S. Espenlaub, and A. Khurshed. 2011. "Stock Repurchases and Treasury Share Sales: Do They Stabilize Price and Enhance Liquidity?" *Journal of Corporate Finance* 17 (5): 1558–79. <https://doi.org/10.1016/j.jcorpfin.2011.08.002>

The authors studied the effect of stock repurchase and treasury share sales on liquidity and volatility. The data sources are Datastream, Factiva, and the firms' annual reports. Using a sample of Italian firms from 1997 to 2004, the study found that these transactions improved liquidity (lower bid-ask spread) and lowered excess volatility, which is consistent with the stated motives of these firms.

Dittmar, A. 2000. "Why Do Firms Repurchase Stock?" *Journal of Business* 73 (3): 331–55. <https://doi.org/10.1086/209646>

Dittmar provides a careful investigation of why companies repurchase shares. The sample period is 1977 to 1996. Data sources include the SDC, CRSP, and Compustat. Dittmar found that firms repurchase stock to take advantage of potential undervaluation and to distribute excess capital. However, repurchases do not replace dividends. Firms may also repurchase stock to adjust their leverage ratio, deter takeovers, and counter the dilution effects of stock options.

Dittmar, A., and R. Dittmar. 2008. "The Timing of Financing Decisions: An Examination of the Correlation in Financing Waves." *Journal of Financial Economics* 90 (1): 59–83. <https://doi.org/10.1016/j.jfineco.2007.11.007>

Using data on US firms from a CRSP–Compustat merged database for 1971–2004, the authors investigated how aggregate valuation affects financing waves. They found that the waves of equity issuance and share repurchases are positively correlated. GDP growth is posited to be the fundamental factor driving both types of financing waves.

Dittmar, A., and L. Field. 2015. "Can Managers Time the Market? Evidence Using Repurchase Price Data." *Journal of Financial Economics* 115 (2): 261–82. <https://doi.org/10.1016/j.jfineco.2014.09.007>

The authors investigated the timing of actual buybacks during open-market repurchase programs in a large sample of open-market buyback programs in the United States from 2004 to 2011. The data sources are the SDC, Compustat, CRSP, and the firms' quarterly filings. The authors found that firms repurchase shares at a price significantly lower than the average market price. Moreover, firms that do not repurchase frequently and firms that repurchase when their insiders purchase buy back shares at significantly lower prices. This evidence suggests that some managers can time the market.

Dow, C. H. 1920. *Scientific Stock Speculation*. New York: Magazine of Wall Street.

This book is a reprint of a series of articles on stock speculation that Charles H. Dow, head of the Dow Jones News Bureau, wrote for the *Wall Street Journal* at the beginning of the 20th century. Although more than 100 years have passed, many of these strategies are still used by financial professionals.

Drousia, A., A. Episcopos, G. N. Leledakis, and E. G. Pyrgiotakis. Forthcoming. “EU Regulation and Open Market Share Repurchases: New Evidence.” *European Journal of Finance*. <https://doi.org/10.1080/1351847X.2021.1910529>

The authors studied the effect of the introduction of a safe harbor in the EU Market Abuse Directive (MAD) on share repurchase announcements by examining the returns of 548 Greek firms over the 2000–10 period. The authors collected Greek share repurchase data by hand from the *Government Gazette* and the Daily Official List of the Athens Stock Exchange. Other data sources are Thomson Reuters, Worldscope, and Datastream. Consistent with the intuition that share repurchase programs are more informative in a more transparent environment, the authors found a positive MAD effect on announcement abnormal returns.

Erwin, G. R., and J. M. Miller. 1998. “The Intra-Industry Effects of Open Market Share Repurchases: Contagion or Competitive?” *Journal of Financial Research* 21 (4): 389–406. <https://doi.org/10.1111/j.1475-6803.1998.tb00693.x>

Analyzing the intra-industry effects of open-market repurchase programs, the authors found that the announcement of an open-market repurchase program increases the stock price of the announcer and decreases the stock prices of rivals. The sample consists of 754 OMR programs in US firms from 1985 to 1990, which excludes buybacks around the time of the 1987 stock market crash. The data sources are the *Wall Street Journal*, Compustat, and CRSP. The authors interpret the findings as evidence that OMR programs convey positive information about the competitive position of the announcing firm, which represents bad news for rival firms.

Fama, E., and K. French. 1988. “Dividend Yields and Expected Stock Returns.” *Journal of Financial Economics* 22 (1): 3–25.

The authors analyzed the predictability of stock returns. Motivated by the Gordon growth model, they found evidence that the dividend yield (dividend to price) predicts expected stock returns.

Fama, E., and K. French. 1993. "Common Risk Factors in the Returns on Stocks and Bonds." *Journal of Financial Economics* 33 (1): 3–56. [https://doi.org/10.1016/0304-405X\(93\)90023-5](https://doi.org/10.1016/0304-405X(93)90023-5)

This paper proposes five risk factors that seem to explain average returns on stocks and bonds. The three stock market factors are overall market, size, and book-to-market ratio. The two bond market factors are maturity and default risk.

Fama, E., and K. French. 2001. "Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay?" *Journal of Financial Economics* 60 (1): 3–43. [https://doi.org/10.1016/S0304-405X\(01\)00038-1](https://doi.org/10.1016/S0304-405X(01)00038-1)

The authors document that the proportion of dividend-paying firms fell from more than 65% in 1978 to just 20% in 1999. This pattern is not entirely explained by the changing characteristics of publicly traded firms.

Faulkner, M., and L. Garcia-Feijóo. Forthcoming. "Hot-Stove Effects: The Impact of CEO Past Corporate Experiences on Dividend Policy." *Journal of Financial and Quantitative Analysis*. <https://doi.org/10.1017/S002210902100034X>

The authors investigated the effect of a CEO's past corporate experiences on the firm's payout policy. Data sources include Compustat, CRSP, ExecuCOMP, and BoardEx. Using a large sample of firms in the United States from 1983 to 2017, they show that CEOs who have experienced a distress event in other firms adopt conservative payout policies. The CEOs in the study paid lower dividends and repurchased fewer shares than other CEOs. Conditional on a payout level, they were more likely to repurchase shares than pay dividends. These results highlight a link between a CEO's experience in a previous firm and the CEO's payout policy in the current firm.

Fazzari, S., R. G. Hubbard, and B. C. Petersen. 1988. "Financing Constraints and Corporate Investment." *Brookings Papers on Economic Activity* 1988 (1): 141–206.

This paper reports a study of the relationship between financial constraints and corporate investment. The authors incorporated the effect of market frictions on a firm's access to capital markets into a conventional model of investment.

Fenn, G. W., and N. Liang. 2001. "Corporate Payout Policy and Managerial Stock Incentives." *Journal of Financial Economics* 60 (1): 45–72. [https://doi.org/10.1016/S0304-405X\(01\)00039-3](https://doi.org/10.1016/S0304-405X(01)00039-3)

The authors examined how managerial stock incentives affect corporate payout policy. Using data on 1,100 companies between 1993 and 1997, they document that higher managerial stock ownership is associated with higher payouts only for firms with the greatest agency problems, such as those with high free cash flows and few investment opportunities. Moreover, they found that the structure of managerial compensation is related to the type of payout. Firms with more managerial stock options are less likely to pay dividends and more likely to repurchase shares. The authors propose that the increase in share repurchases is driven, in part, by the rise of managerial stock options.

Ginglinger, E., and J. Hamon. 2007. "Actual Share Repurchases, Timing and Liquidity." *Journal of Banking & Finance* 31 (3): 915–38. <https://doi.org/10.1016/j.jbankfin.2006.07.006>

Using repurchase data from the Paris Stock Exchange, these authors studied the timing of actual repurchases and their impact on stocks' liquidity. They used share repurchase data on all firms listed on the Paris exchange from the Autorité des marchés financiers. The sample period is 2000–2002. They found that companies repurchase shares following periods of negative abnormal returns, but they found no significant positive abnormal returns after share repurchases. These results are consistent with the *price support* hypothesis but contradict the intuition that managers repurchase shares based on private information. Furthermore, they found that liquidity deteriorates on share repurchase days.

Gong, G., H. Louis, and A. X. Sun. 2008. "Earnings Management and Firm Performance Following Open Market Repurchases." *Journal of Finance* 63 (2): 947–86. <https://doi.org/10.1111/j.1540-6261.2008.01336.x>

This paper reports an investigation into how earnings management prior to share repurchases affects the firm's post-repurchase performance. The sample covers US firms from 1984 to 2002; data are from the SDC, Compustat, and CRSP. The authors found that downward earnings management proxied by abnormal negative accruals is positively associated with post-repurchase improvements in operating performance. The result suggests that some firms beat expectations after repurchases because the previous expectations were based on deflated pre-repurchase earnings.

Goyal, A., and I. Welch. 2003. "Predicting the Equity Premium with Dividend Ratios." *Management Science* 49 (5): 639–54. <https://doi.org/10.1287/mnsc.49.5.639.15149>

The authors reexamined whether the aggregate dividend yield or the dividend-to-price ratio predicts excess return of the aggregate stock market. In contrast to earlier research on return predictability, the authors found that predictability became weaker and disappeared by 2001. They also show that this pattern could be the result of increasing persistence of the dividend–price ratio.

Grullon, G., and D. L. Ikenberry. 2000. "What Do We Know about Stock Repurchases?" *Journal of Applied Corporate Finance* 13 (1): 31–51. <https://doi.org/10.1111/j.1745-6622.2000.tb00040.x>

This paper provides a review of share repurchases. It starts with documenting historical trends in repurchase activity over the 1980–99 period and then reviews various motivations for share repurchases—an earnings "bump," cash flow signaling, market undervaluation, the agency cost of free cash flows, capital market allocation, dividend substitution, capital structure adjustment, and stock liquidity.

Grullon, G., and R. Michaely. 2002. "Dividends, Share Repurchases, and the Substitution Hypothesis." *Journal of Finance* 57 (4): 1649–84. <https://doi.org/10.1111/1540-6261.00474>

In this paper, the authors aim to rationalize the growth of share repurchase activity in the United States over the 1972–2000 period, when repurchases became a more popular payout method than dividend payments. Using data from Compustat, the authors found support for the substitution of repurchases for dividends. Even after controlling for firm characteristics, firms had a lower propensity to pay dividends after the mid-1980s than they did in the past. Moreover, adaptation of the SEC's safe harbor rule, Rule 10b-18, was a significant factor that intensified share repurchase activity.

Grullon, G., and R. Michaely. 2004. "The Information Content of Share Repurchase Programs." *Journal of Finance* 59 (2): 651–80. <https://doi.org/10.1111/j.1540-6261.2004.00645.x>

Contrary to the *signaling* hypothesis, in examining the information content of repurchase program announcements, these authors found no evidence that share repurchase announcements predict higher measures

of firm performance, such as earnings. Instead, they found evidence in support of the *free cash flow* hypothesis. The authors used data on share repurchase programs in US firms from the SDC (after 1984) and hand-collected OMR program announcements from the *Wall Street Journal* (for 1980–1984). They found that repurchasing firms reduce capital expenditures and R&D investment, which is consistent with the idea that firms with few investment opportunities return excess cash to shareholders. The authors posit that repurchases are associated with a firm's transition from a high-growth phase to a low-growth phase.

Guay, W., and J. Harford. 2000. "The Cash-Flow Permanence and Information Content of Dividend Increases versus Repurchases." *Journal of Financial Economics* 57 (3): 385–415. [https://doi.org/10.1016/S0304-405X\(00\)00062-3](https://doi.org/10.1016/S0304-405X(00)00062-3)

This paper provides evidence for the hypothesis that firms choose between paying dividends and repurchasing shares partly on the basis of the permanence of cash flow shocks. The sample is US share repurchase programs from the SDC database for 1981–1993; the authors also used data from CRSP and Compustat. The authors found that cash flow shocks prior to dividend increases are significantly more permanent than those shocks preceding share repurchases. In addition, they provide evidence that the market uses these changes to payout policy to update its belief about the permanence of cash flow shocks.

Hall, B., and J. Liebman. 1998. "Are CEOs Really Paid Like Bureaucrats?" *Quarterly Journal of Economics* 113 (3): 653–91. <https://doi.org/10.1162/003355398555702>

This paper documents the relationship between firm performance and CEO compensation. Using a 15-year panel dataset of CEOs of large publicly traded US firms, the authors report an increase in CEO holdings of stocks and stock options, which strengthens the relationship between firm performance and CEO compensation.

Harford, J., S. A. Mansib, and W. F. Maxwell. 2008. "Corporate Governance and Firm Cash Holdings in the US." *Journal of Financial Economics* 87 (3): 535–55. <https://doi.org/10.1016/j.jfineco.2007.04.002>

These authors investigated the relationship between governance and cash holdings in US firms. They analyzed 1,872 US firms over the 1993–2004 period and used data from Compustat (firms' characteristics), the Investor

Responsibility Research Center (G-Index as a measure of governance), ExecuCOMP (executive compensation), and Thomson Financial Institutional Ownership. They found that in the cross section and over time, firms with better governance have higher cash holdings. Firms with weaker governance spend more on capital expenditures and are more aggressive with acquisition activities. They show that governance shapes payout policies. Firms with strong governance return excess cash via dividends. Firms with weaker governance return excess cash via repurchases. The authors posit that weak governance leads a firm to distribute excess cash without establishing commitment.

Harris, O., and C. Glegg. 2009. "Governance Quality and Privately Negotiated Stock Repurchases: Evidence of Agency Conflict." *Journal of Banking & Finance* 33 (2): 317–25. <https://doi.org/10.1016/j.jbankfin.2008.08.007>

This paper reports a study of how shareholder protection affects the impact of privately negotiated repurchases on shareholder wealth. The sample covers US firms for 1994–2007. The authors used repurchase data from the SDC and governance data from the Investor Responsibility Research Center. The study found that privately negotiated repurchases involve higher premiums when shareholder rights are weak. Moreover, in the sample, the abnormal positive long-run returns following privately negotiated repurchases were concentrated in a subsample of events involving firms with strong shareholder protection. The authors attribute their findings to an underlying agency problem between shareholders and managers.

Hertzel, M. G. 1991. "The Effects of Stock Repurchases on Rival Firms." *Journal of Finance* 46 (2): 707–16. <https://doi.org/10.1111/j.1540-6261.1991.tb02681.x>

Hertzel analyzed the intra-industry effects of stock buybacks. The sample consists of 134 stock buybacks by US firms in the 1970–84 period. Repurchase information is from the dataset compiled in 1987. Data on company characteristics are from Compustat, and stock price data are from CRSP. Additional industry-level information is from the Value Line Investment Survey. Hertzel found that the announcement of a stock buyback increases the stock price of the announcer but does not have a significant effect on the stock prices of rivals. He interprets these findings as evidence that stock buybacks mainly convey firm-specific information to the market.

Hillert, A., E. Maug, and S. Obernberger. 2016. "Stock Repurchases and Liquidity." *Journal of Financial Economics* 119 (1): 186–209. <https://doi.org/10.1016/j.jfineco.2015.08.009>

The authors used an instrumental variables approach to investigate the effect of open-market repurchase programs on stock liquidity. The sample consists of 6,150 firms in the United States for 2004–2010. Repurchase information is from 10-Q and 10-K filings after the new disclosure requirements in the United States starting in 2004 and from the SDC. Company-level information is from Compustat and CRSP. Institutional holdings information is from the I/B/E/S database. Additional quotes and trade data are from the Trade and Quote database. The authors show that open-market repurchase programs have a positive effect on stock liquidity. Moreover, they argue that the conflicting results documented in previous studies stem from issues related to endogenous controls.

Hodrick, L. S. 1999. "Does Stock Price Elasticity Affect Corporate Financial Decisions?" *Journal of Financial Economics* 52 (2): 225–56. [https://doi.org/10.1016/S0304-405X\(99\)00009-4](https://doi.org/10.1016/S0304-405X(99)00009-4)

Hodrick examined the effect of stock price elasticity on corporate policies. The sample consists of 166 repurchase tender offers by US firms between 1984 and 1989. The repurchase information is from Comment and Jarrell (1991). Additional firm-level information, such as institutional ownership, index inclusion, and listed exchange, is from the Standard & Poor's Security Owner's Stock Guide. Hodrick shows that firms that anticipate greater stock price elasticity are more likely to choose Dutch auction repurchase tender offers than fixed-price repurchase tender offers, which is consistent with standard economic principles.

Hong, H., J. Wang, and J. Yu. 2008. "Firms as Buyers of Last Resort." *Journal of Financial Economics* 88 (1): 119–45. <https://doi.org/10.1016/j.jfineco.2007.04.004>

The authors built and tested a model of stock repurchase in which the firm acts as a buyer of last resort for its shares. In the model, because market makers have limited risk-bearing capacity, large liquidity shocks to a firm's shareholders move that firm's stock price far below its fundamental value. Share repurchases by the firm help stabilize the stock price. The authors provide empirical evidence supporting the predictions of the model. Using a broad sample of US firms from 1971 to 2005, they show that firms with a greater ability to repurchase have lower short-horizon return volatility, and this correlation became stronger after 1982, when the legal costs of share

repurchases decreased. Using less detailed data from Japan, the United Kingdom, France, Germany, Canada, Italy, the Netherlands, Switzerland, and Hong Kong, the authors also found supporting evidence in their cross-market analysis. Data sources include CRSP, Compustat, Compustat Global, and the SDC.

Hovakimian, A., T. Opler, and S. Titman. 2001. "The Debt–Equity Choice." *Journal of Financial and Quantitative Analysis* 36 (1): 1–24. <https://doi.org/10.2307/2676195>

Using data from Compustat on US firms for 1979–1997, the authors investigated the capital structure policy of firms. They estimated the target debt level for firms in the sample and found that when the target debt ratio exceeded the actual ratio, firms were more likely to repurchase shares, which increased their leverage.

Ikenberry, D., J. Lakonishok, and T. Vermaelen. 1995. "Market Underreaction to Open Market Share Repurchases." *Journal of Financial Economics* 39 (2–3): 181–208. [https://doi.org/10.1016/0304-405X\(95\)00826-Z](https://doi.org/10.1016/0304-405X(95)00826-Z)

The authors analyzed the long-term performance of US firms that announce open-market repurchase programs. The data on US OMR announcements for the period between January 1980 and December 1990 were collected by hand from the *Wall Street Journal*. The authors found an average abnormal return of a buy-and-hold portfolio of 12% over a four-year post-announcement period. Restricting the sample to high-book-to-market (value) stocks that were likely to be undervalued, the authors report an average abnormal return of 45%. This evidence is consistent with the *undervaluation* hypothesis.

Ikenberry, D., J. Lakonishok, and T. Vermaelen. 2000. "Stock Repurchases in Canada: Performance and Strategic Trading." *Journal of Finance* 55 (5): 2373–97. <https://doi.org/10.1111/0022-1082.00291>

This paper provides international evidence of short- and long-term performance of stocks around the time of share repurchase announcements. Using a sample of companies listed on the Toronto Stock Exchange over the 1989–97 period, the authors document that the firms repurchasing shares in the period had abnormal returns of 0.59% per month over a three-year period following the announcement whereas the abnormal returns were negative (–20.35% per month) in the year prior to the announcement. The results are stronger for value stocks than growth stocks. This evidence supports the *undervaluation* hypothesis and provides external validity for research using US share repurchase data.

Jagannathan, M., and C. Stephens. 2003. “Motives for Multiple Open-Market Repurchase Programs.” *Financial Management* 32 (2): 71–91. <https://doi.org/10.2307/3666337>

This paper reports a study of the motives for open-market repurchase programs. The authors examined a large sample of OMRs in the United States from 1986 to 1996. Share repurchase data are from the SDC database and the *Wall Street Journal*. The study also used data from Compustat, CRSP, and I/B/E/S. The paper documents that firms that frequently repurchase have different characteristics from firms that do not. Firms that frequently repurchase tend to be larger, have less variation in operating income, and pay more dividends. The authors did not find evidence of improved operating performance following repurchase announcements, contrary to the *signaling* hypothesis of buybacks.

Jagannathan, M., C. P. Stephens, and M. S. Weisbach. 2000. “Financial Flexibility and the Choice between Dividends and Stock Repurchases.” *Journal of Financial Economics* 57 (3): 355–84. [https://doi.org/10.1016/S0304-405X\(00\)00061-1](https://doi.org/10.1016/S0304-405X(00)00061-1)

The authors investigated how financial flexibility relates to corporate pay-out policy. They analyzed a sample of US share repurchase announcements from the SDC database over the 1985–96 period and found that share repurchases tend to be pro-cyclical whereas dividends tend to increase steadily. The paper provides evidence that increases in permanent cash flows are paid out via dividends whereas temporary increases in cash flows are paid out via share repurchases. Share repurchases were also found to be more often used by firms with volatile cash flows. The authors posit that share repurchases are used because of the financial flexibility that they provide.

Jennings, R., M. LeClere, and R. Thompson. 1997. “Evidence on the Usefulness of Alternative Earnings per Share Measures.” *Financial Analysts Journal* 53 (6): 24–33. <https://doi.org/10.2469/faj.v53.n6.2127>

The authors investigated the effect of the 1997 FASB rule change regarding the computation of earnings per share, requiring companies to report a “basic” EPS measure, which ignores potential dilution, and a “diluted” EPS measure, which accounts for the impact of potentially dilutive contracts. The analysis, based on the variation of stock price explained by various measures of EPS, suggests that the new disclosure rule may provide analysts and investors with better information.

Jensen, M. C. 1986. "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers." *American Economic Review* 76 (2): 323–29.

The author presents a theory of agency conflict between the firm's manager and shareholders. Managers have an incentive to overinvest for many reasons, such as compensation based on growth and intrinsic empire-building motives. Payouts that reduce free cash flows mitigate this agency conflict.

Jensen, M. C., and K. J. Murphy. 1990. "Performance Pay and Top-Management Incentives." *Journal of Political Economy* 98 (2): 225–64. <https://doi.org/10.1086/261677>

The authors investigated the pay–performance sensitivity of a large sample (2,213) of CEOs. The resulting estimates are that, on average, CEO wealth increases by \$3.5 for every \$1,000 of shareholder wealth created.

Jun, S.-G., M. Jung, and R. A. Walkling. 2009. "Share Repurchase, Executive Options and Wealth Changes to Stockholders and Bondholders." *Journal of Corporate Finance* 15 (2): 212–29. <https://doi.org/10.1016/j.jcorpfin.2008.11.003>

The study reported in this paper investigated the effects of stock buybacks on bondholder and shareholder welfare. Data sources include the Trade Reporting and Compliance Engine, the Mergent Fixed Income Securities Database, CRSP, Compustat, and the SDC. Using a sample of 366 stock buybacks in the United States from 1991 to 2002, the authors show that stock buybacks, on average, have a positive wealth effect on equityholders. Overall, they report that stock buybacks have an ambiguous effect on the wealth of debtholders because of the offsetting effects of signaling and wealth transfer. In a subsample of repurchases that were likely used to offset equity compensation for employees rather than to signal undervaluation, the authors found that share repurchases had a negative wealth effect on debtholders.

Kahle, K. M. 2002. "When a Buyback Isn't a Buyback: Open Market Repurchases and Employee Options." *Journal of Financial Economics* 63 (2): 235–61. [https://doi.org/10.1016/S0304-405X\(01\)00095-2](https://doi.org/10.1016/S0304-405X(01)00095-2)

Kahle shows that firms often announce buybacks to fund employee stock options. This finding is based on analysis of US share repurchase programs in the SDC database over the 1991–96 period and data from CRSP, ExecuCOMP, and Compustat. Given a buyback program, the actual amount of stocks repurchased was found to be positively correlated with the amount of exercisable stock options held by nonmanagers. The market

reacted less positively to buyback announcements by firms with a high level of nonmanagerial stock options.

Kahle, K. M., and R. M. Stulz. 2021. “Why Are Corporate Payouts So High in the 2000s?” *Journal of Financial Economics* 142 (3): 1359–80. <https://doi.org/10.1016/j.jfineco.2021.06.020>

Using a large sample of US firms for 1971–2019 primarily from Compustat to investigate corporate payouts, the authors document a substantial rise in aggregate payouts over the period. When calculated as a percentage of aggregate corporate assets, the figure increased from an average of 2.88% for 1971–1999 to an average of 4.40% for 2000–2019. When measured as a percentage of aggregate operating income, the figure increased from an average of 19.19% for 1971–1999 to an average of 33.68% for 2000–2019. Moreover, this surge in aggregate payouts was driven entirely by stock buybacks. The authors attribute the rise in payouts to changes in firm characteristics and increased monitoring by institutional investors.

Kaplan, S. N., and L. Zingales. 1997. “Do Investment–Cash Flow Sensitivities Provide Useful Measures of Financing Constraints?” *Quarterly Journal of Economics* 112 (1): 169–215. <https://doi.org/10.1162/003355397555163>

The authors studied the relationship between financing constraints and investment–cash flow sensitivities. The authors classified firms into five categories based on their level of financial constraint and related their classification to accounting variables in logit regressions. Their results may be used to estimate their KZ Index of financial constraint.

Kim, J., R. Schremper, and N. Varaiya. 2005. “Open Market Repurchase Regulations: A Cross-Country Examination.” *Corporate Finance Review* 9 (4): 29–38.

This paper examines regulations for open-market repurchase programs in 10 jurisdictions: the United States, Japan, the United Kingdom, France, Germany, Canada, Italy, the Netherlands, Switzerland, and Hong Kong. It documents a substantial variation in disclosure requirements among different jurisdictions.

Lambert, R., W. Lanen, and D. Larcker. 1989. “Executive Stock Option Plans and Corporate Dividend Policy.” *Journal of Financial and Quantitative Analysis* 24 (4): 409–25. <https://doi.org/10.2307/2330976>

The authors examined the effect on dividend policy of stock option grants for executives. The sample consists of 221 Fortune 500 and Fortune 50

merchandising firms for the calendar year 1956. Company-level data, including information on executive compensation, are from the companies' annual filings. Data on stock prices are from CRSP. The authors posit that the lack of dividend protection in most stock option grants discourages executives from paying additional dividends, which would lower the value of their stock options. Consistent with this hypothesis, they report that stock option grants for executives are associated with a subsequent reduction in dividends.

Lee, B. S., and J. Suh. 2011. "Cash Holdings and Share Repurchases: International Evidence." *Journal of Corporate Finance* 17 (5): 1306–29. <https://doi.org/10.1016/j.jcorpfin.2011.06.006>

This paper provides international evidence on share repurchase activity based on Worldscope repurchase data from Australia, Canada, France, Germany, Japan, the United Kingdom, and the United States over the 1998–2006 period. The authors performed cross-market analysis of the relationship between a firm's characteristics and its share repurchase activity. They establish that cash holdings are positively related to share repurchases. This result is consistent for the seven markets and holds for both dividend-paying and non-dividend-paying companies. No consistent patterns were found for other firm characteristics. This evidence supports the *excess capital* hypothesis. Further analyzing the nature of the cash holdings, the authors found that the cash of repurchasing firms is excess cash that has been obtained relatively close to the time of share repurchases via reduction in capital expenditures, rather than improvements in operating profitability or operating cash flows. These findings contradict the prediction of the *cash flow–signaling* hypothesis that share repurchases signal improvements in operating performance.

Lee, I., Y. J. Park, and N. D. Pearson. 2020. "Repurchases after Being Well Known as Good News." *Journal of Corporate Finance* 62 (June). <https://doi.org/10.1016/j.jcorpfin.2019.101552>

The authors studied the long-run abnormal returns following stock buyback announcements in a sample of 11,795 open-market repurchases in the United States from 1994 to 2014. Data sources include the SDC, Compustat, and CRSP. The authors document that post-announcement positive long-run abnormal returns after 2001 are much smaller than they were in the 1990s. These results suggest that recent stock buybacks are less motivated by signaling or undervaluation than they were in previous periods.

Lintner, J. 1956. "Distribution of Incomes of Corporations among Dividends, Retained Earnings, and Taxes." *American Economic Review* 40 (4): 97–113.

Lintner examined how firms determine their dividend policy. Reconciling empirical findings from a field survey of 600 firms, he posits that a firm's dividend policy is a function of its targeted payout ratio and the speed of adjustment of current dividends.

Louis, H., and H. White. 2007. "Do Managers Intentionally Use Repurchase Tender Offers to Signal Private Information? Evidence from Firm Financial Reporting Behavior." *Journal of Financial Economics* 85 (1): 205–33. <https://doi.org/10.1016/j.jfineco.2006.08.003>

The authors investigated the signaling intent of repurchase tender offers by US firms between 1981 and 2001 by analyzing the pre-repurchase financial reporting behavior of managers. They used share repurchase programs from the SDC and also data from CRSP, Compustat, I/B/E/S, EDGAR, and Factiva. They argue that repurchases for opportunistic purposes are associated with earnings management that deflates the stock price prior to the announcement. In contrast, repurchases for signaling purposes are not. They found that Dutch auction tender offers are associated with significantly negative discretionary accruals in the period prior to the offer, suggesting that the intent of such repurchases is not signaling. In contrast, fixed-price tender offers are not associated with such negative accruals, suggesting that the intent of those repurchases is to signal the firm's undervaluation.

Massa, M., Z. Rehman, and T. Vermaelen. 2007. "Mimicking Repurchases." *Journal of Financial Economics* 84 (3): 624–66. <https://doi.org/10.1016/j.jfineco.2006.02.006>

Using data on a broad sample of US firms for 1984–2002 from the CRSP–Compustat merged database and data from Standard & Poor's (on executive compensation), CDA/Spectrum, and the SDC, the authors explored the industry clustering of repurchase announcements. They posit that a firm's repurchase announcement sends a positive signal about itself and a negative signal about its competitors; consequently, competing firms mimic by announcing their own repurchase programs. The authors found for their sample that a repurchase announcement increased the announcing firm's stock price and lowered those of its competitors. The announcement of repurchase programs by competitors mitigated those negative effects. Such clustering does not appear to be driven by market timing.

McNally, W. J., and B. F. Smith. 2011. "A Microstructure Analysis of the Liquidity Impact of Open Market Repurchases." *Journal of Financial Research* 34 (3): 481–501. <https://doi.org/10.1111/j.1475-6803.2011.01299.x>

These authors investigated the effect of open-market repurchase programs on stock liquidity in Canada. The sample consists of 3,726 OMRs in Canada from 1987 to 2005. Repurchase information is from the Toronto Stock Exchange Daily Record as well as trading reports filed by companies with the Ontario Securities Commission. Trading data are from the Securities Trading Access Message Protocol database, and insider trading information is from the Macromedia database and the System for Electronic Disclosure by Insiders database. The authors found that the bid–ask spreads were smaller and depths greater during the repurchase period than during the pre-repurchase period. They also found that the bid–ask spreads were smaller and depths greater on repurchase days than on nonrepurchase days during the program.

Mikkelson, W. H., and R. S. Ruback. 1991. "Targeted Repurchases and Common Stock Returns." *Rand Journal of Economics* 22 (4): 544–61. <https://doi.org/10.2307/2600988>

The authors studied the impact of privately negotiated repurchases on overall shareholder welfare. The sample consists of 111 privately negotiated repurchases in the United States between 1980 and 1983. The data sources are the Wall Street Journal Index and the firms' 13D filings. The authors argue that the commonly reported finding that the market reacts negatively to the announcement of a privately negotiated repurchase does not necessarily imply that such repurchases lower shareholder welfare. They document that most privately negotiated repurchases involve large blockholders. As a result, the stock price reaction may be the result of the reduced monitoring stemming from fewer blockholders rather than a reaction to the repurchases themselves.

Miller, M. H., and K. Rock. 1985. "Dividend Policy under Asymmetric Information." *Journal of Finance* 40 (4): 1031–51. <https://doi.org/10.1111/j.1540-6261.1985.tb02362.x>

These authors propose a model in which dividends are used for signaling when managers know more about the firm's future earnings than outside investors know.

Moser, W. J. 2007. "The Effect of Shareholder Taxes on Corporate Payout Choice." *Journal of Financial and Quantitative Analysis* 42 (4): 991–1020. <https://doi.org/10.1017/S0022109000003471>

This paper reports a study of the relationship between taxes and a firm's ownership structure and corporate payout policy under different tax regimes. The author theorized that, all else being unchanged, a higher (lower) dividend tax penalty, defined as the difference between individual shareholder tax rates on dividend income and long-term capital gains, should make repurchases preferable to dividends as a payout method. The author found that as the dividend tax penalty increases, firms are more likely to repurchase shares than increase dividends. Furthermore, firms with higher levels of ownership by tax-disadvantaged institutional shareholders or a higher proportion of senior managers who own stock in the company are more likely to repurchase shares. These results provide evidence that shareholder taxes influence firms' payout policies.

Nguyen, H. T. H., D. T. Nguyen, and A. H. Pham. 2019. "Three Effects of Stock Repurchase on Rival Firms in Vietnam." *Journal of Economic Development* 21 (1): 57–70.

The authors investigated the effect of a firm's share repurchase announcement on its rivals' stock prices by using a sample of firms in Vietnam from 2010 to 2017 from the StoxPlus Corporation. They found that both the announcing firm and its rivals experience positive and significant cumulative abnormal returns after the repurchase announcement. They also document that the positive effect is stronger when rival firms are more profitable. The authors posit that the repurchase announcement signals undervaluation of the industry.

Nohel, T., and V. Tarhan. 1998. "Share Repurchases and Firm Performance: New Evidence on the Agency Costs of Free Cash Flow." *Journal of Financial Economics* 49 (2): 187–222. [https://doi.org/10.1016/S0304-405X\(98\)00022-1](https://doi.org/10.1016/S0304-405X(98)00022-1)

The authors studied the relationship between repurchase tender offers and subsequent firm performance. They analyzed data on US firms from a previous work by Comment and Jarrell (1991) and the Wall Street Journal Index and data from Compustat and CRSP. They document improved operating performance only among low-growth firms; the improvements come from a general downsizing of the firm that involves the sale of assets and a more efficient use of remaining assets. The authors argue that the positive announcement returns associated with these self-tender

repurchases result from a mitigation of agency problems because of lower free cash flows.

Oded, J. 2005. “Why Do Firms Announce Open-Market Repurchase Programs?” *Review of Financial Studies* 18 (1): 271–300. <https://doi.org/10.1093/rfs/hhh004>

Oded presents a theory of signaling via open-market repurchase programs despite the lack of commitment to buy. According to the theory, the better-quality firms generate payoffs that are higher but also more volatile than other firms. The better-quality firms derive more option value from OMR programs because of the higher volatility in their payoffs. As a consequence, the market infers that a firm is high quality when it announces an OMR program.

Ofer, A. R., and A. V. Thakor. 1987. “A Theory of Stock Price Responses to Alternative Corporate Cash Disbursement Methods: Stock Repurchases and Dividends.” *Journal of Finance* 42 (2): 365–94. <https://doi.org/10.1111/j.1540-6261.1987.tb02572.x>

The authors develop an integrated signaling model in which a privately informed risk-averse manager can signal the true value of the firm via dividends and repurchases. Both types of signal involve costly external financing. Repurchases impose an additional cost on the risk-averse manager by increasing the proportion of the firm owned by the manager. When the firm is only slightly undervalued, the manager finds signaling with dividends optimal. When the firm is highly undervalued, the manager finds signaling with repurchases optimal.

Pastor, L., and R. Stambaugh. 2003. “Liquidity Risk and Expected Stock Returns.” *Journal of Political Economy* 111 (3): 642–85. <https://doi.org/10.1086/374184>

This paper establishes the relationship between expected returns and systematic liquidity risk. The authors propose a liquidity measure that is based on order flow–induced price reversals.

Peyer, U., and T. Vermaelen. 2005. “The Many Facets of Privately Negotiated Stock Repurchases.” *Journal of Financial Economics* 75 (2): 361–95. <https://doi.org/10.1016/j.jfineco.2004.02.003>

Using data on US firms for 1984–2001 from the SDC, CRSP, and Thomson Financial/Lancer Analytics, the authors examined privately negotiated repurchases by US firms. This type of repurchase is usually

initiated by a large seller rather than a firm. The authors considered four categories of privately negotiated repurchases: (1) greenmail, (2) repurchase at a premium, (3) repurchase at a zero premium, and (4) repurchase at a discount. Greenmail repurchases were found to be associated with negative announcement returns, which is consistent with wealth transfers to the seller. Only the second category of repurchases significantly increased total shareholder wealth. The short- and long-run market reactions to this category of repurchases are similar to the market reactions to open-market repurchases. Repurchases in the third category typically involve insiders as sellers. The size of the discount in the fourth category depends on the bargaining power of the firm relative to the large seller with liquidity needs.

Peyer, U., and T. Vermaelen. 2009. "The Nature and Persistence of Buyback Anomalies." *Review of Financial Studies* 22 (4): 1693–745. <https://doi.org/10.1093/rfs/hhn024>

The authors studied buyback anomalies, which involve positive abnormal buy-and-hold returns after buyback announcements. The sample consists of a large number of OMRs in the United States from 1991 to 2001 and 261 repurchase tender offers from 1987 to 2001. Repurchase information is from the SDC database and LexisNexis. Other data sources include Compustat and CRSP. The study confirms that the buyback anomalies first documented in the early 1990s are still present in an updated sample. The authors argue that OMR programs are a response to market overreaction to bad news, resulting in the positive abnormal returns. They also argue that the market misprices the firm following repurchase tender offers because it overestimates the number of shares that will be tendered.

Rau, R., and T. Vermaelen. 2002. "Regulation, Taxes, and Share Repurchases in the United Kingdom." *Journal of Business* 75 (2): 245–82. <https://doi.org/10.1086/338703>

For this study of share repurchase programs in the United Kingdom in the 1985–98 period, the data sources are the SDC, Datastream, and the London Share Price Database. The authors document, first, that corporate payout policy is sensitive to tax law changes. Second, they found an average positive abnormal announcement return that was significantly smaller than that reported in US studies. Furthermore, they found that repurchasing firms earn significant negative abnormal returns (–7%) in the year after announcement of the repurchase intention (these results were mostly driven by agency buybacks). These results are not consistent with the *undervaluation* hypothesis.

Singh, A. K., M. A. Zaman, and C. Krishnamurti. 1994. "Liquidity Changes Associated with Open Market Repurchases." *Financial Management* 23 (1): 47–55. <https://doi.org/10.2307/3666055>

The authors investigated the effects of open-market repurchase announcements on the liquidity of the announcing firm's stock. The sample covers US firms for 1983–1990. Repurchase data are from the Wall Street Journal Index, and company characteristics and trade data are from Compustat and CRSP. The authors document that the market, on average, reacts positively to the announcement of an OMR program. Moreover, they show that OMR announcements tend to follow periods of worsening liquidity (increasing percentage bid–ask spreads) and precede periods of improving liquidity. The changes in the percentage bid–ask spread appear to be driven by the price level.

Sinha, S. 1991. "Share Repurchase as a Takeover Defense." *Journal of Financial and Quantitative Analysis* 26 (2): 233–44. <https://doi.org/10.2307/2331267>

Sinha describes how debt-financed share repurchases can be used as a takeover defense. Debt-financed repurchases motivate the manager to reduce wasteful spending and increase investment in the firm. The result is an increase in the firm's value, making a firm a less attractive takeover target.

Skinner, D. J. 2008. "The Evolving Relation between Earnings, Dividends, and Stock Repurchases." *Journal of Financial Economics* 87 (3): 582–609. <https://doi.org/10.1016/j.jfineco.2007.05.003>

Skinner documents the evolution of payout policies over three decades. The sample is US firms over the 1970–2005 period based on data from Compustat. Stock buybacks have supplanted dividends as the dominant form of payout. The overall level of stock buybacks is primarily determined by earnings, but the timing of stock buybacks depends on a host of other factors.

Stephens, C. P., and M. S. Weisbach. 1998. "Actual Share Reacquisitions in Open-Market Repurchase Programs." *Journal of Finance* 53 (1): 313–33. <https://doi.org/10.1111/0022-1082.115194>

The authors analyzed 450 open-market repurchase programs announced in the *Wall Street Journal* in the 1981–90 period. They propose and discuss the methodological issues of various measures of actual share repurchases. Companies generally repurchase either substantially all or almost none of the shares announced in the three years after the program announcement. Analyzing factors that affect repurchase decisions, the authors found that

actual repurchases are negatively related to the past performance of the stock and positively related to the firm's expected and surprise cash flows.

Straehl, P. U., and R. G. Ibbotson. 2017. "The Long-Run Drivers of Stock Returns: Total Payouts and the Real Economy." *Financial Analysts Journal* 73 (3): 32–52. <https://doi.org/10.2469/faj.v73.n3.4>

The authors studied the predictability of stock returns and show that total payouts, which account for both dividends and share repurchases, predict aggregate stock returns. They also show that total payouts per share grow in line with GDP.

Vermaelen, T. 1981. "Common Stock Repurchases and Market Signalling: An Empirical Study." *Journal of Financial Economics* 9 (2): 139–83. [https://doi.org/10.1016/0304-405X\(81\)90011-8](https://doi.org/10.1016/0304-405X(81)90011-8)

Vermaelen tested several hypotheses on share repurchases: signaling, dividend or personal taxation, leverage, and bondholder expropriation. He found that tender offer and open-market repurchase announcements are followed by permanent increases in stock price. He argues that the most plausible explanation of abnormal announcement return is the *signaling* hypothesis.

von Eije, H., and W. L. Megginson. 2008. "Dividends and Share Repurchases in the European Union." *Journal of Financial Economics* 89 (2): 347–74. <https://doi.org/10.1016/j.jfineco.2007.11.002>

Using data on share repurchase programs for 15 markets in the European Union from the Worldscope database, the authors studied the evolution of payout policies in the EU in the 1989–2005 period. Payout policies of EU firms are similar to those of US firms in many respects. As in the United States, share repurchases experienced rapid growth in popularity among EU firms as a payout method in the sample period. The authors document that the reporting frequency of EU companies has steadily increased and is associated with higher dividends and share repurchases. Interestingly, comparing payouts by privatized and nonprivatized companies (a dimension that is specific to the EU), the authors found the average amount paid out via dividends and repurchases to be significantly higher for the privatized companies.

Whited, T. M., and G. Wu. 2006. "Financial Constraints Risk." *Review of Financial Studies* 19 (2): 531–59. <https://doi.org/10.1093/rfs/hhj012>

The authors propose a theoretically motivated measure of a firm's financial constraints. They also analyze the asset pricing implications of financial constraints.

Wiggins, J. B. 1994. "Open Market Stock Repurchase Programs and Liquidity." *Journal of Financial Research* 17 (2): 217–29. <https://doi.org/10.1111/j.1475-6803.1994.tb00187.x>

Wiggins investigated the effects of open-market repurchase announcements on the liquidity of the announcing firm's stock. The sample is US firms from 1988 to 1990. Quoted bid–ask spreads are from the Institute for the Study of Security Markets transaction files. Stock price data are from CRSP, and repurchase data are from the Dow Jones News/Retrieval system. The authors found no evidence of an adverse effect on liquidity. In contrast, controlling for changes in the stock price, they document a small but statistically significant decline in the percentage bid–ask spread.



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