

# Payout Policy

Joan Farre-Mensa,<sup>1</sup> Roni Michaely,<sup>2,3</sup> and  
Martin Schmalz<sup>4</sup>

<sup>1</sup>Harvard Business School, Harvard University, Boston, Massachusetts 02163;  
email: jfarremensa@hbs.edu

<sup>2</sup>Samuel Curtis Johnson Graduate School of Management, Cornell University, Ithaca,  
New York 14853; email: rm34@cornell.edu

<sup>3</sup>Interdisciplinary Center (IDC) Herzliya, Herzliya 46150, Israel

<sup>4</sup>Ross School of Business, University of Michigan, Ann Arbor, Michigan 48109;  
email: schmalz@umich.edu

Annu. Rev. Financ. Econ. 2014. 6:75–134

First published online as a Review in Advance on  
October 20, 2014

The *Annual Review of Financial Economics* is  
online at [financial.annualreviews.org](http://financial.annualreviews.org)

This article's doi:  
10.1146/annurev-financial-110613-034259

Copyright © 2014 by Annual Reviews.  
All rights reserved

JEL codes: G30, G32, G35

## Keywords

payout policy, dividends, repurchases

## Abstract

We survey the literature on payout policy, with a particular emphasis on developments in the past two decades. The cross-sectional empirical evidence for the traditional motivations behind firms paying out (agency, signaling, and taxes) is most persuasive with regard to agency considerations. Studies centered on the May 2003 dividend tax cut confirm that differences in the taxation of dividends and capital gains have only a second-order impact on setting payout policy. None of the three traditional explanations can account for secular changes in how payouts have been made over the past 30 years, during which repurchases have replaced dividends as the prime vehicle for corporate payouts. Other payout motivations, such as changes in compensation practices and management incentives, are better able to explain the observed variation in payout patterns over time than the traditional motivations. The most recent evidence suggests that further insights can be gained from viewing payout decisions as an integral part of a firm's larger financial ecosystem, with important implications for financing, investment, and risk management.

## 1. INTRODUCTION

Payout policy is at the core of most questions in corporate finance. How much firms pay out and which vehicle they choose to distribute cash to their shareholders may affect their valuation and investment decisions, can impact how much tax investors pay, and may inform the market about how good the firm is relative to its peers. Market frictions imply that payouts are not simply the residual of operating cash flow net of investments. For example, managers state that they would sometimes forego positive net present value (NPV) projects before cutting dividends (Brav et al. 2005). Thus, payout policy affects investment, with obvious implications not only for firm value, but also for the real economy. Payout policy also affects and interacts with other firm policies. Theories and empirical work on risk management and optimal cash holdings, financing and capital structure decisions, mergers and acquisitions, and management and employee compensation all have conceptual and mechanical links to payout levels. For example, how much firms pay out directly implies how much capital they need to raise, given operating income and investment decisions. In addition to these mechanical links, the reasons for how and why firms pay out yield conceptual insights not only for corporate finance questions, but also for other facets of finance and economics. As imperfect markets, governance problems, incomplete contracts, and other frictions can lead to value-destroying payout choices, understanding what role these respective motivations play in payout policy carries first-order implications for corporate governance, security design, and contract theory, as well as other domains in which these frictions have effects.

We review the academic literature on payout policy, with a particular emphasis on developments in the past two decades. (See Allen & Michaely 2003 and DeAngelo, DeAngelo, and Skinner 2008 for surveys with an emphasis on earlier work.) This is a rich literature and space constraints prevent us from doing full justice to all papers on the topic. We therefore attempt to give a detailed review of some papers, but the main intention is to give a broad view and to draw attention to fruitful avenues of future research.

We start by presenting trends in the level of total payouts and the mix between dividends and repurchases. We then review potential explanations for the cross-sectional and time-series variation we see in the data. The potential explanations are implied by Miller & Modigliani's (1961) framework. The following are key questions: How much should and do firms pay out? Which vehicle should they use: dividends or repurchases? What role do tax considerations play in the choice of payout vehicle and amount? Are agency conflicts between shareholders and managers at the core of corporate payout policy? Do payouts reflect attempts by the firm's insiders to signal firm quality to the market? What role do transactions costs play in how payouts are made? How important is it that firms maintain a stable payout policy over time? Are there other important motivations for payouts that the traditional literature has overlooked?

What do corporations actually do with respect to payout policies? There are several key empirical observations that stand out. (a) Corporate payouts involve large amounts of money and thus imply large wealth transfers in the economy. For example, in 2007, US public firms paid out more than \$767 billion in dividends and repurchases. (b) The mix of forms of payouts has changed dramatically over time. The most significant change in stylized facts over the past few decades is the secular increase of repurchases relative to dividends. Firms have become more inclined to repurchase shares than pay dividends and in the past 10 years, firms have paid out more cash via repurchases than via dividends—in peak years more than twice as much. (c) From the mid-1980s until the early 2000s, the number of public firms paying dividends declined substantially. This trend appears to have reversed in the past 10 years, with an increasing number and share of US public corporations paying dividends again. (d) Large and profitable firms pay much more dividends than risky, growth firms. (e) In recent years, repurchases are more widespread across

firms than dividends. Most dividends are paid by a small number of firms, with roughly half of aggregate dividends paid by only 25 firms. The distribution for repurchases is less concentrated. (f) A robust pattern that has not changed much over the past 90 years and, if anything, has become more pronounced is that corporations reveal a strong commitment to maintain the level of dividends. Dividends are sticky and smoothed over time, particularly among large and profitable firms. In contrast, repurchases are heavily procyclical and are smoothed to a much lesser extent. (g) The market responds positively to payout increases and negatively to payout decreases.

These stylized facts have not escaped the eyes of academic researchers, whose interest is in discerning the reasons that generate the observed patterns of payout choices. Although most of the literature in the twentieth century focused on the effect of taxes on the choice between dividends and repurchases and the effects of agency and signaling motivations on dividend policy, the work of the past decade concentrates more on alternative motivations behind repurchases. An exception is a branch of research investigating the effect of shocks to taxes, such as the 2003 dividend tax cut in the United States. The results indicate that although taxes have some effect on payout policy, they do not seem to be a first-order explanation for the observed variation in payouts, especially at the aggregate level.<sup>1</sup> The accumulated evidence on payout and agency indicates that firms use payouts to reduce potential overinvestment by management. Firms increase their payouts as they mature; and the market “appreciates” more dividends and repurchases paid by firms with more free cash flow. There is less evidence that signaling plays a significant role in dividend policy decisions or in the decision to repurchase shares. Firms do well over long periods prior to large dividend increases and also before repurchases, but there is little indication that they experience surprisingly good outcomes after increases in dividends or after repurchases. In fact, after those events, firms tend to invest less and experience slower growth. (In the short term, downward earnings management before repurchase announcements and a rebound to normal levels afterward may indicate the opposite.) Also, significant evidence has been accumulated to prove that the market reaction to repurchase announcements is not semi-strong form efficient, which casts some doubt on rational signaling explanations for payouts. Furthermore, analyses of new datasets of actual repurchases indicate that, although the announcement of repurchases seems to be robustly related to market undervaluation, the majority of actual repurchases are not driven by market undervaluation. These findings give less credence to the role of signaling in repurchase decisions than was previously believed. Thus, among the traditional motivations for payouts, agency theories enjoy the most robust empirical support.

Although agency theories do a decent job explaining the cross-sectional differences in both the level of dividends and repurchases and the persistence of dividends (i.e., dividend smoothing), none of the traditional stories seems to be able to explain the secular changes in how payouts are made, and especially the dramatic increase in repurchases over the past 30 years. It is not surprising, then, that research has turned toward alternative explanations for why firms pay out, especially in the form of repurchases. One attempt to explain the time series is to examine the power of behavioral theories that argue for time-changing preferences for particular forms of payouts by investors. Mixed empirical support accompanies these efforts. Stronger support comes from the analysis of managers’ compensation contracts. If executives’ compensation depends on earnings per share (EPS), a measure that, all else equal, decreases in the number of shares outstanding, they are more likely to repurchase stock rather than pay out capital through dividends.

---

<sup>1</sup>The evidence that the impact of taxation is second order is not only in the 2003 tax change, but also in the 1986 and 1997 tax changes. All these tax changes reduced the tax advantage of repurchases over dividends but were associated with an increase in repurchase activity relative to dividend.

An interesting interaction exists between EPS-based compensation and employee option compensation: When employees exercise their stock options, EPS measures get diluted. Managers that are compensated based on EPS then have an incentive to undo the dilution by repurchasing shares—possibly with the trade-off of having to give up NPV-positive projects, or having to issue debt to finance the buyback. Strong evidence has been accumulated for these hypotheses in the cross section. As executive and employee stock option exercises dilute EPS, the growth of such compensation practices over time and the cyclicity of option exercise decisions are, to some extent, also potential explanations for the time-series patterns of repurchases over dividends.

What has changed in terms of research methods? The payout literature has innovated in three respects, similar to other literatures in corporate finance. First, researchers have more widely adopted quasi-experiments, e.g., tax changes or discontinuities implied by closely missed earnings forecasts, to “identify” hypothesized effects. Second, researchers have hand-collected new datasets to reinvestigate both previously asked as well as new questions. Examples include interviews with executives that are informative about all aspects of payouts, market data from exchanges around the world to investigate the interaction between trading costs and payout policy, individual transactions data from Scandinavia to investigate the motivations behind ex-dividend-day trading, data on actual repurchases both abroad and in the United States to investigate whether exploitation of mispricing is a major motivation for repurchases, and data on option compensation of employees to test the hypothesis that EPS dilution is an important motivation favoring repurchases. Third, researchers have become quite creative in advancing new “out-of-the-box” hypotheses for payouts and thus providing support for previously unexplored motivations for payouts. This development is partially driven by the widespread availability of newer datasets (e.g., on executive compensation) and partly driven by the inability of existing theories to explain the secular changes in payout policy. These innovations in research style, especially the collection and use of new data sources, are likely to continue to be key drivers of the development of this literature.

Looking back, we note that most of the academic literature has analyzed payout policy in isolation. Part of the reason is a preference for clean so-called identification of causal effects. Techniques that allow for such quasi-experiments necessarily come with limitations as to the external validity of the estimates. As a result, the narrower focus of some of the recent research output limits its ability to address many “big picture” questions that still wait to be addressed. For example, consider the finding that substantial portions of payouts are not motivated solely by the amount of free cash flow firms have at their disposal (discussed in Section 6). Looking forward, we propose that a more holistic view of payout policy be adopted. The benefits of such a broader view would be the contribution of insights from the payout literature to other fields and the use of insights in other fields to improve our understanding of corporate payout policy.

The review proceeds as follows. Section 2 presents stylized facts and trends in payout policy. Section 3 structures the discussion by reviewing the classic Modigliani and Miller framework. Section 4 reviews papers that investigate the role of taxes in the choice of payouts. Section 5 analyzes traditional and newer evidence on signaling and agency theories for payouts. Section 6 discusses alternative motivations for payouts that have been advanced primarily in the past decade. Section 7 concludes with a summary and suggestions for future research.

## 2. RECENT TRENDS IN PAYOUT POLICY

This section surveys papers describing recent trends in payout policy, with an emphasis on developments that have occurred over the past two decades. Specifically, Section 2.1 examines the dividend policies of public US firms, highlighting the decrease in the population of dividend payers

from the late 1970s until the early 2000s and the apparent reversal of this trend over the past decade. Section 2.2 focuses on share repurchases, which have exploded in recent years, and analyzes the extent to which repurchases are substituting dividends as the preferred form of payout. Section 2.3 surveys recent developments in the empirical literature on dividend smoothing. In Section 2.4, we turn our attention to papers that have examined recent trends in the payout policies of public firms outside of the United States and compare these trends to those that have taken place within the United States.

## 2.1. Disappearance and Reappearance of Dividends

In an influential paper, Fama & French (2001) find that the fraction of public US firms paying cash dividends fell from 66.5% in 1978 to 20.8% in 1999. They show that part of this decline was due to a shift in the population of publicly traded firms toward small firms with low profitability and strong growth opportunities—the type of firms that typically do not pay dividends. This change in the population of public firms was driven by an explosion of newly listed firms, with the number of public firms growing from 3,638 in 1978 to a peak of 5,670 in 1997, and by the changing nature of these newly listed firms. Indeed, although newly public firms had always been small firms with high growth opportunities, their average profitability fell markedly during the 1980s and 1990s: Before 1978, newly listed firms were more profitable than seasoned firms, whereas the opposite was true for firms that went public in the 1990s. As a result, the low profitability of these many newly listed firms is part of the reason for the decline in the fraction of dividend-paying firms.

However, Fama & French (2001) note that the shift in the population of public firms toward firms whose characteristics made them unlikely to pay dividends, although important, explains only partially the decline in the incidence of dividend payers from 1978 to 1999. Indeed, they show that, holding firm characteristics constant, firms became less likely to pay dividends during the 1980s and 1990s, and they argue that this effect was at least as important as changing firm characteristics in explaining the decrease in the fraction of dividend-paying firms. (In Section 2.2, we discuss the extent to which this finding can be explained by firms' substituting dividends by share repurchases; see also Grullon & Michaely 2002.)

DeAngelo, DeAngelo & Stulz (2006) provide further evidence consistent with the notion that both changing firm characteristics and a decline in the propensity to pay dividends holding firm characteristics constant played an important role in explaining the decline in the fraction of dividend-paying firms. Building on Grullon, Michaely & Swaminathan's (2002) maturity hypothesis whereby firms pay out more as they mature, DeAngelo, DeAngelo & Stulz (2006) argue that maturity can be proxied by the mix of earned and contributed capital, and they show that this mix has a quantitatively greater impact on the decision to pay dividends than measures of profitability and growth opportunities. They then show that the reduction in the number of dividend-paying firms during the 1980s and 1990s coincided with a massive increase in the number of public firms with negative retained earnings, from 11.8% in 1978 to 50.2% in 2002.

In addition, DeAngelo, DeAngelo & Stulz (2006) show that the trend for firms to be less likely to pay dividends, holding firm characteristics constant, is almost entirely driven by firms whose positive retained earnings have historically made them good candidates to pay dividends. They show that among such firms the magnitude of the reduction in the propensity to pay dividends is approximately 50%, or nearly twice the average magnitude of the reduction estimated by Fama & French (2001) across all firms. They find, however, that the growing group of firms with negative retained earnings showed virtually no change in their (essentially nil) propensity to pay dividends from the mid-1970s to 2002. Overall, these results are consistent with Fama & French's finding that the decline in the fraction of dividend-paying firms through the early 2000s was driven by both

a shift in firm characteristics and a lower propensity of those firms with the typical characteristics of a dividend payer to actually pay dividends.

Did the decline in the number and fraction of dividend-paying public US firms over the 1980s and 1990s imply that dividends themselves were disappearing? Somewhat unexpectedly, Grullon & Michaely (2002) and DeAngelo, DeAngelo & Skinner (2004) show that the decline in the number of dividend-paying firms was actually accompanied by a 22.7% increase in the real dollar amount of dividends paid by industrial firms over the 1978–2000 time period. How could the marked decline in the number of dividend payers be reconciled with this aggregate increase in real dividends? DeAngelo, DeAngelo & Skinner (2004) argue that the answer is twofold. First, the large reduction in the number of dividend payers occurred almost entirely among firms that paid very small dividends. As a result, the loss of these firms' dividends had a minor impact on the aggregate supply of dividends. Second, this reduction in the number of dividend payers was accompanied by a simultaneous substantial increase in the dividends paid by the largest payers, reflecting a sizeable increase in their real earnings. In sum, DeAngelo, DeAngelo & Skinner (2004) show that the increase in real dividends paid by firms at the top of the dividend distribution swamped the dividend reduction associated with the loss of many small payers at the bottom. At the same time, as pointed out by Grullon & Michaely (2002), the aggregate increase in earnings during this time period significantly outpaced the increase in dividends, resulting in a marked decline in the dividend payout ratio and the dividend yield.

Importantly, DeAngelo, DeAngelo & Skinner (2004) also note that these two trends led to increasingly high dividend concentration in the US, to the point that the 25 largest dividend payers, all of which were old-line established firms, collectively supplied 54.9% of aggregate industrial dividends in 2000. This dividend concentration reflected earnings themselves being highly concentrated, with the 25 top dividend payers generating 51.4% of aggregate industrial earnings in 2000.

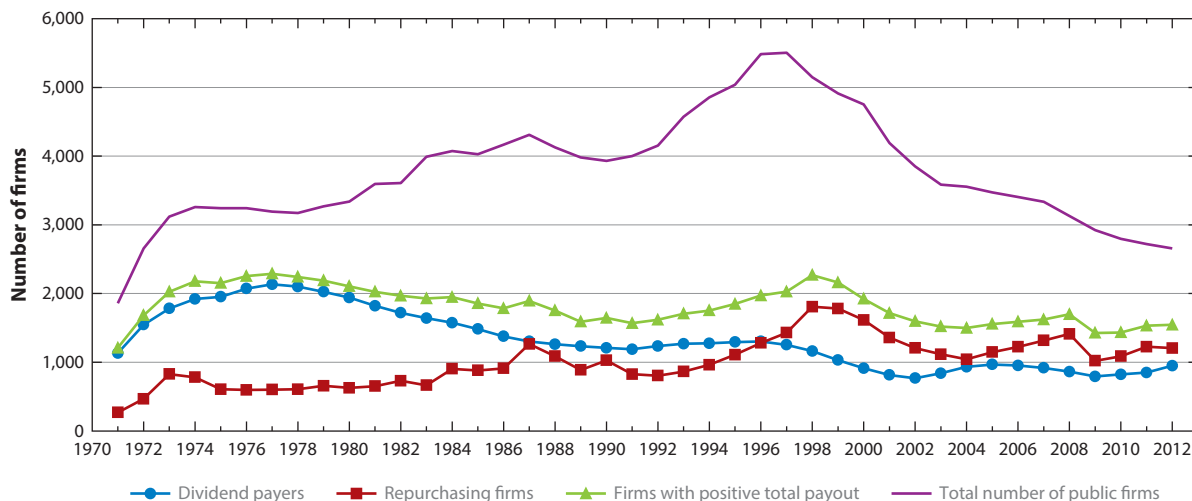
Fama & French (2001) end their study in 1999, Grullon & Michaely (2002) in 2000, and DeAngelo, DeAngelo & Skinner (2004) in 2002. A natural question then emerges: Has the decline in the number and fraction of dividend-paying firms continued over the past decade? As it turns out, it has not. Julio & Ikenberry (2004) provide the first hint of a reversal in this decline and note that dividends might be reappearing. Farre-Mensa, Michaely & Schmalz's (2014) analysis shows that this reappearance of dividends has gained steam after the population of dividend payers bottomed out in 2002. As shown in **Figure 1**, the number of dividend-paying firms increased from 767 in 2002 to 968 in 2005, a 26% increase, and it appears to be growing again after briefly decreasing during the 2008–2009 financial crisis, standing at 949 in 2012.<sup>2</sup>

**Figure 2** shows that the reappearance of dividends is even more pronounced if we measure the fraction of dividend-paying firms as a share of the total number of US public firms. This is because the number of publicly traded firms in the United States has continued its steep decline since peaking at more than 5,500 in 1997: The number of public firms in 2012 stood at less than 2,700, a decrease of more than 50% since its peak. As a result, the fraction of dividend-paying firms in 2012 reached 35%, a level not seen since 1985, after being below 20% from 2000 to 2002.

What explains this reappearance of dividends? **Figure 2** suggests that the increase in the fraction of dividend-paying firms among the population of public US firms has been boosted by the delisting or bankruptcy of many of the dot-com firms that went public during the 1990s, most of which never paid dividends. But **Figure 1** also shows that the decline in the absolute number of

---

<sup>2</sup>Following the literature, utilities (SIC 49) and financial firms (SIC 6) are excluded from all figures. Also, we focus on common dividends and exclude preferred dividends. For details on our sample construction and variable definitions, see **Figure 1**.



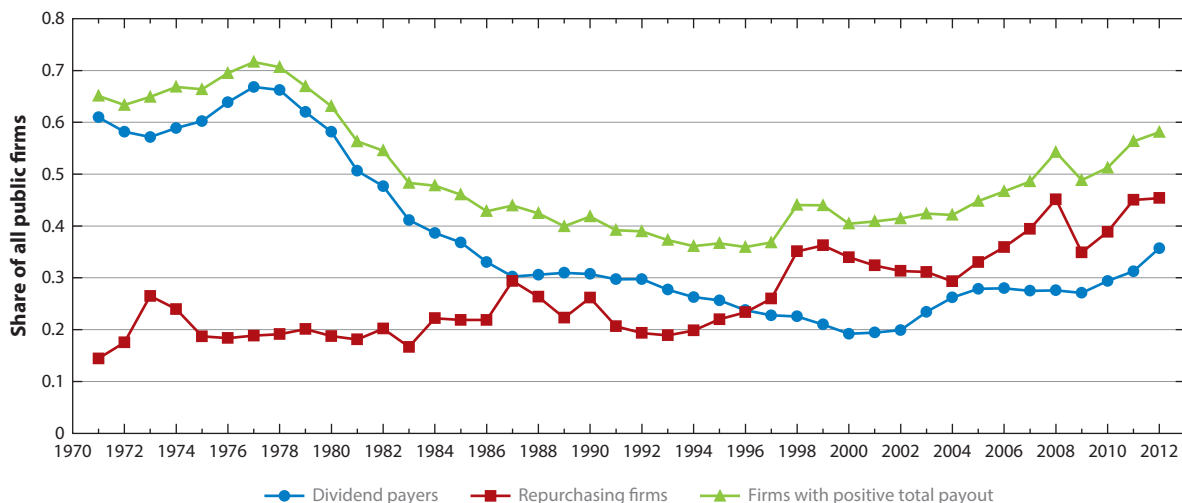
**Figure 1**

This figure shows how the number of publicly listed payout-paying firms has evolved in the United States from 1971 through 2012. To be part of our public-firm sample, a firm has to be in both Compustat and the Center for Research in Security Prices (CRSP); be incorporated and located in the United States; be listed on the NYSE, AMEX (American Stock Exchange), or NASDAQ; have valid stock prices in CRSP; have a CRSP share code of 10 or 11 (which screens out nonoperating entities such as real estate investment trusts, mutual funds, or closed-end funds); and be neither a financial firm (SIC 6) nor a regulated utility (SIC 49). We define dividend payout as the total dollar amount of dividends declared on the common stock during the fiscal year (Compustat item *div*). Repurchase payout is the total expenditure on the purchase of common and preferred stocks (Compustat item *prstk*) minus any reduction in the redemption value of the net number of preferred shares outstanding (Compustat item *pstkrv*). Total payout is the sum of dividend and repurchase payout. A firm is a dividend payer if the dollar amount paid out via dividends exceeds \$100,000 (where \$ denotes real 2012 US dollars). A firm is a repurchasing firm if the dollar amount paid out via share repurchases exceeds \$100,000. A firm has positive total payout if its total payout exceeds \$100,000.

dividend-paying firms that began in the late 1970s appeared to start reversing itself in 2003, coinciding with the enactment of the Jobs and Growth Tax Relief Reconciliation Act of 2003 (JGTRRA) that cut the top dividend tax rate from 35% to 15% (referred to herein as the 2003 dividend tax cut), thus eliminating the tax rate disadvantage of dividends relative to capital gains. Numerous papers, which we discuss in Section 4, examine the role that the 2003 dividend tax cut played in explaining this reversal. The upshot of this discussion is that the jury is still out regarding the extent to which the reappearance of dividends was driven by the 2003 dividend tax cut. That said, the fact that a similar reappearance appears to be taking place in other countries that have not experienced changes in the taxation of dividends (cf. Section 2.4) suggests that taxes alone might not fully explain the reappearance of dividends over the past decade.

Figure 3 confirms Grullon & Michaely's (2002) and DeAngelo, DeAngelo & Skinner's (2004) finding that the aggregate dividends paid by public US firms have experienced an almost monotonic increase over the past four decades: In 2012, industrial public US firms paid more than \$258 billion in dividends, whereas in the early 1970s aggregate dividends were approximately 70 billion of real 2012 dollars. Figure 4 examines the evolution of the average dividend payout ratio (i.e., the ratio of dividends to earnings) over the past four decades. Interestingly, the reappearance of dividends is also noticeable here: Although the dividend payout ratio was on a downward trend through the 1970s, 1980s, and 1990s, bottoming out at 7.2% in 2000, it has followed an upward trend since then, reaching 14.7% in 2012, a level not seen since the mid-1980s.





**Figure 2**

This figure shows the fraction of dividend-paying firms, repurchasing firms, and firms with positive total payout in our sample of publicly listed US firms. For details on our sample construction and variable definitions, see **Figure 1**.

In addition, **Figure 5** shows that the trend toward an increasing concentration in dividends peaked in 2005, when the 25 largest dividend payers collectively supplied just under 63% of aggregate industrial dividends, and has been steadily declining since 2009. In 2012, the last year for which we have data available, the top 25 dividend payers paid 48% of aggregate industrial dividends, in line with the share they paid from the 1970s until dividend concentration started to increase markedly in the mid-1990s.

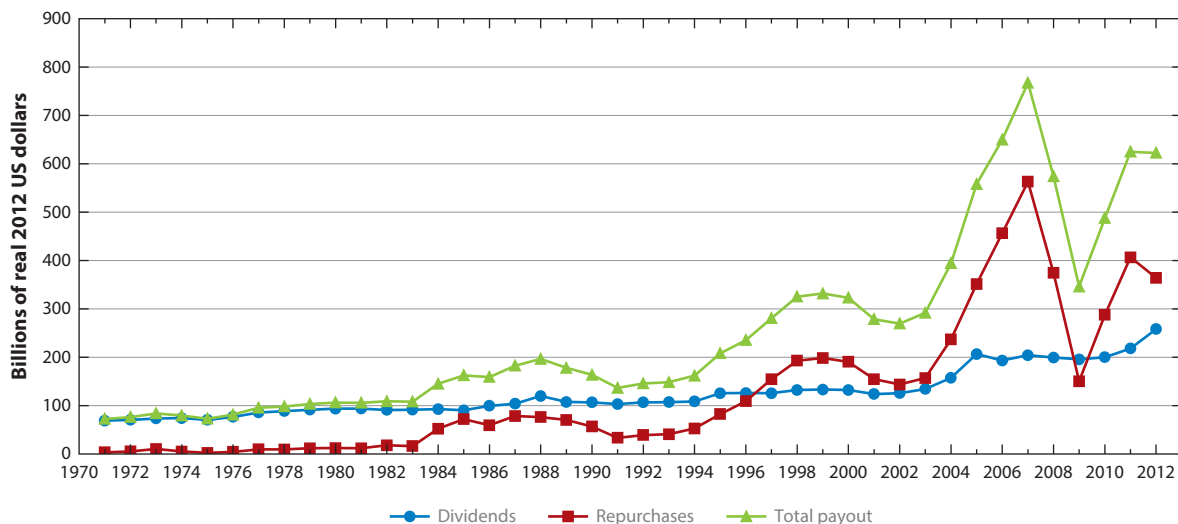
Interesting as the dividends trends captured by **Figures 1–5** are, perhaps the most noteworthy development illustrated by these figures is the explosion in share repurchase activity over the past three decades. This is the focus of the next section.

## 2.2. Explosion of Share Repurchases and the Choice Between Dividends and Repurchases

Share repurchases are an increasingly important component of payouts: **Figures 1 and 2** show that the number and particularly the fraction of firms choosing to return cash to their shareholders by repurchasing shares have increased substantially since the early 1980s. The first year that the number of firms repurchasing their shares surpassed the number of dividend payers was 1997, and repurchases have been the most popular form of payout since. The fraction of public US firms engaging in share repurchases was highest in 2012 (the last year of our sample period) at more than 45%, compared to less than 20% in 1980.

Similarly, **Figure 3** shows that the aggregate dollar volume of share repurchases has surpassed that of dividend payments in all but one year since 1997 (the exception being 2009), and **Figure 4** shows that the same is true for the average repurchase payout ratio (i.e., the ratio of repurchases to earnings). Aggregate share repurchases peaked in 2007 at more than 560 billion of real 2012 dollars, constituting more than 73% of total dollars paid out by public US firms that year. After falling sharply during the Great Recession, repurchases have since recovered and in 2012 the aggregate dollar volume of shares repurchased was \$364 billion, representing 58% of total





**Figure 3**

This figure shows the aggregate dollar amount of dividends, share repurchases, and total payouts (the sum of dividends and share repurchases) paid out by our sample of publicly listed US firms. For details on our sample construction and variable definitions, see Figure 1. All magnitudes are in billions of real 2012 US dollars of purchasing power.

payouts. Interestingly, Figure 5 shows that the explosion in the aggregate dollar volume of repurchases over the past decade has not been driven by a few large repurchasers: The aggregate dollar volume of repurchases appears to be negatively correlated with the share of repurchases made by the top 25 repurchasers, suggesting that it is the extensive rather than the intensive margin that is the main driver of aggregate repurchase activity.

As a result of the increase in the dollar volume of repurchases and, to a lesser extent, in the volume of dividends, aggregate total payouts by public US firms have sharply increased over the past four decades, growing from less than 100 billion of real 2012 dollars in the 1970s to more than \$600 billion in 2012 (cf. Figure 3). The fraction of public firms paying out capital to their shareholders (in the form of dividends or share repurchases) stood at 58% in 2012, still below the 72% mark reached in 1977 but well above the 37% low point reached in 1997 (cf. Figure 2).<sup>3</sup> The total payout ratio, however, stood at 28.7% in 2012, its highest level since the beginning of our sample period in 1971 and well above the 15.4% low point reached in 1996 (cf. Figure 4).

The growing importance of repurchases made apparent by Figures 1–4 was already noted by Grullon & Michaely (2002), who argue that this increase in repurchase activity was at least partially financed with funds that otherwise would have been used to increase dividends. Specifically, Grullon & Michaely show that, by 2000, repurchases had become the preferred form of initiating a cash payout for new payout payers. In addition, established dividend payers had

<sup>3</sup>Figures 1–5 follow Grullon & Michaely (2002) and focus on gross share repurchases instead of repurchases net of share issues. This allows us to most directly compare (gross) dividends and repurchase activity. Alternatively, if one wants to analyze net cash disbursements to equityholders, it is useful to focus on the dollar volume of dividends plus repurchases net of equity issues. Grullon et al. (2011) do precisely this. They find that the fraction of firms that are net payers of capital to their shareholders dropped from approximately 63% in the 1970s to 30% in the 2000s. However, after controlling for firm characteristics, they show that firms are as likely to be net payers in the 2000s as in the 1970s.

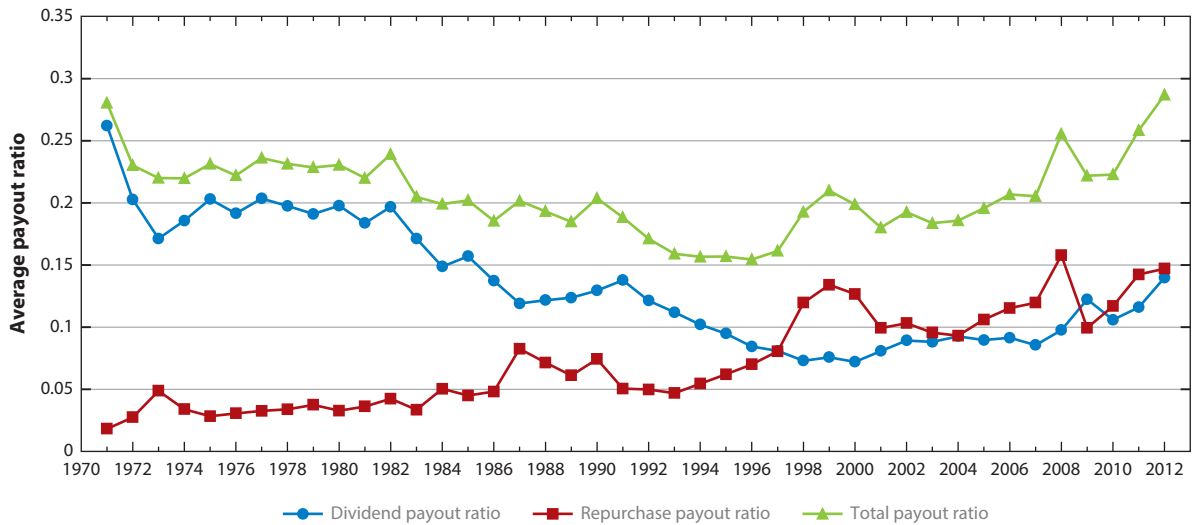


Figure 4

This figure shows the equal-weighted average dividend payout ratio, repurchase payout ratio, and total payout ratio for our sample of publicly listed US firms. We define the dividend, repurchase, and total payout ratio as the ratio of dividends, share repurchases, and total payouts to earnings (Compustat item *ib*), respectively. We exclude firms with nonpositive earnings as well as observations with a total payout ratio greater than one. For details on our sample construction and variable definitions, see Figure 1.

also increased their use of repurchases, though they had mostly avoided cutting their dividends; rather, they simply increased their dividends by less than they would have otherwise.

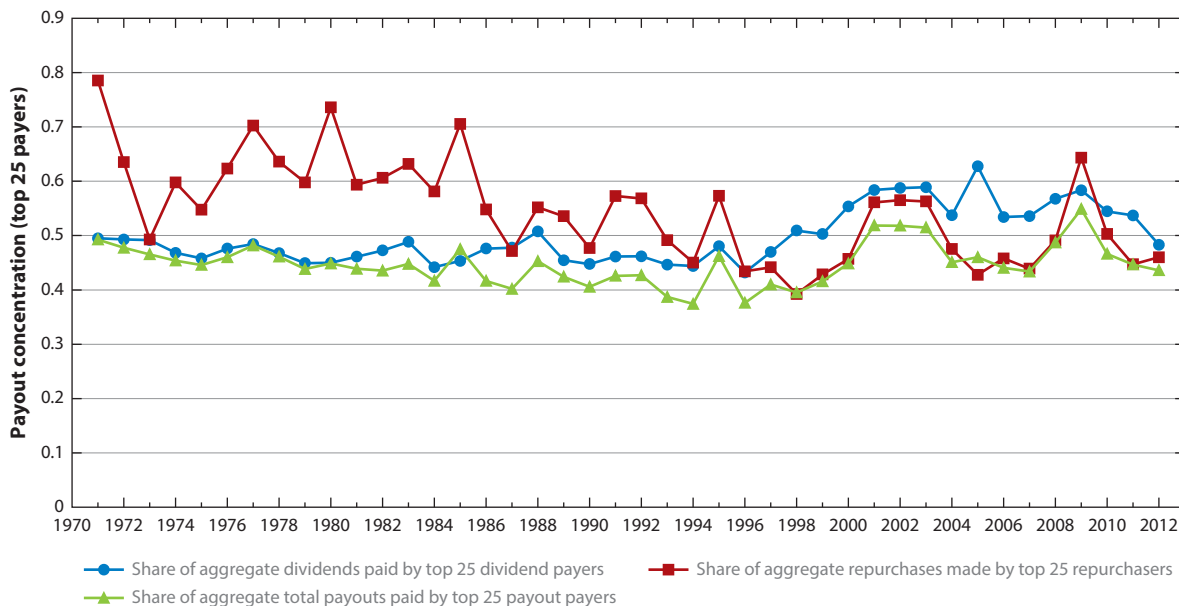
As Grullon & Michaely (2002), and many others, argue, there has long been an obvious incentive for firms to use share repurchases as a substitute for dividends due to the tax advantage of capital gains relative to dividends, particularly before the 2003 dividend tax cut.<sup>4</sup> Firms have been shown to respond to this incentive: In periods in which the dividend tax penalty increases, firms are more likely to distribute cash to shareholders through share repurchases than through dividends (see, e.g., Sarig 2004, Moser 2007).<sup>5</sup> This raises an important question: Why did firms not repurchase more intensely before the mid-1980s when, particularly before the Tax Reform Act of 1986 (TRA), the dividend tax penalty was much higher than it was in later decades?

Grullon & Michaely (2002) argue that before the Securities and Exchange Commission (SEC) adopted Rule 10b-18 in 1982, the risk of violating the antimanipulative provisions of the Securities Exchange Act of 1934 deterred most firms from repurchasing shares in the open market. Consistent with this argument, Grullon & Michaely show that repurchase activity experienced an upward structural shift soon after the adoption of Rule 10b-18 clarified what conditions repurchasing firms needed to meet to avoid being accused of engaging in share price manipulation.

A few years after Grullon & Michaely's (2002) study, Skinner (2008) shows that repurchases have already become the dominant form of payout, being increasingly used in place of dividends, even in the case of those firms that continue to pay dividends. Skinner points out that three principal groups

<sup>4</sup>The 2003 dividend tax cut equalized the individual tax rates for qualified dividends and long-term capital gains. This reduced, but did not eliminate, the tax advantage of share repurchases relative to dividends, because realized gains resulting from share repurchases are taxed net of basis (deferral tax advantage) and can also be timed (see, e.g., Chetty & Saez 2005).

<sup>5</sup>Moser (2007) also shows that the relation between the dividend tax penalty and corporate payout choice is affected by the tax status of the shareholders who own stock in the firm.



**Figure 5**

This figure shows, for each year, the fraction of aggregate dividends, share repurchases, and total payouts paid by the 25 industrial firms with the largest dividend payout, repurchase payout, and total payout that year, respectively. For details on our sample construction and variable definitions, see **Figure 1**.

of payout payers have emerged: firms that pay dividends and also make regular repurchases, firms that make regular repurchases only, and firms that make occasional repurchases only. This also indicates that firms that only pay dividends are increasingly rare. That said, as shown in **Figure 1**, there continues to be a nontrivial number of payout payers for which dividends are their only form of payout (in 2012, dividend-only payers constituted just under 22% of all payout payers).

In light of these findings, should we expect share repurchases to completely replace dividends in the years to come? Although this is a possibility, the most current evidence suggests that neither firms nor investors view dividends and repurchases as perfect substitutes. Indeed, Guay & Harford (2000) and Jagannathan, Stephens & Weisbach (2000) note that firms choose dividend increases to distribute relatively permanent operating cash flow shocks, whereas they use repurchases to distribute transient, often nonoperating cash flow shocks. More recently, Lee & Rui (2007) use a time-series vector autoregression analysis to show that share repurchases are associated with temporary components of earnings, whereas dividends are not. Consistent with these findings, Koch & Sun (2004) show that changes in dividends cause investors to revise their expectations about the persistence of past earnings changes, an effect that varies predictably with the magnitude of the dividend change and the sign of the past earnings change.<sup>6</sup> This is consistent with the well-documented fact that the market tends to react positively to announcements of dividend increases and negatively to announcements of dividend decreases (see, e.g., Pettit 1972; Charest 1978; Aharony & Swary 1980; Michaely, Thaler & Womack 1995).

<sup>6</sup>Amihud & Li (2006), however, argue that the rise in holdings by institutional investors, which tend to be more sophisticated and informed than retail investors, has led to a decline in the information content of dividend announcements, which has reduced the propensity of firms to use dividends as a costly signal.

That said, Grullon & Michaely (2002) also find a positive market reaction to the announcement of share repurchases. In addition, they show that the market reaction to the announcement of dividend decreases is less negative for repurchasing firms than for nonrepurchasing firms. Taken together, these findings suggest that, although dividends and repurchases are not perfect substitutes, there is a nontrivial degree of substitution between the two forms of payout. But to what extent and under which circumstances do firms and the market treat dividends and share repurchases as substitutes? These are important questions and promising avenues for future research.

If dividends are indeed used to distribute earnings that firms see as permanent whereas repurchases are used to distribute more transient earnings, then we would expect firms to pay smooth dividends and be more flexible with their repurchases. The empirical evidence supports the prediction that share repurchases are more flexible than dividends. In fact, we can think of the flexibility of repurchases as having two components: First, unlike in the case of (regular) dividends, that a firm repurchases shares in a given year does not create the expectation that the firm will repurchase a similar amount of shares in the following year (see, e.g., Jagannathan, Stephens & Weisbach 2000). In addition, firms announcing a repurchase program often do not actually fulfill this program. Stephens & Weisbach (1998) find the completion rate for repurchase programs to be between 70% and 80%, and there is little evidence of a reputational penalty for those firms failing to follow through with their announced repurchase programs (Jagannathan, Stephens & Weisbach 2000).<sup>7</sup>

In recent work, Bonaimé, Hankins & Harford (2014) go a step further and argue that both risk management and payout decisions affect a firm's financial flexibility. Consistent with the notion that financial flexibility in payout decisions and hedging are substitutes, they find that a more flexible distribution policy, favoring repurchases over dividends, is negatively related to financial hedging within a firm. They argue that this finding suggests that payout flexibility offers operational hedging benefits.

The evidence in **Figures 1–3** is consistent with the idea that repurchases are more flexible than dividends: The figures show that both the number and fraction of dividend-paying public firms and the aggregate dollar magnitude of dividends are much less volatile than in the case of repurchases. In particular, **Figure 3** indicates that repurchases (and, consequently, total payouts) are heavily procyclical, a point already noted by Jagannathan, Stephens & Weisbach (2000), and the business cycle appears to have little effect on the aggregate amount of dividends paid out. The next section builds on this suggestive macro evidence by reviewing the literature on dividend smoothing.

### 2.3. Dividend Smoothing

That dividends are smooth has been known for a long time: In his classic study, Lintner (1956) finds that dividend smoothing behavior is widespread. Specifically, he investigates the dividend policies of 28 public US firms over seven years (1947–1953), including interviews with their management teams. He notes that his sample firms are primarily concerned with the stability of dividends, as managers appear to strongly believe that the market puts a premium on firms with

---

<sup>7</sup>Bargeron, Kulchania & Thomas (2011) show that firms can give up this second level of flexibility by using accelerated share repurchases (ASRs), which are credible commitments by firms to repurchase shares immediately. They find that ASR announcements are associated with positive average abnormal stock returns, even when the announcements happen after or at the same time as repurchase program announcements, which suggests that the market rewards firms for the lost flexibility. Bargeron, Bonaimé & Thomas (2014) find some evidence that repurchase authorizations increase the expectation of subsequent repurchase programs at least to an extent.

a stable dividend policy. As a result, firms do not set dividends *de novo* each quarter. Instead, they first consider whether they need to make any changes to their latest dividend per share, with earnings being the most important determinant of any dividend changes.<sup>8</sup> Only when they have decided that a change is necessary do they consider how large it should be.

In their survey of 384 US financial executives conducted 50 years after Lintner's study, Brav et al. (2005) continue to find evidence consistent with the notion that public-firm managers consider maintaining stable dividends a top priority. Indeed, they note that executives talk about selling assets, laying off employees, borrowing heavily, or bypassing positive NPV projects to avoid having to cut dividends.

If anything, dividend smoothing appears to be increasing. Leary & Michaely (2011) document a steady and substantial increase in the degree of dividend smoothing among public US firms since the early 1930s. In addition, they show that, although the use of repurchases may have contributed to this trend in the past two decades, most of the increase in smoothing occurred before the use of repurchases became widespread (see **Figure 6**). Using both panel regressions that control for firm characteristics and a constant-firm subsample, they show that the increase in dividend smoothing cannot be attributed to the changing nature of publicly traded firms over time.

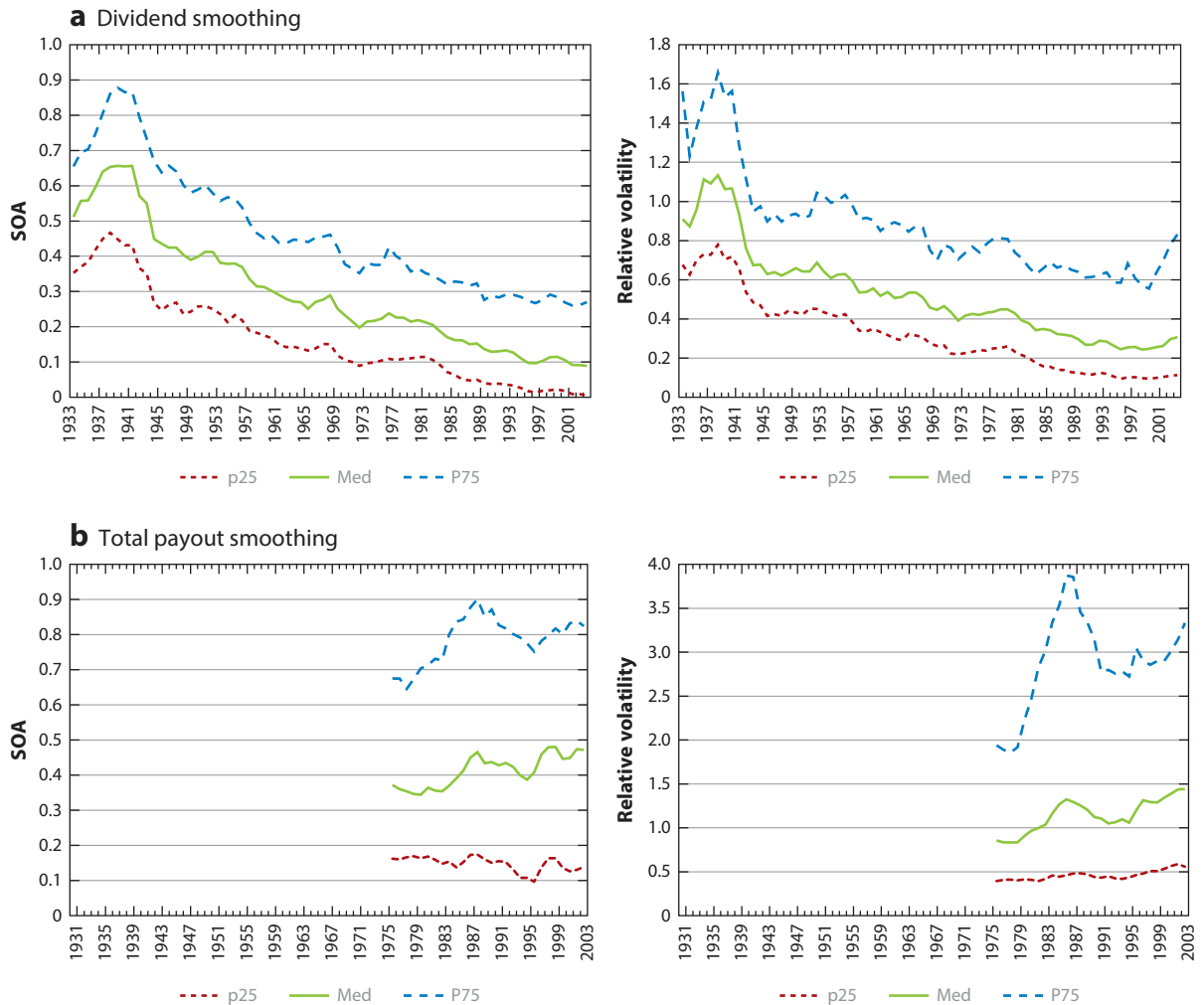
Leary & Michaely (2011) also document significant cross-sectional variation in dividend smoothing and an even greater cross-sectional variation in total payout smoothing. Furthermore, they show that smoothing behavior varies systematically with proxies for many of the market frictions previously linked to payout policy. Most notably, the authors find that information asymmetry proxies tend to be negatively correlated with smoothing: Younger firms, smaller firms, firms with low dividend yields, firms with high earnings volatility and return volatility, as well as firms with less analyst following and with more dispersed and less accurate analyst forecasts all smooth less. [In related evidence, Aivazian, Booth & Cleary 2006 find that firms with a bond rating pay substantially smoother dividends than firms without a bond rating that rely exclusively on private (bank) debt.] As noted by Leary & Michaely, this evidence presents a challenge for theories of smoothing based on signaling motivations. (See Kumar 1988 and Guttman, Kadan & Kandel 2010 for examples of such theories, which we discuss in Section 5.3.)

However, consistent with Easterbrook's (1984), Jensen's (1986), and Allen, Bernardo & Welch's (2000) models discussed in Section 5.3, Leary & Michaely (2011) find that firms that smooth dividends the most are those most likely to be subject to agency costs of free cash flow: firms that are more mature (as measured by their size and age), more likely to be cash cows, and have fewer investment opportunities (as measured by their market-to-book value). This evidence appears most consistent with a link between agency conflicts and smoothing.

Interestingly, Michaely & Roberts (2012) show that the tendency of public firms to smooth dividends does not extend to their private counterparts. Using data from the United Kingdom, Michaely & Roberts note that private firms smooth dividends significantly less than public ones. Their analysis indicates that, in contrast to public firms, the dividend policy of private firms, especially those with highly concentrated ownership, resembles that of a residual financing decision, with the dividend decision occurring after the investment decision. This finding is consistent with the notion that agency considerations play an important role in explaining public firms' smoothing behavior, as in private firms (particularly in those with concentrated ownership) there is virtually no separation between ownership and control and thus no scope for agency problems to

---

<sup>8</sup>On the basis of his interviews, Lintner (1956) reported a median target payout ratio of 50%. Despite his very small sample and the study being conducted more than 50 years ago, this target payout ratio is rather close to the average ratio that several authors have subsequently found for US industrial firms over much longer time periods (see, e.g., Allen & Michaely 2003).



**Figure 6**

Time trends in smoothing behavior. (a) Dividend smoothing. (b) Total payout smoothing. Source: Leary & Michaely (2011). Data are from Moody's Industrial Manuals and Compustat. A separate sample is constructed for each rolling 10-year period starting in 1928, consisting of firms in the CRSP universe with at least eight years of earnings and positive dividend data during the period, excluding financial firms. Years on the horizontal axis label the midpoint of each sample period. The two plots in panel *a* report the median and first and third quartiles of SOA and relative volatility, respectively, for each period. SOA is the speed of adjustment from the partial dividend adjustment model of Lintner (1956), estimated using a two-step procedure in order to improve the precision of the estimates. Specifically, Leary & Michaely (2011) first estimate the target payout ratio as the firm's median payout ratio over the sample period. Using that estimated target, they then compute the deviation from target for each period. Finally, SOA is defined as the estimated coefficient on the deviation from target when the actual dividend change is regressed on this deviation. To construct the relative volatility measure, Leary & Michaely first generate a scaled earnings series, defined as the firm's median payout ratio times each year's earnings. They then fit a quadratic time trend to both the split-adjusted dividend and the scaled, split-adjusted earnings series, and define relative volatility as the ratio of the root mean square errors from these two regressions. Panel *b* repeats the exercise of panel *a*, substituting the sum of common dividends and common share repurchases for dividends. Abbreviations: CRSP, Center for Research in Security Prices.

arise (Jensen & Meckling 1976). That said, Michaely & Roberts also note that there appears to be something inherent in the public capital markets that motivates publicly listed firms to smooth their dividends above and beyond what traditional frictions such as agency conflicts would predict.

Are Michaely & Roberts' (2012) findings regarding payout behavior of UK firms applicable to the United States? Unlike in the United Kingdom, the vast majority of private US firms are not required to publicly disclose their financial statements,<sup>9</sup> and so no large-sample study has focused on comparing the dividend policies of public and private US firms. As far as public firms are concerned, the existing evidence suggests that the payout policy of UK public firms has gone through similar trends to those we have described so far for public US firms. We review this international evidence in the next section.

There are other unresolved issues related to smoothing. For example, although it is almost an article of faith that managers have a preference for smooth dividends, there is no evidence that investors prefer it. Larkin, Leary & Michaely (2014) study whether investors indeed value dividend smoothing stocks differently by exploring the implications of dividend smoothing for firms' stock prices and cost of capital. They find no robust relationship between the smoothness of a firm's dividends and the expected return, or market value, of its stock. Clearly, the lack of evidence that smoothing dividends enhances stock price or reduces the cost of equity capital makes the prevalence of this policy somewhat puzzling.

## 2.4. International Trends in Payout Policy

Several recent papers have analyzed the payout policies of non-US firms and compared them to the trends in the payout policies of US firms described above. Overall, there is a general sense that payout policies around the world have been subject to largely similar dynamics to those experienced by US firms.

Denis & Osobov (2008) examine public firms' propensity to pay dividends in Canada, the United Kingdom, Germany, France, and Japan over the 1989–2002 period. In these five countries, as in the United States, the cross-sectional propensity to pay dividends is higher among larger and more profitable firms, as well as among those firms for which retained earnings comprise a larger fraction of total equity. Also in line with the US evidence presented by DeAngelo, DeAngelo & Skinner (2004), Denis & Osobov show that aggregate dividends in these five countries have not declined and are concentrated among the largest, most profitable firms.

There is also some evidence of a declining trend in the propensity to pay dividends in these five countries, particularly among newly listed firms that appear to fail to initiate dividend payments when, according to their characteristics, in the past they would have been expected to do so. That said, the robustness and strength of this evidence appears to vary by country. The decline is particularly strong in the case of Japan, where it is driven both by dividend abandonments and by the failure of existing nonpayers to initiate dividends. It is also significant in the case of the United Kingdom, where Ferris, Sen & Yui (2006) find a declining propensity to pay dividends after controlling for firm size and profitability. Specifically, Ferris, Sen & Yui report that the fraction of UK firms listed on the London Stock Exchange that are dividend payers fell from nearly 76% in 1988 to 54.5% in 2002 (the last year of their sample), with much of the decline occurring from

---

<sup>9</sup>The rare exception is private US firms that are required to file their financial statements with the SEC. These are private firms meeting one of the following two requirements: (a) They have \$10 million or more in assets and 500 or more shareholders [2,000 shareholders after the passage of the JOBS (Jumpstart Our Business Startups) Act in April 2012], or (b) they have issued public debt.



1998 to 2002. In contrast to Denis & Osobov (2008), who point to agency theories of payout policy as those most consistent with their findings, Ferris, Sen & Yui attribute the shift in the dividend policies of UK firms to a change in catering incentives in the UK equity market.

von Eije & Megginson (2008) broaden the scope of Denis & Osobov's (2008) analysis to the 15 nations that were members of the European Union (EU15) before May 2004 and extend the sample period to 2005. They continue to find similar trends to the ones described in the previous section for the United States. Indeed, as illustrated by **Figure 7**, von Eije & Megginson find that, from 1989 to 2005, the fraction of dividend-paying public firms declined steadily across the EU15, with the decline being most pronounced in the United Kingdom (from 92% in 1989 to 42% in 2005) and in Germany (from 84% in 1991 to under 40% in 2004). They point to the rapid increase in the number of companies going public via the UK's Alternative Investment Market and Germany's Neuer Market as a likely driver of this decline. **Figure 7** also indicates that, in all countries or regions except the United Kingdom, the fraction of dividend-paying public firms appeared to bounce back around 2003–2004, a pattern similar to the one we have described for the United States in Section 2.1. The lack of major EU15 dividend tax changes during this period suggests that the improving economic outlook after 2003 might be the most likely explanation for this rebound. However, more research is needed to determine whether this reappearance of dividends in the EU15 has continued after 2005 as well as the causes that might be driving it.

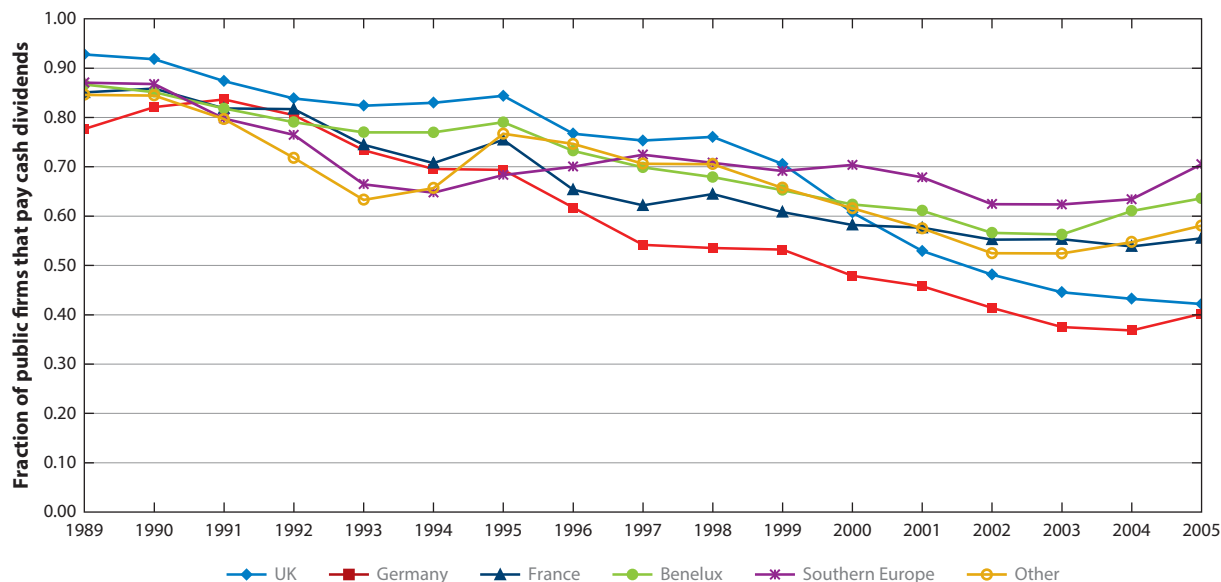
von Eije & Megginson (2008) also show that, again as in the United States, the aggregate real dollar amount of dividends paid out by EU15 public firms increased substantially during the 1989–2005 time period. Specifically, **Figure 8** shows that total real (in 2000 terms) dividends paid by EU15 listed firms increased modestly from €35 billion in 1989 to €42 billion in 1994, and then surged more than 170% to a peak of €114 billion in 2001. After declining to €89 billion in 2003, real dividends rebounded back to €113 billion in 2005 as the European economy improved. In line with the increasing concentration of dividends DeAngelo, DeAngelo & Skinner (2004) and Denis & Osobov (2008) find, von Eije & Megginson show that the sharp rise in dividends during the late 1990s and early 2000s is mostly due to increased dividend payments by large firms that were already dividend payers in 1989. Indeed, they report that the largest decile of public firms accounted for 92.1% of dividends paid by public EU15 firms in 2005, up from 79.0% in 1989.

**Figure 8** also shows a large increase in the real aggregate value of share repurchases in the EU15: Starting at €7 billion in 1989 (representing 17% of total payouts), repurchases remained largely flat during most of the 1990s until they began a rapid and almost monotonic increase around 1997. In 2005, share repurchases in the EU15 totaled €58 billion, representing 34% of total payouts. This marked increase in aggregate repurchases resembles the analogous trend described for the United States in Section 2.2; however, in the case of the United States, the surge in repurchase activity started a few years earlier (in the early 1990s), and by 2005 repurchases constituted close to 63% of total payouts.<sup>10</sup>

The previous discussion indicates that most aggregate trends in payout policy in Europe and other advanced economies have been similar to those experienced in the United States. That said, Goergen, Renneboog & Correia da Silva's (2005) findings suggest that there might be important differences in the extent to which non-US and US firms smooth their dividends, at least in the case of Germany and Japan. Indeed, analyzing dividend changes for a panel of 221 public German firms from 1984 to 1994, Goergen, Renneboog & Correia da Silva find that the dividend policies of German firms are more flexible than those of their US and UK counterparts. Specifically, they find

---

<sup>10</sup>The taxation of dividends and capital gains differs markedly across European countries, with repurchases being tax advantaged relative to dividends in most (but not all) EU15 countries (see, e.g., La Porta et al. 2000).



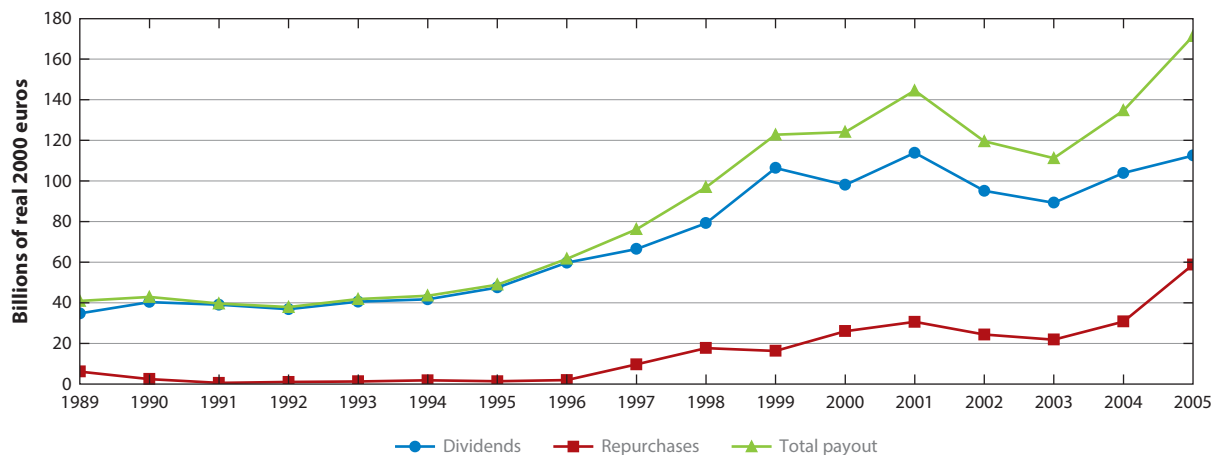
**Figure 7**

The figure shows the fraction of publicly listed EU15 industrial firms that paid a dividend in the relevant country or region. Companies from the United Kingdom are indicated with UK; German and French companies are indicated with Germany and France; Benelux represents companies from Belgium, The Netherlands, and Luxembourg; Southern Europe represents companies from Portugal, Spain, Italy, and Greece; and Other represents companies from Austria, Denmark, Finland, Ireland, and Sweden. Source: von Eije & Megginson 2008.

that more than 80% of loss-incurring German firms with at least five years of positive earnings prior to the loss omit dividends in the year of the loss. This contrasts with the well-known tendency of Anglo-American public firms to only omit dividends in the face of persistently anemic earnings (see, e.g., Miller & Modigliani 1961; Healy & Palepu 1988; DeAngelo, DeAngelo & Skinner 1992; Michaely, Thaler & Womack 1995). At the same time, German firms also tend to rebound quickly from dividend reductions and omissions, with the majority of firms reverting to their initial dividend level within two years of the reduction or omission. These findings echo those that Dewenter & Warther (1998) find in Japan, where public firms are less reluctant to omit and cut dividends and their dividends are more responsive to earnings changes than in the United States.

A plausible explanation for the higher dividend flexibility of German and Japanese public firms is their concentrated ownership structure, which suggests that agency problems between shareholders and management are likely to be lower in these two countries than in the United States or the United Kingdom. As a result, the dividend policy of German and Japanese public firms might be closer to the residual financing decision that Michaely & Roberts (2012) find among privately held firms in the United Kingdom.

That said, the evidence regarding the role that ownership concentration plays in explaining dividend flexibility in Germany and Japan appears to be somewhat mixed. Consistent with ownership concentration being an important driver of dividend flexibility, Dewenter & Warther (1998) show that flexibility in Japan appears to be particularly pronounced among firms operating within industrial groups, or *keiretsu*, where the ties between managers and investors are especially close. Similarly, Goergen, Renneboog & Correia da Silva (2005) show that bank control in Germany is associated with a higher likelihood of omitting dividends when firms suffer a loss,



**Figure 8**

The figure shows the aggregate value of dividends, share repurchases, and total payouts (the sum of dividends and share repurchases) paid out by publicly listed industrial firms in the EU15. All magnitudes are in billions of real 2000 euros of purchasing power. Source: von Eije & Megginson 2008.

although concentrated control by other types of shareholders does not appear to impact dividend flexibility. An alternative (or complementary) potential explanation for dividend flexibility is that regulatory restrictions on share repurchases meant that Japanese and German firms, unlike US firms after 1982, could not use repurchases to distribute temporary earnings during the sample periods of Dewenter & Warther (1998) and Goergen, Renneboog & Correia da Silva (2005). [Japan and Germany started to (partially) lift restrictions on share repurchases only in 1994 and 1998, respectively.]

Analyzing the prevalence of dividend smoothing in other countries with different ownership structures and regulatory regimes might be a fruitful avenue for future research trying to enhance our understanding of when and why firms smooth their dividends.

### 3. THE SETTING: THE MILLER-MODIGLIANI PAYOUT IRRELEVANCE PROPOSITION

Miller & Modigliani (1961) show that, in perfect and complete capital markets with no taxes, a firm's payout policy does not affect its value. The basic premise of their argument is that firm value is determined by choosing optimal investments. The net payout is the difference between earnings and investment, and is simply a residual. Because the net payout comprises dividends and share repurchases as well as issuances, a firm can adjust its payout to any level with an offsetting change in shares outstanding, i.e., by financing the payout. From the perspective of investors, payout policy is irrelevant, because any desired stream of payments can be replicated by appropriate purchases and sales of equity. Taking Miller & Modigliani's conclusions to the extreme, dividends are not only the residual, but can even be set arbitrarily.<sup>11</sup> Given the assumptions behind these conclusions, a firm can pay a dividend that is simply the residual, it can pay a large dividend

<sup>11</sup>If not all free cash flow is distributed to investors, then it is implicitly assumed that it is invested in zero-NPV projects. For an interesting discussion of this and related issues, see DeAngelo, DeAngelo & Stulz (2006).

financed by (costless) external finance, or it can pay nothing and accumulate the money in the firm. As long as the funds are invested in zero-NPV projects, none of these policies will have any impact on value. Thus, investors will not pay a premium for any particular payout policy. Importantly, the same argument can be applied if a particular payout policy is financed by debt rather than by equity issuance.

There are several important insights we can extract from this simple setting: First, in perfect and complete capital markets, the only determinant of a firm's value is the present value of what the firm produces, which is a function of its investment policy, not its payout policy. Second, manipulations of the right-hand side of the balance sheet have no effect on a firm's value. As a result, once investment is chosen to maximize firm value, how much the firm pays out will not affect its value. Net payout can be thought of as the residual cash flow, after investment decisions have been made. The level of dividends or repurchases can take any value, given that the level of security issuance can offset any level of payout. Third, understanding Miller & Modigliani's (1961) proposition allows us to better understand why payout policy may affect value. It will happen only if one or more of Miller & Modigliani's assumptions are violated. In general, their irrelevance proposition is only valid in perfect and complete capital markets. If one or more of the assumptions behind their paradigm do not hold, payout policy may become relevant in that it can affect firm value. Then the notion of optimal payout policy is suddenly relevant and by no means trivial. The following is a list of some of the more important assumptions behind the paradigm:

1. No taxes.
2. Symmetric information among all market participants.
3. Complete contracting possibilities.
4. No transaction or issuance costs.
5. Competitive product and financial markets.
6. Rational investors and managers.

Clearly, these assumptions rarely hold. With respect to the first assumption, in practice, both dividends and capital gains are subject to taxation. Moreover, the tax rates are not the same over time, and the differences in tax rates between dividends and capital gains vary across investor groups and over time. As we discuss in Section 4, this variation may affect the form and the magnitude of payouts. It may also result in investor clienteles for particular types of payouts.

The second assumption of symmetric information among all market participants rarely holds. In practice, market participants do not possess identical information: Insiders and managers are likely to be more informed than other market participants, leading to asymmetric information problems. One implication of information asymmetry is that a firm may not be able to issue securities at fair value because of adverse selection problems. Another implication is that payouts can be used to signal information about the value of the firm to outsiders.

Regarding the third assumption, complete contracts rarely exist and conflicts of interest between agents and principals are present in many situations, be it between managers and outside equityholders, between large and small shareholders, or between shareholders and debtholders. These conflicts of interest may affect payout policy and consequently firm value (e.g., Easterbrook 1984, Kalay 1982a, Michaely & Roberts 2012). For instance, without complete contracting possibilities, dividend policy can help ensure that managers act in the interest of shareholders. A high payout ratio may induce management to be more disciplined in the use of the firm's resources and consequently increase firm value. Also, limits to optimal contracting possibilities may lead to such *prima facie* second-best outcomes as the conditioning of executive pay on EPS targets.

The fourth assumption above—transactions costs—affects Miller & Modigliani's (1961) irrelevance proposition for at least two reasons. First, investors may have a preference for

a particular stream of cash flow when trading is costly. In the presence of transactions costs, a dividend policy that fits consumption needs results in higher valuation than a policy that does not fit these needs. Second, issuance costs drive a wedge between payout policy and net payout policy. For instance, unlike in Miller & Modigliani's framework, firms in the real world cannot costlessly pay dividends and then costlessly adjust their capital by issuing equity. The violation of this assumption may be a deterrent for payout, or in some circumstances, can serve as a partial motivation for payout (Bhattacharya 1979). How a firm's payout policy fits into its financial decision "ecosystem," which includes its financing policy, risk management, and other aspects, is an issue that is underexplored in the literature. We attempt to provide some insights into these aspects as we move along.

The fifth assumption is an important component of the perfect and complete capital markets paradigm. It states that both capital markets and product markets are competitive. For example, competitive forces can be used to limit the amount of perks consumed by managers. In this setting, a firm's payout, which can also serve as a disciplinary device, may interact with the extent of product market competition. In a noncompetitive product market, not paying dividends and accumulating cash for strategic reasons, for instance to deter predation (Bolton & Scharfstein 1990), may render payout policy relevant to firm value.

Last but not least is the assumption of perfect rationality by all market participants. In practice, there is less than perfect rationality by some or all market participants. Some investors may have preference for dividends that is more difficult to understand in a rational framework (Shefrin & Statman 1984, Baker & Wurgler 2004), or perhaps managers may be able to exploit investors' (irrational) misvaluation and buy back shares when the firm is undervalued.

In the remainder of this article, we review recent developments that show empirically how relaxing these assumptions affects firms' payout choices and value.

## 4. TAXES

The literature on how the taxation of dividends and capital gains affects corporate payout policy, as well as the impact of taxation on valuation, is long and extensive. We briefly summarize the theory and evidence accumulated in the twentieth century and then concentrate on the new insights that have been documented in the twenty-first century. (We refer readers to the thorough reviews by Allen & Michaely 2003 and DeAngelo, DeAngelo & Skinner 2008 for a more extensive discussion of the "established" literature.) This section starts by addressing the relation between dividend taxation and firm value or returns. We then turn to the question of whether differential dividend taxation across investors results in dividend tax clienteles. These clienteles can be static (buy and hold clientele) or dynamic (investors trade in and out of stocks around the dividend payment) in nature. We then review a body of work centered on changes in taxes and their effect on prices, trading volume, clienteles, and the supply of dividends, with particular attention to the 2003 dividend tax cut.

How important is the relative taxation of dividends and capital gains for dividend policy? How important is it to investors and to firms' valuation? Basic economic principles suggest that, given that investors value after-tax cash flows, dividend taxation should be of first-order importance. Indeed, as judged by the amount of academic work devoted to this issue in the economics, finance, accounting, and tax literatures, one would have to conclude that taxes are of first-order importance. Nonetheless, the results of the management survey by Brav et al. (2005) suggest that dividend taxation is not a first-order concern for managers. Brav et al. find that most CFOs say that tax considerations matter, but are not a dominant factor, in their decisions about whether to pay or increase dividends, or in the choice between paying out via share repurchases or dividends.

Brav et al. confirm this conclusion through 23 in-person interviews with top executives. The empirical evidence likewise indicates that differential taxes are a second-order concern for corporate executives.

#### 4.1. The Impact of Dividend Taxation on Stock Prices and Returns

An important strand of the literature analyzes the impact of dividend taxation on stock prices and returns. Two distinct settings have been used to test whether differential taxes on dividends and capital gains impact firm valuation: capital asset pricing model (CAPM)-based studies and ex-dividend-day studies, which we discuss in this order.

We start with the CAPM-based studies. On the theory side, Brennan (1970) was the first to develop an after-tax version of the CAPM. Litzenberger & Ramaswamy (1979, 1980) extend Brennan's model to incorporate borrowing and short-selling constraints. In both cases, the basic result is that, for a given level of risk, the compensation for a higher dividend yield is positively related to the differential taxes between dividends and capital gains. Empirically, several researchers have tested the impact of the dividend yield on returns in this CAPM setting, including Black & Scholes (1974), Miller & Scholes (1982), and Litzenberger & Ramaswamy (1979, 1980). The empirical results are mixed.

Litzenberger & Ramaswamy (1979, 1980), for example, found a yield coefficient that is positive and significantly different from zero. They interpreted their finding as consistent with Brennan's (1970) after-tax CAPM. That is, the positive dividend yield coefficient was interpreted as evidence of a dividend tax effect. However, it is difficult to isolate the dividend tax effect in such a setting. Indeed, Miller & Scholes (1982) challenge both the interpretation of these findings and the findings themselves. First, they argue that information effects cloud Litzenberger & Ramaswamy's interpretation that the positive yield coefficient is because of differential taxes. Moreover, Miller & Scholes show that when they adjust the sample to include only dividends declared in advance, the yield coefficient is statistically insignificant. In response, Litzenberger & Ramaswamy (1982) construct a dividend yield variable that incorporates only information that investors could possess at the time and find the yield coefficient to be positive and significant again. Miller & Scholes remain unconvinced.

To resolve the informational issue, Kalay & Michaely (2000) perform Litzenberger & Ramaswamy's (1982) experiment on weekly data, excluding all weeks containing both the dividend announcement day and ex-dividend day. Nevertheless, they find a positive and significant yield coefficient, implying that information is not the driving force behind Litzenberger & Ramaswamy's result. However, they also find that the positive yield coefficient is coming from time-series variation and not from cross-sectional variation across stocks with different yields. That is, the variation in returns is between ex-dividend weeks and non-ex-dividend weeks. These latter results are inconsistent with the tax interpretation.

Overall, whether dividend yield is significant in asset pricing tests is not clear (see, e.g., Campbell & Shiller 1988, Cochrane 2011, Boudoukh et al. 2007, Eaton & Paye 2014). It is even less clear whether a significant dividend yield can be interpreted as a tax effect, especially given the potential correlation between dividend yield and risk factors (see, e.g., Chen, Grundy & Stambaugh 1990). For example, Fama & French (1993) show that, when using the three-factor model, there is no trace of different intercepts among portfolios with different dividend yields. Many asset pricing tests use dividend yield to explain return variation, but because their focus is not on the tax effect, we leave the review of this extensive branch of the literature for another occasion (see, e.g., Campbell & Shiller 1988, Cochrane 1991, Boudoukh et al. 2007).

The second setting that has been extensively used to examine the impact of differential taxation on asset returns is studying price behavior around the ex-dividend day. By construction, this type of setting is less ambitious. Because it examines only a narrow frame of a few days of returns, its aim is not to inform us about overall equilibrium valuations or returns. At the same time, it is much less subject to the criticism of contemporaneous impact of information or other omitted variables.

The pioneering study was conducted almost 45 years ago by Elton & Gruber (1970). In a simple setting that assumes risk neutrality and no transactions costs, Elton & Gruber show that it must be the case that

$$P_B - t_g(P_B - P_0) = \bar{P}_A - t_g(\bar{P}_A - P_0) + D(1 - t_d), \quad (1)$$

where  $P_B$  is the stock price cum-dividend (the last day the stock is traded with the dividend),  $\bar{P}_A$  is the expected stock price on the ex-dividend day (the first day the stock is traded without the dividend),  $P_0$  is the stock price at initial purchase date,  $D$  is the dividend amount,  $t_g$  is the personal tax rate on capital gains, and  $t_d$  is the personal tax rate on dividends.

The left-hand side of Equation 1 represents the after-tax receipts the seller would receive if she sold the stock cum-dividend and had bought it originally for  $P_0$ . The right-hand side represents the expected net receipts from a stock sale on the ex-dividend day. Rearranging yields an expression for the so-called premium:

$$\text{Premium} = \frac{P_B - \bar{P}_A}{D} = \frac{1 - t_d}{1 - t_g}. \quad (2)$$

Hence, in this setting, the price drop relative to the dividend paid is directly related to relative taxation of dividends and capital gains. The higher the (relative) taxes on dividends, the lower the premium is. This insight motivates the literature on tax clienteles. The idea is that investors in low tax brackets should hold high dividend yield stocks and investors in high tax brackets hold low dividend yield stocks. Then, the observed ex-dividend-day premium will reflect this clientele. High dividend yield stocks will have higher premiums (price drop between the cum- and the ex-dividend days that is closer to the amount of dividend paid) than low dividend yield stocks, reflecting the marginal tax bracket of the respective clientele. Elton & Gruber (1970) find strong evidence for this effect.

Subsequent research has added several important dimensions to this framework. First Kalay (1982b) argues that dynamic arbitrage could eliminate the tax effect in prices. Traders with the same tax rate on dividends and capital gains will buy the stock before it goes ex-dividend and sell it immediately after the dividend is paid. Without risk or transactions costs, the arbitrage will ensure that the price drop is equal to the dividend. Risk and transactions costs, however, limit the arbitrage opportunity. Michaely & Vila (1995) investigate the role of risk in the ex-dividend-day trading and pricing. Agents trade because they have heterogeneous valuations of dividends relative to capital gains (on an after-tax basis). However, they trade only to an extent, because any deviation from optimal risk sharing is costly as well. In other words, the existence of risk precludes pure arbitrage opportunities and prices are determined in equilibrium. Consequently, no trader will attempt to take an unlimited position in the stock, regardless of his or her tax preference. One of the insights from this literature is that, unless a perfect tax clientele exists in which different groups hold different stocks rather than just different quantities of the same stock, it is not possible to infer tax rates from price alone. However, we can infer the cross-sectional distribution of tax rates by using both price and volume data. By observing the premium alone, we can infer only the weighted-average relative tax rates, not the entire distribution of tax rates for the trading



population. Michaely & Vila (1995) show that the second moment of the distribution can be extracted from the volume behavior on the ex-dividend day.

Whenever there is dynamic trading, such as around the ex-dividend day, transactions costs are important. Michaely, Vila & Wang (1996) develop a formal model that incorporates the effect of both transactions costs and risk on ex-dividend-day prices and trading. Empirically, Karpoff & Walkling (1990) previously showed that ex-dividend-day excess returns are lower for stocks with lower transactions costs. Michaely & Vila (1996) and others show that the abnormal volume on and around the ex-day is significant, and that ex-day volume is a decreasing function of transactions costs. Most of the ex-day trading activity is concentrated among stocks with high dividend yield and low transactions costs. Concentrating on the role of risk, Koski & Michaely (2000) report that ex-day trading volume increases in orders of magnitude more when traders are able to arrange the cum-day/ex-day trading using nonstandard settlement days. That is, by virtually eliminating the risk exposure and reducing transactions costs, volume increases significantly.

Turning back to the price impact on the cum- and ex-dividend day, Elton & Gruber (1970), Kalay (1982b), and many of the papers that follow find a premium that is less than one. The exact value of the premium varies through time and averages around 0.9. This result is consistent with differential taxation of dividends and capital gains having an impact on ex-day trading. But this view has been legitimately challenged on several grounds. The most important challenge is whether the empirical finding of a premium that is less than one is a consequence of institutional features such as the size of the bid-ask spread rather than differential taxation.

Frank & Jagannathan (1998) argue that bid-ask spread, another measure of transactions costs, affects the ex-dividend-day premium. As for empirical evidence, the authors find that the average price drop is less than the dividend in Hong Kong, where dividends and capital gains are not taxed. This finding suggests that nontax explanations that are not captured in the traditional framework of Elton & Gruber (1970) should be considered in the context of ex-dividend-day studies. Relatedly, Bali & Hite (1998) argue that the premium deviates from one because of price discreteness. Graham, Michaely & Roberts (2003) directly test these arguments by examining how the ex-dividend-day premium changes in response to exogenous shocks in the bid-ask spread. Specifically, the study examines the effect of the New York Stock Exchange's (NYSE's) conversion of the price quotations from 1/8ths to decimals around 2001. It finds that premiums decrease rather than increase in the decimal pricing era relative to the 1/8ths pricing era, which is inconsistent with microstructure explanations of ex-day price movements. (Jakob & Ma 2004 find that the cum- to ex-day price drops are equally likely to correspond to the tick above the dividend or below the dividend, which is direct evidence against Bali & Hite's assumption that prices are always rounded down.)

The findings of other studies in the United States (Lakonishok & Vermaelen 1986, Michaely & Vila 1996) and in other countries such as Italy (Michaely & Murgia 1995), Japan (Kato & Loewenstein 1995), and Sweden (Green & Rydqvist 1999) also clearly indicate that there is abnormal trading activity around the ex-dividend day. The evidence also shows that the trading activity is positively related to the magnitude of the dividend and negatively related to the level of transactions costs and risk. All in all, bid-ask spread is an important form of transactions costs and, hence, has an effect on prices and volume around the ex-dividend day. Bid-ask spread, however, is not the reason why the ex-dividend-day price drop does not equal the dividend amount.

## 4.2. Static and Dynamic Tax Clienteles

Investors are not a homogeneous group and are subject to different relative taxation of dividends compared to capital gains. This difference in tax rates may lead to both static (buy and hold) and

dynamic (trading around the ex-day) clienteles. There is robust, though mostly indirect, evidence of dynamic clienteles composed of investors who trade in and out of stocks around the ex-dividend days (see, e.g., Michaely & Vila 1996). The evidence is largely indirect given that what we observe is the marked increase in trading volume around the ex-day, but we do not have direct evidence on who is trading. Typically, the literature attributes the buying before the ex-day to corporations that pay lower taxes on dividends relative to capital gains and to institutions that try to arbitrage away the discrepancy between the expected price drop and the dividend amount.

Clearly, more direct evidence is needed regarding who is buying and who is selling before and after the ex-dividend day. To do so, one would need a database that includes the identity of traders. Merely knowing whether the trades are being done by institutions or individuals would not be enough given that, within each group, there are different tax rates for dividends and capital gains. A step in this direction is taken by Graham & Kumar (2006), who examine trading patterns of 60,000 individual accounts and suggest investors in lower tax brackets tend to buy before the ex-dividend day. Similarly, Hietala (1990) finds that individuals are the marginal sellers of stocks on ex-dividend days in Finland, which has a similar tax code to the United States. In this context, it is important to remember that the vast majority (more than 95%) of the trades on the NYSE are executed by institutions, so one might reason that individual trades are not necessarily the most important evidence in the context of dynamic trading around the ex-day.

Rantapuska (2008) might offer the most detailed study on dynamic clienteles to date. His study strongly supports dynamic dividend clientele theories. Using data on the trading behavior of all investors in the Finnish stock market, Rantapuska is able to show that investors with a preference for capital gains income over dividend income sell shares cum-dividend and buy stocks ex-dividend, and vice versa. Clearly, as more refined data become available, both the static and dynamic clientele aspects are issues that are worthy of further exploration.

The evidence on static clienteles is somewhat more direct and more abundant. Individuals, directly and indirectly (e.g., through mutual funds), used to hold the vast majority of equity in the United States; however, throughout the twentieth century, the portion held by individuals declined. Poterba (2004), for example, estimates that individuals, either directly or indirectly through mutual funds, held only 57% of equities in 2003 compared to more than 90% in the first half of the twentieth century.

A related and relevant question is the type of individuals who hold dividend-paying stocks. Allen & Michaely (2003) collect information from the Federal Reserve's Flow of Funds Accounts for the United States, and from the IRS's SOI Bulletin about total dividends paid and the amounts received by individuals and corporations for the years 1973–1996. Individuals received more than 50% of the dividends paid out by corporations. Moreover, most of these dividends were received by individuals in high tax brackets. This fact might suggest that dividend tax clientele effects are not a dominant force in the determination of portfolio holdings. Perhaps other forces that interact with dividends, such as agency, are at work.

In this context, looking at how institutional holdings interact with dividends is interesting. First, it sheds direct light on whether a dividend-related institutional clientele exists (though it may not be related to relative taxation). A second insight is that it may tell us something about dividend clientele by individuals (the complement to institutions). Grinstein & Michaely (2005) document a general dividend aversion by institutional investors. Using information about US corporations and all institutional investors who file SEC Form 13F, they document that, although institutional investors do not like to hold stocks that do not pay any dividends, they prefer to hold low dividend yield rather than high dividend yield stocks. From a tax perspective, this is not what one would expect. Given institutional investors' dividend tax advantage (relative to individual investors) they should exhibit a preference for high dividend yield stocks rather than low dividend yield stocks.

Several papers conduct a more in-depth analysis of the relation between the characteristics of institutional investors and firms' payout policies. Del Guercio (1996) examines the role of dividends in the portfolio selection of institutions. Controlling for several other factors such as market capitalization, liquidity, risk, and S&P rating, she finds that dividend yield has no power to explain banks' portfolio choices and has negative explanatory power in mutual funds' portfolio choices. Hotchkiss & Lawrence (2007) show that some institutions consistently hold high dividend yield stocks and some consistently hold low yield stocks. They also find that when firms change their dividend policy (for example a large dividend increase), the clientele of institutions changes accordingly. Their paper presents convincing evidence that institutional clienteles exist. The extent to which these institutional clienteles relate to relative taxation is still an open (and interesting) question. Desai & Jin (2011) provide further evidence by combining Form 13F filings with data on a classification of the clients of some of the institutions. They are thus able to draw a somewhat closer link between institutional clientele and tax preferences. Their evidence suggests a positive association between their proxy of tax preferences of institutions and the dividend policy of the firms they hold.

### 4.3. Using Tax Changes to Test the Impact of Relative Taxation

The above studies show correlations that are informative about theories on how taxes affect payout policy. A cleaner identification of such effects may be achieved by the use of shocks to taxes. There have been several studies that utilize exogenous changes in the relative taxation of dividends and capital gains to examine the impact of taxation on the ex-dividend-day prices and investor behavior. These studies are more "local" in that they typically do not use all the available data over a long time period but achieve an experiment that is much less subject to confounding effects such as transactions costs, the effect of bid-ask spreads, etc.

One early study looks at the British market before and after tax changes and finds evidence that indicates a tax effect (Poterba & Summers 1984): Changes in relative taxation of dividends and capital gains resulted in higher ex-dividend-day abnormal return. In another study, Barclay (1987) examines the ex-dividend-day price prior to the 1913 introduction of federal taxes in the United States and compares it with its behavior in the years 1962 to 1985. He finds that the average premium was not significantly different from one before the enactment of the federal taxes, but was significantly below one after the enactment. Barclay concludes that the higher taxes on dividends after 1913 caused investors to discount their value.

Michaely (1991) examines the effect of the TRA on ex-day stock price behavior. The TRA eliminated the preferential tax rates for long-term capital gains that had been adopted in 1921; dividend income and realized capital gains were taxed equally after the reform. The average premium, both before and after the TRA, was not significantly lower than one. Comparing these results to earlier periods, Michaely (1991) suggests the change in the relative pricing of dividends between the 1960s and the 1980s was not because of taxes, but perhaps because of the change in the relative importance of the various trading groups. Lower transactions costs combined with easier and cheaper hedging instruments increased the ex-day trading by corporations and arbitrageurs, which resulted in ex-dividend price behavior consistent with those groups' marginal tax rates.

Hubbard & Michaely (1997) examine the relative prices of two classes of common stock of Citizens Utilities after the passage of the TRA. Until 1989, this Citizens Utilities had two types of common stocks that differed only in their dividend policy. Series A stock paid a stock dividend, and Series B stock paid a cash dividend. Thus, the price ratio of these two stocks should reflect relative dividend taxation. Because the TRA substantially reduced the advantage of receiving stock

dividends rather than cash dividends, the authors hypothesize that the price ratio should decrease. Indeed, they found that, during 1986, the price ratio was considerably lower than in the previous years. However, in the years 1987 through 1989, the price ratio rose and stayed consistently above the dividend ratio. It is difficult to attribute the pattern in the relative prices of the Citizens Utilities shares to changes in differential taxes.

More recently, Graham, Michaely & Roberts (2003) examine the price behavior around the 1997 reduction in the capital gains tax rate from 28% to 20%. The tax hypothesis implies that a decrease in capital gains taxation (relative to dividends) should reduce premiums. Empirically they find a reduction of the median premium from 0.89 in the year before the tax change to 0.75 in the years after the change. Consistent with the tax hypothesis, the difference is statistically significant, economically large, and also of the appropriate magnitude given the size of the capital gains tax rate reduction.

Perhaps the most significant change in tax regime (at least as far as relative taxation on dividends) is the JGTRRA. The JGTRRA reduced the top tax rate on dividends and capital gains to 15%, effectively equating it to the tax rate on (long-term) capital gains tax rates (Brav et al. 2008b). Many of the papers we review below concentrate on the impact of the JGTRRA on the supply of dividends. The hypothesis that the act increased dividend supply is reasonable, as one of the main objectives of the JGTRRA was to give the economy a boost by increasing investors' disposable income.

Chetty & Saez's (2005) findings suggest that the 2003 dividend tax cut led to increased dividend initiations, potentially helping reverse the dramatic reduction in the proportion of public firms paying dividends that Fama & French (2001) documented. One thing to keep in mind when interpreting these findings is the extent to which tax changes might be anticipated by firms. If firms do anticipate tax changes, dividend payments in the years preceding the tax cut may have been postponed and thus particularly low, overstating the effect of the actual tax cut. The temporary nature of the dividend increases certainly supports this notion. In addition, shortly after the JGTRRA came the enactment of the American Jobs Creation Act of 2004, which established a one-year tax holiday for repatriations of cash to the United States and might affect the measurement of the 2003 dividend tax cut. Industry pressure for another tax holiday in current times supports both the notion of firms strategically postponing tax-relevant corporate finance decisions, including payouts, to make the best use of their incidence, as well as the endogenous nature of the enactment of such changes in the regulatory environment. Brav et al. (2008b) agree with Chetty & Saez that the tax reduction contributed to the reappearance of dividend-paying firms but suggest that this tax reduction is not the most important factor. They present evidence that the surge in repurchase activity during the very same period was even more pronounced. They also show that there was a surge in dividend initiations that peaked in the quarter following the tax cut and then returned to pre-cut levels, consistent with the notion that firms postponed their dividend payments until after the act. Moreover, the average age of an initiator also fell in the year after the tax cut but has since returned to historic levels. Taken together, these results are not consistent with the 2003 dividend tax cut having had a long-lasting, first-order impact on payout policy.

Other recent research suggests that the 2003 dividend tax cut led to increases in special dividends (Blouin, Raedy & Shackelford 2004), as well as to increases in dividend payments among those firms that were already paying dividends (Chetty & Saez 2006). However, as discussed earlier, this second conclusion has been challenged by other researchers. Several studies also find that stocks that are primarily held by individuals were affected more by the 2003 dividend tax cut, consistent with the hypothesized tax effect: The tax cut reduced tax rates for retail investor taxable accounts. The reduction was much weaker, if present at all, for accounts of institutions that were already tax-favored. Blouin, Raedy & Shackelford (2004) find that "dividend boosts were

increasing in the percentage of the corporation held by individual investors.” Putting aside endogeneity issues, Chetty & Saez (2005) show that dividend changes were smallest in stocks for which the largest investor was an institutional type that was not affected by the tax rate reduction. Firms whose investors benefited the most from the tax cut—individual investors—increased dividends the most. It is an open question whether the results of these studies can be reconciled with those of other researchers (e.g., Allen & Michaely 2003, Poterba 2004) who directly examine investors’ clientele and do not find results consistent with tax clientele. Perhaps more information on how payout policy of firms in other countries with similar clientele evolved over the same time period can provide more clarity.

The above studies suggest that holding clientele may have an effect on payout. At the same time, tax considerations of other constituencies seem to have an impact as well. For example, stock options generally are not dividend-protected, leading Weisbenner (2000) and Fenn & Liang (2001) to argue that executives who receive ample stock options are less inclined to increase their firms’ dividend payments. Brown, Liang & Weisbenner (2007) and Chetty & Saez (2005) confirm this prediction empirically in the context of the tax cut. Brown, Liang & Weisbenner also show that dividends increased disproportionately at firms in which executives own the most stock. These papers conclude that the dividend initiations and increases in late 2003 and 2004 were not merely a part of a time trend of increasing dividends, but instead occurred at different rates at the firms that had the greatest net tax incentive to increase dividends.

Fos, Kim & Kronlund (2014) examine firms’ responses to the impending “fiscal cliff” at the end of 2012, which threatened to trigger a reversal of the 2003 dividend tax cuts—that is to say, dividend tax increases. Thus, rather than an actual change of dividend taxes, these authors make use of a change of tax expectations. They find a significant acceleration of (special) dividend payments in the last two months of 2012. This spike is driven by firms with high insider ownership, i.e., a large fraction of shareholders that are subject to individual dividend taxes. These special dividends amounted to approximately \$16 billion. This number compares to a total payout of Compustat firms of more than \$610 billion in 2012, of which \$258 billion were dividends. This comparison underscores that, although taxes play a significant role for individual firms’ behavior in specific circumstances, they play a second-order role in the big picture.

What do managers think about the importance of dividend taxation and the dramatic 2003 tax cut? As noted above, in the original Brav et al. (2005) survey (conducted before the 2003 dividend tax cut), managers did not put too much weight on relative taxation as a determinant of dividend policy. A follow-up survey conducted by Brav et al. in June 2003, after the 2003 dividend tax cut, reinforces the second-order importance of taxation. Although a minority of executives in that survey said that reduced dividend taxation would eventually lead to dividend increases at their firms, more than two-thirds said that the dividend tax reduction would either definitely not or probably not affect their dividend decisions. In terms of initiations, only 13% of nondividend payers indicated that the tax cut would result in their firm initiating dividends.

This response is further reinforced in Brav et al. (2008a,b): They find that only 9% of firms that did not pay dividends in May 2003, but which survived for the two years after, initiated dividends. Among initiators, the survey response suggests the long-term stability of cash flows and cash position of the firm are more important than tax considerations, and the reduced availability of profitable investments and the desire to attract institutional investors are on par with taxes. Finally, for those firms in the sample that had already paid dividends in 2003 (more than 40% of the sample), the picture is not much different: These dividend payers report that the historic level of the dividend is more important than are tax considerations. The stability of cash flows, cash on hand, investment opportunities, and attracting institutional investors are also more important.

Brav et al. (2008a,b) triangulate their analysis by also examining press releases of 265 firms who initiated dividends between the first quarter of 2002 and the end of 2005. Out of the 76 firms that initiated dividends during the second half of 2003, 24 explicitly mention the dividend tax reduction in their press release as an explanation of why they began paying dividends, although taxes were not necessarily the primary reason cited. However, even though reduced dividend taxes are still in effect, starting in 2004, very few firms mention dividend tax rates as a reason for initiating dividends. This pattern is consistent with the tax cut influencing on-the-fence firms to initiate a dividend, but for the majority of firms, dividend taxation remains second order in importance.

#### 4.4. Real Effects of Dividend and Capital Gains Tax Changes

Using a long time series, Poterba (2004) demonstrates that, at the aggregate level, dividend distributions are not sensitive in a reliable manner to changes in the relative taxation of dividends and capital gains. Yagan (2014) analyzes several corporate tax returns for the years 1996–2008 (a time period that includes the 2003 dividend tax cut). He finds that, even though the 2003 dividend tax cut was associated with a modest increase in the amount of dividend paid to shareholders, it had no effect on investment or employee compensation. These combined findings suggest that the relative taxation of dividends has no material effect on firm behavior, thus questioning the extent to which the relative taxation of dividends affects firms' cost of capital or value. However, in our opinion, these two very important questions—the effect of relative taxation on the supply of dividends and its effect on a firm's real decisions—are not yet entirely resolved.

#### 4.5. Dividends and Taxes: Conclusions

There are four important aspects concerning the impact of dividend taxation. First, does the differential taxation of dividends versus capital gains have an impact on firms' value or cost of capital? The summary of the evidence presented here suggests a somewhat ambiguous answer: There is no reliable evidence of significant cross-sectional variation of firm value that can be attributed to dividend taxation. When we narrow the focus to the behavior on the day of the dividend payment itself, there is more consistent and convincing evidence that dividend taxation affects relative prices, at least to an extent. Overall, the evidence from the ex-day studies on the price impact of differential taxation appears to indicate that, from a tax perspective, dividends should be minimized.

Second, does the differential taxation of dividends versus capital gains affect investors' clientele, in the sense that investors with tax-motivated dividend preferences migrate toward high dividend-paying stocks and investors with low tax-motivated dividend preferences migrate toward dividend yield stocks? This migration can be static (buy and hold) or dynamic (getting in and out stocks before and after the firm pays dividends). What seems like the most obvious static clientele—individuals should tend to hold low yield stocks and institutions hold high yield stocks—is not supported by the data. Examining the tax returns of high tax bracket individuals, or looking directly at institutional holdings, even provides evidence contradicting the hypothesis: Individuals in high tax brackets receive most of the dividends and institutions prefer low dividend yield stocks. Among institutions, there is evidence of some preference of different institutional types for particular dividend yields. More precise data are needed to conclude that these types of (static) clienteles are because of taxes.

The abnormally high trading volume around the ex-day, particularly in high-yield and low transactions costs stocks, is strong (though indirect) evidence of dynamic clientele. The high



volume of trading around ex-day indicates that the shares change hands from one investor group to the other at least temporarily. This evidence tells us that taxes affect behavior of individuals to a significant extent. Nevertheless, taxes are less important in explaining the aggregate picture, as the following paragraph underlines.

Third, does the differential taxation of dividends versus capital gains affect the supply of dividends? Do firms pay more of their cash as dividends in periods of low differential taxation between dividends and capital gains? Poterba (2004) and several other studies that include the 2003 dividend tax cut suggest a rather weak link between the amount of dividends firms pay and dividend taxation. Nonetheless, these are important questions and promising avenues for future research.

Fourth, what are the effects of dividend taxation on the “real” decisions firms make such as investment, R&D, compensation, and cash holdings? Perhaps this is the most important issue, and one on which we know the least. It is important to policymakers and academic researchers alike, and more research is warranted.

## 5. ASYMMETRIC INFORMATION AND INCOMPLETE CONTRACTS

The potential role of asymmetric information and incomplete contracts on financial decisions such as leverage and dividend choices has been the center of attention since the breakthrough works of Jensen & Meckling (1976), Myers (1977), Ross (1977), Myers & Majluf (1984), Jensen (1986), Bhattacharya (1979), Miller & Rock (1985), John & Williams (1985), and many others. The focus has been both on the theoretical side and perhaps even more on the empirical dimension as the wealth of theories gave empirical research new ways to look at the data on payouts. We start this section by presenting the framework on which these innovations are based and the empirical work that emerged until the end of the twentieth century (see Allen & Michaely 2003 for a more detailed review of this literature). We then delve into more detail on more recent developments.

### 5.1. Signaling Models

The basic intuitive idea behind the dividend signaling models (see, e.g., Bhattacharya 1979, Miller & Rock 1985, John & Williams 1985) is that managers have information about their firms that the market does not have, and that they have some incentive to reveal this information to the market. For example, managers internalize that some shareholders want to sell their holdings at fair prices, and this factor enters managers’ decisions. Undervalued firms adjust dividends to signal their prospects. A rise in dividends typically signals that the firm will do better (i.e., it is undervalued), and a decrease suggests that it will do worse. These theories may explain why firms pay out so much of their earnings as dividends and why the market reacts positively to announcements of (unexpected) dividend increases.

In Bhattacharya’s (1979) model, the critical assumption is that if future cash flows are insufficient to cover the promised dividends, the firm will raise costly external financing. In equilibrium, firms that are undervalued by the market will pay dividends. It is not worthwhile for a firm with a bad (aka overvalued) project to do this, because it will have to resort to costly outside financing to finance the dividend. But there is nothing unique to dividends relative to repurchases in the model’s settings. Thus, Bhattacharya’s model can apply equally to repurchases. Given the trend toward paying more and more cash through repurchases, this may be seen as an attractive feature of the model.

In the Miller & Rock (1985) model, the critical assumption is that firms shave investments to make dividends higher and signal high earnings. Thus, the dissipative costs arise from the



distortion in the firm's investment decision. Just as in Bhattacharya's (1979) model, here repurchases are a perfect substitute for dividends. John & Williams (1985) present a model in which higher taxes on dividends are the cost of the signal. Their model shows that dividends and repurchases are not equivalent methods of payouts. Using one or the other will result in different valuation; i.e., with differential taxation, a firm cannot achieve the objective of higher valuation by substituting a dollar of dividends for a dollar of repurchases.

Allen, Bernardo & Welch (2000) assume that firms pay dividends because they are interested in attracting institutions as stockholders. Institutions, and especially untaxed institutions, may be attracted to dividend-paying stocks because they are a tax-disadvantaged payout method for other potential stockholders. According to Allen, Bernardo & Welch, the reason good firms like institutions to hold their stock is that these stockholders are better informed and have a relative advantage in detecting high firm quality. Low-quality firms do not have the incentive to mimic, given that they do not wish their true worth to be revealed. Thus, dividends are a signal of quality. Dividends and repurchases are not treated as substitutes in this model either.

These models (and many other models that are not reviewed here) are important contributions that provide fundamental insights. They also have important empirical implications. First, announcements of dividends contain information that is positively correlated with the market response to the dividend news; and, second, dividends convey good news about the firm's prospects or quality. (The majority of the theoretical and empirical research has assumed that firms use dividend changes to signal changes in future earnings or cash flows.)

Two more important points before we move on. First, in a world of asymmetric information, dividends may convey information even if they are not meant as a signal. Just imagine you look from your office window down the street and see people walking with umbrellas. You can extract valuable information from this observation about the likelihood of rain, although, in all likelihood, the people on the street are not trying to signal to you that rain is likely. The same is true with dividends. Using the sources and uses of funds identity, and assuming the firm's investment is known, it is clear that dividend announcements may convey information about current earnings and maybe even about future earnings if earnings are serially correlated, even in the absence of any signaling motivation. To the extent that investment is known, dividends are the residual. Thus, larger-than-expected dividends imply higher earnings. Because the market does not know the current level of earnings, higher-than-anticipated earnings would lead to a stock price increase. This interpretation of dividend announcements is not new: It originated with Miller & Modigliani (1961) and later was used in the more formal argument in Miller & Rock (1985).

Second, an alternative signaling story, which is currently underexplored, is that dividend changes convey information not only about expected cash flows, but also about cash flow volatility, or its risk. This is not an entirely new idea and its roots can be attributed to Lintner's (1956) finding that firms that increase their dividends hate to cut them back. A dividend increase thus implies that a firm expects lower earnings volatility. By definition of value-relevant news, the fundamental news about a firm must be about either its cash flows or its discount rate (risk characteristics). If the good news in a dividend increase is not about increases in future cash flow (per empirical evidence), then it might concern a decline in (systematic) risk exposure of these cash flows. Current dividend-signaling models have very little to say about the relation between dividend changes and risk changes. Still, Grullon, Michaely & Swaminathan (2002) explore this alternative possibility, which they refer to as the "maturity hypothesis." They show that firms that increase (decrease) dividends experience a significant decline (increase) in their systematic risk, and they argue that the positive market reaction to a dividend increase is related to this subsequent decline in systematic risk. DeAngelo, DeAngelo & Stulz (2006) further explore this connection between payout policy and firm maturity, arguing that as firms mature and face fewer growth

opportunities relative to what they used to, they will start to pay higher dividends. (We review those findings later in this section.)

To date, there is no formal signaling model that explores the implication that dividends signal not only the expected level of cash flow, but also the riskiness of the cash flow. Such a model may yield new empirical guidance on why and when firms change their dividend policies.

## 5.2. Models of Agency Problems

We now turn our attention to agency-based models of payout policy. Many of the potential conflicts of interest within the firm may interact with payout policy. An important focus of the finance literature has been how payout policy is affected by, and how it affects, the conflicts of interest between management and shareholders (referred to as the free cash flow problem; see, e.g., Jensen & Meckling 1976, Easterbrook 1984, Jensen 1986), although this, of course, is not the only possibility. Dividends and repurchases may interact with possible conflicts of interest between majority and minority shareholders, between shareholders and debtholders (e.g., Myers 1977), or between shareholders and the labor force. These other conflicts have been studied empirically as well.

In the traditional agency models, dividends and repurchases can be used as a disciplinary device that reduces the extent to which managers can funnel resources away from shareholders. Payouts reduce cash holdings (assuming that the firm does not replenish the funds via securities issuances), and lower cash holdings may help limit managements' (a) consumption of perks, (b) ability to invest in privately beneficial but negative NPV projects (e.g., a new corporate jet), and (c) ability to go on spending sprees such as unmonitored mergers (e.g., Grossman & Hart 1980, Easterbrook 1984, Jensen 1986, Zwiebel 1996). One of the important features of these models is that they show the tight connection existing between payout policy and value creation by way of good investment decisions. When firms have financial slack, managers have the ability to invest in pet projects, which will not necessarily raise the value of the firm. Taking cash away forces firms to make more prudent investment decisions. Along the same lines, Easterbrook (1984) argues that when firms have good investments they should go to the capital markets and raise capital. Easterbrook's is a rare model in which firms (almost) simultaneously pay dividends and go to the capital markets to raise capital in equilibrium.

These arguments are intuitively appealing and receive significant support from the empirical literature, as we review below. But, at the same time, they leave several important questions unanswered. First, what is the mechanism driving management to commit to an action (e.g., increase payout) that will prevent them from investing in negative NPV projects? Perhaps it is the market for corporate control (e.g., Zwiebel 1996) or internal governance mechanisms that are imposed by regulators, such as the Sarbanes Oxley Act of 2002 (e.g., Chhaochharia et al. 2014). Or is it the board of directors that drives the change in payout policy? And, if the board can impose these mechanisms, why can it not simply monitor and control management's actions directly and more effectively, rather than do it indirectly via imposing a high payout?

Along the same lines, La Porta et al. (2000) further develop the idea that dividends can be either a substitute to other governance mechanisms or a complement. If external corporate governance mechanisms allow the board to impose a payout policy that helps limit managers' excessive spending, then these two types of devices are complements: Strong governance enables equityholders to impose a payout policy that reduces management's ability to invest suboptimally. If, however, the board feels that there are enough other corporate governance elements in place to control management's behavior, then these two can be viewed as substitutes. Indeed, Allen, Bernardo & Welch (2000) construct an interesting framework that builds on the idea that some

institutional investors (who prefer dividends for tax reasons) represent the external governance mechanisms that interact with dividends. The presence of institutional investors increases the value of the firm because of the monitoring role they play, and because they help facilitate takeover activities (even if they are not directly involved in them). Thus, the board has an incentive to induce these shareholders to take a position in the firm, especially if the firm is likely to have excess cash. This setting suggests interesting dynamics between governance and payout. Several papers have recently examined these relations empirically (e.g., Grullon & Michaely 2012; Hoberg, Phillips & Prabhala 2014; Crane, Michenaud & Weston 2014). We review these studies below.

Another interesting question that is left unanswered is to what extent the desire to use payout policy as a disciplinary device affects the decision regarding the form of payout: dividends or repurchases? On the face of it, they seem to be perfect substitutes. However, if we take as given that dividends are stickier than repurchases (an assumption with strong empirical support), then dividends are a better (i.e., more credible) monitoring device because they cannot be easily reversed. One can take this argument a step further and suggest that dividends are a better controlling device for recurring cash flows and repurchases are a better mechanism to pay out one-time cash flows (Jagannathan, Stephens & Weisbach 2000; Guay & Harford 2000).

### 5.3. Modeling Dividend Smoothing

We now review several theories focused on explaining one of the most salient empirical regularities of dividends: their smoothness. Kumar (1988) and Guttman, Kadan & Kandel (2010) offer models in which the dividend serves as a signal of managers' private information about current or future cash flows. However, unlike similar models used to explain the existence of dividends (e.g., Bhattacharya 1979, John & Williams 1985, Miller & Rock 1985), these authors show the existence of partially (but not fully) revealing equilibria. Firm types within a certain dividend range pool with each other and separate from firms outside that range. Dynamic extrapolations of these models can then generate dividend smoothing: The wider the ranges over which firms pool, the greater the likelihood of smoothing.

Fudenberg & Tirole (1995) and DeMarzo & Sannikov (2014) present optimal contracting models in which information asymmetry between a firm's owners and its managers generates dividend smoothing behavior. As Fudenberg & Tirole (1995) explain, the principal forms expectations of future cash flows based on the agent's income or dividend reports, while placing more weight on recent reports than older ones. To minimize the risk of being fired, the manager then has an incentive to under-report good outcomes so that she can over-report if there is a future adverse shock. DeMarzo & Sannikov (2014) study a principal-agent setting in which output carries information about both effort and future profitability. In this setting, the agent may manipulate investors' expectations by affecting current output through effort. In their optimal contract, young firms are financially constrained, do not pay dividends, and may be liquidated inefficiently. If the firm survives and accumulates sufficient financial slack, it initiates dividends, which are smooth relative to earnings because earnings surprises are fully absorbed into cash balances, thus keeping the level of financial slack in line with the expectation of future profitability.

Acharya & Lambrecht (2014) develop a theory of income and payout smoothing by firms when insiders know more about income than outside shareholders, but property rights ensure that outsiders can enforce a fair payout. Insiders set the payout level to meet outsiders' expectations and under-produce to manage downward future expectations. As a result, the observed income and payout processes are smooth and adjust partially and over time in response to economic shocks.

Another way in which asymmetric information may lead to dividend smoothing is through the relationship between financial constraints and cash holdings (e.g., Almeida, Campello &

Weisbach 2004; Bates, Kahle & Stulz 2009). That is, firms for which external finance is costly will be reluctant to increase dividends, even following a positive earnings shock. However, financial constraints cannot explain why firms are so reluctant to cut dividends when funds are scarce.

We now turn our attention to papers in which smoothing arises as a means of controlling the agency costs of free cash flow. In Allen, Bernardo & Welch (2000), institutional investors are valued for their monitoring abilities. Managers can use dividends to attract these investors because of their differential tax status compared to individual investors. Once institutional investors have been attracted, they have the ability to impose a large penalty in response to dividend cuts, so managers are forced to smooth their dividends. Similarly, Easterbrook (1984) and Jensen (1986) suggest that paying a dividend that is both high and smooth forces firms to raise external capital to meet any financing needs. This continual exposure to the discipline of external financial markets reduces agency costs.

In these models, greater susceptibility to free cash flow problems leads to both higher levels of dividends and more smoothing. Allen, Bernardo & Welch (2000) additionally predict an association between smoothing and institutional shareholdings. Because dividend smoothing and institutional holdings are alternative mechanisms for controlling agency problems, they could be considered substitutes or complements (La Porta et al. 2000). However, as Allen, Bernardo & Welch (2000) explain, the presence of institutional investors reinforces the high dividend policy, so they are predicted to be complementary mechanisms. Whether dividend smoothing (or dividends more generally) and institutional holdings serve in practice as complements or substitutes is ultimately an empirical question that has not yet been settled in the literature.

Lambrecht & Myers (2012) show how managerial rent-seeking behavior can generate smooth dividends. In Lambrecht & Myers' model, shareholders demand a regular dividend to limit agency costs, but their costs of collective action allow the manager to extract rents. Risk aversion and habit formation in the manager's utility function lead her to desire a smooth stream of rents, which, in turn, requires a smooth stream of dividends. Although the level of dividends increases as shareholder rights weaken, the degree of smoothing is primarily a function of the manager's habit persistence.

Lambrecht & Myers (2014) build on Lambrecht & Myers (2012) but allow investment to be endogenous. (Lambrecht & Myers 2012 model the capital stock as fixed.) This allows Lambrecht & Myers (2014) to show that, even if investment is very lumpy or volatile, payout and managerial rents remain smooth. This smoothness is partially achieved through time-varying, procyclical precautionary cash savings. (Precautionary cash savings are constant when the capital stock is fixed.)

The empirical evidence Leary & Michaely (2011) present, which we discuss in Section 2.3, appears most consistent with agency models of smoothing. Indeed, Leary & Michaely show that smoothing is most pronounced among firms with a high potential for agency costs (e.g., mature cash cows with few investment opportunities), high dividend levels, and high institutional holdings. In addition, Michaely & Roberts' (2012) findings (also reviewed in Section 2.3), as well as Section 2.4's discussion of international evidence, also appear most consistent with agency-based theories of smoothing.

## 5.4. Empirical Findings

**5.4.1. Market response to payout changes.** What are the important predictions of the agency and signaling models? Perhaps the most obvious one is that the market response to changes in payouts should be in the same direction as the change in payout. An announcement of an unexpected dividend increase should be greeted by a positive market response, and vice versa. Empirical

researchers have documented this pattern. For example, Grullon, Michaely & Swaminathan (2002) find that the average abnormal return to dividend increases is 1.34% (a median of 0.95%), and the average abnormal market reaction to dividend decreases is -3.71% (a median of -2.05%). The market reaction to initiations and omissions is even more pronounced (e.g., Healy & Palepu 1988). More recently, Michaely, Thaler & Womack (1995) estimate that the average excess return is 3.4% for initiations and -7% for omissions. Repurchase announcements exhibit a similar pattern, though the magnitude of the market response is larger than for dividend increases. Using a sample of share repurchases between 1980 and 1997, Grullon & Michaely (2004) calculate an average market response of 2.7% to repurchase announcements. The market reaction is positively related to the change in the amount of dividends or repurchases that were announced. Although this empirical observation is consistent with both agency and signaling explanations, it is also consistent with other potential explanations, including behavioral ones. The above studies do not distinguish between these explanations.

**5.4.2. Operating performance after payout changes.** The second important implication of payout signaling theories is that increases in payout will be followed by improvements in operating performance. We know that firms that increase their dividends (or repurchases) have done well in the past (in terms of operating performance and stock performance), and firms that have cut dividends have been doing poorly. For example, Benartzi, Michaely & Thaler (1997) document an average 8.6% (-28%) abnormal return in the year prior to a dividend increase (decrease). So dividends clearly signal the past, but do they also signal the future as the theory suggests? This issue was a subject of debate for a while. Brickley (1983), Healy & Palepu (1988), and Nissim & Ziv (2001) find a significant earnings increase in the year of and the year after the dividend increase. However, Watts (1973), Gonedes (1978), and Penman (1983) find that little information about future earnings is conveyed by dividend changes. Perhaps we can attribute the somewhat mixed results on the relation between current changes in dividends and future changes in earnings to the small samples used in most of these studies. Another factor that makes the task difficult is the challenge of modeling unexpected earnings.

Benartzi, Michaely & Thaler (1997) investigate the relation between dividend changes and future changes in earnings, using several definitions of earnings innovations. They measure earnings changes relative to the industry average of changes in earnings, adjusted for earnings momentum and mean reversion in earnings. Two robust results emerge. First, there is a very strong correlation between lagged and contemporaneous dividend changes and earnings changes. When dividends are increased earnings have gone up. There is no evidence, however, of a positive relation between dividend changes and future earnings changes. In the two years following a dividend increase, earnings changes are unrelated to the sign and magnitude of the dividend change. In a differing setting, DeAngelo, DeAngelo & Skinner (1996) examine firms that experience a decade of earnings growth followed by a year of decline. Their test focuses on the year zero dividend decision (the year of the earnings decline), which may help the market to assess whether the decline in earnings is permanent or transitory. They find no evidence that a favorable dividend decision (i.e., a dividend increase) represents a reliable signal of superior future earnings performance. The results on dividend decreases are strong but unexpected: Both Healy & Palepu (1988) and Benartzi, Michaely & Thaler (1997) find a clear pattern of earnings increases in the two years following a dividend cut.

Similar to studies of dividend changes, Grullon & Michaely (2004) find that announcements of open-market share repurchase programs are not followed by an increase in operating performance. All in all, the accumulated evidence does not support the assertion that dividend changes convey information about future earnings. Miller (1987) summarizes the empirical findings this

way: “. . .dividends are better described as lagging earnings than as leading earnings.” Current research continues to support Miller’s assertion.

**5.4.3. Cross-sectional evidence on payout policies.** The third relevant empirical fact is that most dividends are paid by firms that are large and relatively stable (DeAngelo, DeAngelo & Skinner 2004). These are also firms that experience slower growth (Grullon, Michaely & Swaminathan 2002; DeAngelo, DeAngelo & Stulz 2006). Grullon, Michaely & Swaminathan (2002) examine the relation between changes in dividend policy and changes in the risk and growth characteristics of the firm. They find that firms that increase dividends experience a significant decline in their systematic risk, whereas firms that decrease dividends experience a significant increase in systematic risk. Firms that increase dividends also experience a significant decline in their return on assets, which indicates a decline in systematic risk. Moreover, capital expenditures of firms that increase dividends stay the same and the levels of cash and short-term investments on their balance sheets decline, consistent with the decreasing risk hypothesis. As discussed in Section 2.1, DeAngelo, DeAngelo & Stulz (2006) further investigate the relationship between dividend policy and firm maturity (or lifecycle stage). They find a monotonic relation between the fraction of dividend payers in the economy and growth opportunities (estimated by the portion of retained earnings relative to total equity), consistent with the changing role of dividends in the lifecycle of firms. Incidentally, these firms—large, mature, not in the growth cycle—are the types of firms that are more likely to be concerned with agency and free cash flow problems rather than with asymmetric information and signaling.

There are also several more direct tests of dividend signaling, and especially using John & Williams’ (1985) model. Recall that differential taxes between dividends and capital gains are the reason why dividends can serve as a costly signal in that model. Bernheim & Wantz (1995) investigate the market reaction to dividend changes during different tax regimes. In periods when the relative taxes on dividends are higher, the signaling hypothesis implies that the market reaction to dividend increases should be stronger, because it is more costly to pay dividends. Consistent with this signaling hypothesis, Bernheim & Wantz find that, in periods of higher relative taxes on dividends, the market reaction to dividend payments is more favorable. However, applying nonparametric techniques that account for the nonlinear properties common to many dividend signaling models, Bernhardt, Douglas & Robertson (2005) do not find evidence to support the notion that taxes serve as a costly signal. Amihud & Murgia (1997) examine dividend policy in Germany, where dividends are not tax disadvantaged. They find that dividend changes in Germany generate a stock price reaction that is very similar to the reaction typically found in the United States, despite the difference in relative tax treatment. Thus, their findings are inconsistent with tax-based dividend signaling theories.

The above papers present an interesting thought experiment that can (and should) be carried further. For example, there have been several significant tax changes in the past 30 years. Keeping in mind the caveats discussed before, these tax changes could potentially be used as exogenous shocks to investigate the implications of both signaling and agency theories to both the market response and the supply of dividends before and after the tax changes. These can be promising avenues for future research.

Following La Porta et al. (2000), research started to pay closer attention to the interaction of dividends with other governance mechanisms. A key objective is to determine whether dividends and other governance mechanisms are substitutes, or whether shareholders need these other governance mechanisms to be able to impose a dividend policy to discipline management. In the latter case, dividends and these governance mechanisms can be seen as complements. Grullon & Michaely (2012) investigate the link between product market competition, managerial incentives,



and corporate payout policy. There are several potential reasons why product market competition and payout policy might be related. Perhaps the most important one is the interaction between competition and agency conflicts. It is possible that product market competition, through its effect on agency conflicts, may be an important determinant of the decision to pay out excess cash to shareholders. One possibility is that firms pay dividends because competition acts as an enforcement mechanism that exerts pressure on managers to distribute cash to their shareholders by increasing the risk and the cost of overinvesting (e.g., higher probability of liquidation, greater transparency). Alternatively, payout policy can be a substitute for competition: Managers could use dividends as a substitute for the discipline imposed by competition to establish good reputation in the capital markets to be able to raise capital on better terms.

Grullon & Michaely (2012) find that firms in more concentrated industries have significantly lower dividend payout ratios and are less likely to increase dividends compared to firms in less concentrated industries. This result suggests a complementarity between competition and dividends. For several reasons, competitive markets enable boards to implement a dividend policy that is more aligned with shareholders' interests (e.g., because the firm's dividend policy can be readily compared to its peers' policies). As in many of these types of studies, omitted correlated variables are a significant concern. To this end, Grullon & Michaely use the adoption of business combination (BC) laws to examine how agency problems affect the relation between corporate payouts and product market competition (an experiment similar in spirit to Giroud & Mueller 2010). Because these laws substantially reduce the chance of hostile takeovers, they increase the opportunity of managerial misbehavior. It follows that the effect of product market competition on dividend policy should become stronger after the passage of the BC laws. The reason for this is that the market for corporate control is an external factor that serves as a substitute for the lack of product market competition (Giroud & Mueller 2010). Consequently, managers in less competitive markets should become more entrenched after the adoption of the BC laws than managers in more competitive markets and this, in turn, should lead to a larger differential in payout ratios between firms in concentrated markets and firms in competitive markets. Consistent with such agency predictions, Grullon & Michaely find that the negative relation between industry concentration and dividend payout ratios becomes much stronger after the passage of the BC laws. These results are consistent with La Porta et al.'s (2000) conceptual framework in which dividends are the outcome of external disciplinary mechanisms (in this case, the disciplinary role of competition). Thus, dividends and these external governance mechanisms can be seen as complements.

Recall that in Section 3 we stated competitive product markets as one of Miller & Modigliani's (1961) elements of perfect and complete capital markets. The work of Grullon & Michaely (2012) described earlier captures how the extent of product market competition interacts with payouts vis-à-vis agency considerations. Product market competition and payout policies may be related for an additional reason: Firms in more concentrated markets may pay lower dividends because they need to hoard cash to fend off predatory behavior from competitors, as Bolton & Scharfstein (1990) describe. In other words, in situations where product markets are less stable and firms are subject to competitive threats by rival firms, cash may be more valuable and payout policy becomes more conservative. (This view of product markets is also consistent with the disciplinary role of competitive markets being a substitute for dividends.) Using data from firms' Form 10-K filings, Hoberg, Phillips & Prabhala (2014) first construct a new text-based measure of competitive threats faced by a firm in its product market. They find that firms facing changes in their product markets have a lower propensity to pay dividends or repurchase shares. These firms also pay lower dividends. Their results suggest that the impact of product market fluidity on dividends is more acute than it is on repurchases. To the extent that product market fluidity is akin to competition, these results differ from Grullon & Michaely's (2012), perhaps because of the different measures of



competition, or because of the different cross-sectional coverage. Understanding the causes behind Grullon & Michaely (2012) and Hoberg, Phillips & Prabhala's (2014) seemingly contradictory results could be a fruitful avenue for future research.

There are still significant disagreements in the literature regarding how corporate governance affects payout policy and not everyone agrees with La Porta et al. (2000) and Grullon & Michaely's (2012) conclusions of complementarity between corporate governance and dividends. Consistent with the implications of the substitution model, several recent papers find evidence supporting the notion that firms use dividend payments to reduce agency costs that are caused by poor governance. For example, Officer (2011) uses board size and CEO/chairman duality as proxies for internal governance, and John & Knyazeva (2006) use Gompers, Ishii & Metrick's (2003) index as a proxy for external governance. Both studies find that firms that are categorized as good governance firms pay lower levels of dividends. Further, Grinstein & Michaely (2005) find that firms with high institutional holdings (an external governance proxy) generally pay lower dividends.

Crane, Michenaud & Weston's (2014) findings disagree with the notion that institutional investors restrict corporate dividends. Their identification strategy is based on a discontinuity in institutional ownership based on changes in the annual composition of the Russell 1000 Index and the Russell 2000 Index. At the margin, this discontinuity represents random exposure to higher institutional ownership. The authors find that higher institutional ownership causes firms to pay more dividends and repurchase more shares. Overall, their results are consistent with agency models that emphasize a complementarity between governance and dividends (e.g., La Porta et al. 2000). More recently, Mullins (2014) investigates the same setting but uses a proprietary market capitalization measure that is used by Russell Indexes to determine index assignment. This cleaner measure was not available to Crane, Michenaud & Weston. Using this cleaner measure, Mullins reports that the positive relation between institutional holdings and payout disappears and is even reversed in some specifications. The relationship between institutional investors and dividend policy is clearly an important research topic that deserves further attention.

## 5.5. What Do Managers Say About Payout Policy?

The fourth set of relevant empirical stylized facts is what managers say about these motivations. Brav et al.'s (2005) survey and interviews of CFOs shed light on several aspects concerning the relevance of agency, signaling, and other asymmetric information considerations to payout decisions. First, when describing the dividend decision process, most managers suggest that it is them who determine the appropriate level of dividends or share repurchases, and only later the board approves their decision. Thus, the action is initiated within the firm, which is perfectly in line with the asymmetric information/signaling models. It does pose a challenge to agency models given that the agent and not the principal makes the decision that is supposed to force the agent to "behave." However, of course the agent will only propose payout levels that the principal is likely to approve. For instance, consider the case of Carl Icahn and Apple (Benoit 2013). As is evident from the public letters by Icahn pressing Apple to accelerate and increase in scope its share repurchase program, Icahn had been pushing Apple to increase its payout for a while. And, although it is likely correct that it was eventually Apple's management that decided on a substantial increase in payout, this increase was in response to the outside pressure. This pressure can be explicit, as in the case of Icahn and Apple, or can be more subtle and more implicit. That said, we believe that agency models should pay more attention to the setting and process of how payout decisions are made.

The second observation coming out of the survey is that the basic assumption of agency models (e.g., Jensen 1986; Allen, Bernardo & Welch 2000) and many signaling models (e.g., Miller & Rock 1985) seems to hold: Managers argue that dividend choices are made simultaneously with investment decisions, which represents not just a question of timing but of priorities. Dividends are not the residual: Managers state that they would pass up positive NPV investment projects before cutting dividends. It is worth noting that managers do not make the same claim about repurchases. This distinction seems to be a significant element that distinguishes these two methods of payouts. As argued in Section 2.2, it also indicates that although dividends and repurchases may be substitutes, they are not perfect substitutes (consistent with the empirical findings of Jagannathan et al. 2000, Guay & Harford 2000, and Grullon & Michaely 2002).

A third, related observation from the survey is that dividends are viewed as a binding mechanism. Sixty-five percent of dividend payers strongly agree that external funds would be raised before cutting dividends. In contrast, managers say that they will not raise external equity to avoid a reduction in repurchases. These observations are consistent with both the disciplinary role of dividends (Easterbrook 1984) and signaling theories (Bhattacharya 1979). They also provide further evidence that the motivations for repurchases are not only signaling and agency. (We have discussed tax motivations in Section 4, and discuss alternative motivations in Section 6.)

Fourth, managers do not think that they can attract institutions as shareholders or increase institutional holdings by paying more dividends relative to repurchases. The CFOs do not indicate that they believe institutions as a class prefer dividends over repurchases, except perhaps the existence of a small dividend payout that is needed to attract certain types of institutions (see Grinstein & Michaely 2005). In this sense, this view is not consistent with the setting in Allen, Bernardo & Welch (2000), in which managers of undervalued firms increase dividends to attract institutions.

Fifth, although a notable minority of managers says that money can “burn a hole in our pockets,” most executives do not view payout policy as a means of self-imposing discipline. Of course, this self-reported assessment neither proves nor disproves whether payouts can be usefully thought of as a disciplining device.

Sixth, 80% of executives believe that dividend decisions convey information to investors. Similarly, repurchases are thought to convey at least as much information as dividends (despite their flexibility). Consistent with our discussion earlier in this section, some interviewed managers believe that the information conveyed through dividends is not mainly about the level of earnings but it is about the second moment of the distribution of earnings. In particular, managers see a connection between risk reduction and dividend increases.

However, managers object to the notion of using dividends as a money burning machine to signal value. Only 4.4% of managers agree with this premise, which draws the weakest support for any dividend motivation in the survey. Thus, managers do not consciously use dividends (or repurchases) as a costly signal. Managers also disagree with the idea that they use dividends to show that they are strong enough to bear the cost of acquiring external capital if needed (Bhattacharya 1979); to show that their stock is valuable enough that investors should buy it, even though they have to pay relatively costly dividend taxes (John & Williams 1985); or to show that their firm is strong enough to pass up profitable investments.

Overall, Brav et al.’s (2005) interview and survey evidence supports the idea that payout policy conveys information, but it does not support the notion that firms try to signal their true worth and separate themselves from their peers through dividend signaling. Combining this survey evidence with the accumulated empirical evidence described earlier, we conclude that there is little empirical support for the signaling hypothesis.

## 6. ALTERNATIVE MOTIVATIONS FOR PAYOUTS

This section reviews motivations for payouts other than the more traditional motivations, such as taxes, the mitigation of agency problems, and signaling with dividends, which are reviewed in Sections 4 and 5. We start with papers on the relationship between repurchases and the liquidity of the market for the firm's stock. Then, we discuss whether the market learns new information from repurchases, as well as long-run returns to repurchase and dividend announcements. Several recent papers report that positive abnormal returns around payout announcements are also present in non-US markets, indicating robustness of previous results in the United States. But do managers try to time the market with their repurchases? The most recent evidence from actual repurchases indicates that managers are able to time the market to a lesser degree than seems necessary for market timing to be the central motivations for most of the observed payouts. We also briefly discuss repurchase waves and peer effects in payout policy in Section 6.1.

Section 6.2 discusses papers that investigate to what extent variation in the degree of alignment of management and shareholder incentives can explain variation in payout policies across firms. Empirically, several papers find that executive compensation with options is related to a higher incidence of repurchases and that these repurchases substitute dividends. Given that dividends decrease the value of options (except in the rare case that the options are dividend protected), this evidence indicates that managers' private incentives shape payout policy. Importantly, an increasing number of authors, on the basis of this evidence, suggest that changes in compensation practices may be a driver of the increased incidence of repurchases. This suggestion is important as it hints that the interaction between compensation and payout policy may have the potential to explain some of the secular trends in payout policy without resorting to mispricing and managerial timing ability as an explanation.

Papers reviewed in Section 6.3 investigate the compensation channel more broadly by investigating whether nonexecutive employee compensation interacts with payout policy. Specifically, a burgeoning literature posits that public firms' managers care deeply about meeting EPS targets. At the same time, issuance of stock to employees, e.g., when they exercise stock options, dilutes EPS. Combining these insights suggests that the exercise of employee stock options and employee stock purchase plans could be an important driver of both cross-sectional and time-series variation in repurchase activity.

Finally, Section 6.4 reviews the literature on the recent phenomenon of ASRs.

### 6.1. The Interaction Between Payouts and the Market for the Underlying Stock

This section reviews two mechanisms that can lead to a relationship between payout policy and the market for the underlying stock of the firm. The first mechanism is an interaction between payout policy and market liquidity; the second reflects the idea that managers can exploit mispricing of their stock with an appropriate payout policy.

**6.1.1. Improving market liquidity as a motivation for repurchases.** Miller & Modigliani's (1961) irrelevance of the choice between dividends and repurchases relies on the notion that investors can consume out of capital gains just as well as out of dividends. That argument assumes that selling stockholdings comes without a significant cost to the investor. However, such costs are incurred in practice, especially by individual investors. They may incur pecuniary transactions costs (a rational explanation), costs of effort of trading, or a psychological cost associated with determining how much to consume (a behavioral explanation). That actual (as opposed to psychological) transactions costs have decreased over the decades is qualitatively consistent with the secular decrease of

dividends as the form of payout (Jones 2002) but does little to explain the reappearing dividends after 2003. Also, for transactions costs to be the driver of this development, it would need to be true that individual investors are the drivers of payout policy, which is less likely given the increase over time in the share of institutional holdings.

In regard to cross-sectional variation, a younger literature has developed around the idea that repurchases can be motivated by a firm's desire to increase the market liquidity of its stock and, thus, reduce transactions costs. As a motivating example, following the crash of 1987, many companies bought back their own stock. A sizable literature has since investigated the impact of repurchases on the market liquidity of a firm's stock. However, the limited availability of data on actual repurchase has been a major constraint and, as a result, the literature has not yet come to a consensus regarding the direction of the impact of firms' trading in their own stock on stock liquidity, let alone converging to a consensus on the quantitative importance of this idea.<sup>12</sup>

Chemmanur, Cheng & Zhang (2010) find that the announcement of repurchases alone increases stock liquidity. Cook, Krigman & Leach (2004) investigate a sample of repurchase trades of 64 US firms and find that the timing of repurchases tends to improve liquidity. In contrast, Barclay & Smith (1988) argue and offer suggestive empirical evidence that the increase in asymmetric information induced by managers' trading in their own shares during repurchases increases bid-ask spreads.<sup>13</sup> Using detailed actual repurchase data from Hong Kong, Brockman & Chung (2001) show that bid-ask spreads widen when a company trades in its own shares. Ginglinger & Hamon (2007) utilize actual repurchase data from the French market and find that repurchases have a significant negative effect on bid-ask spread and depth. Ben-Rephael, Oded & Wohl (2014) find better timing ability in more liquid markets, suggesting that repurchasing firms consume rather than provide liquidity.

Taking as given that repurchases improve liquidity, recent papers have investigated whether firms' repurchases are indeed conducted to improve liquidity (and increase the price in case of undervaluation) of their own stock. Hong, Wang & Yu (2008) find supporting evidence by confirming asset pricing predictions of a model that assumes that repurchases are conducted in certain situations to stabilize the stock price. Their model predicts that firms that have the financial strength to intervene when their stock is becoming substantially mispriced should have lower short-horizon return variance compared to firms with lower ability to intervene. The empirical implementation of the tests relies on standard measures of financial constraints the corporate finance literature has used. Because the paper tests the model's asset pricing implications, the results are not a direct test of whether repurchases are conducted to stabilize the market for the underlying stock. However, to the extent that the model predictions are unique to the assumptions, we could count the empirical support the authors find for the implications of their model as evidence for the accuracy of the assumptions. However, there could be other explanations for why firms that the authors identify as less financially constrained exhibit lower short-run return variance. For example, the traditional corporate finance measures of financial constraints typically load heavily on size, and the information environment of large firms is clearly different in observable and unobservable ways than the information environment of small firms.

---

<sup>12</sup>Huang & Thakor (2013) offer an interesting alternative explanation in which management uses repurchases to affect a firm's investor base by buying shares from investors that disagree with its investment policy (and consequently also have a negative impact on its price). They find evidence consistent with firms strategically using repurchases to improve alignment between management and shareholders.

<sup>13</sup>New theoretical advances indicate potential flaws with that reasoning. Kruger (2013) shows that, in contrast to the intuition from traditional models such as Akerlof's (1970), in the presence of differences in beliefs increased asymmetric information might actually increase trading volume.

de Jong, Dutordoir & Verwijmeren (2011) propose a rather novel and creative version of the hypothesis that firms repurchase stock to provide liquidity and reduce transactions costs for investors. They provide institutional detail and empirical evidence indicating that issuers of convertible bonds simultaneously repurchase shares to facilitate short selling of their shares by arbitrageurs.

**6.1.2. Equity mispricing as a motivation for payouts.** Systematic mispricing of equity violates Miller & Modigliani's (1961) assumption of frictionless capital markets. Relaxing this assumption by allowing managers to more accurately assess their own firm's value may give firms an incentive to increase their stock price through repurchases. A long literature has tested the mispricing hypothesis in several ways: first, by testing whether the market reacts to undervaluation signals as evidenced by post-repurchase announcement returns in the short term and the long term; second, by investigating whether firms are able to time the market for their own shares in their actual repurchase behavior; and, third, by measuring mispricing and the divergence between manager and market beliefs in more direct ways.

The predominant view arising from the positive repurchase announcement returns documented by Vermaelen (1981) and Dann (1981) has been that announcements of repurchase programs via the open market or tender offers contain information about firms' undervaluation. As the immediate market reaction to such announcements is positive, the authors conclude that the evidence points to semi-strong form efficiency of the stock market. Supporting the view that the market rationally responds to such information, Babenko, Tserlukevich & Vedrashko (2012) show that announcement returns are greater for firms whose insiders personally purchase stock before the announcement. That corporate executives state undervaluation of their stock as a significant motivation for repurchases further strengthens the view that undervaluation is a driver of repurchases (Brav et al. 2005).

To a certain extent, Lakonishok & Vermaelen (1990) challenge the view that markets efficiently respond to the information contained in repurchase announcements by showing that stocks of firms that announce fixed-price tender offers exhibit large long-run abnormal returns. That is, the market seems to underreact to repurchase announcements in the short run. Ikenberry, Lakonishok & Vermaelen (1995) show that the market also offers long-run excess returns for holding stocks of firms that announce open-market repurchase (OMR) programs. It is clear from this literature that in the 1980s and 1990s, there are positive and significant announcement returns both in the short and the long run to firms announcing repurchase programs. However, Fama (1998) points out problems with the interpretation of these results: The samples are small and short and, therefore, possibly a statistical anomaly, and econometric issues may have led to biased results. Thus, the evidence on the information content of repurchase announcements to this point must be regarded as not entirely robust.

Similar to the results on the market reaction to repurchase announcements, several studies find that the market does not incorporate immediately all the information contained in dividend change announcements. Examining the two years following dividend announcements, Charest (1978) finds a 4% abnormal return for dividend-increasing firms and a negative 8% abnormal return for dividend-decreasing firms. Using the Fama-French three-factor model, Grullon, Michaely & Swaminathan (2002) report a three-year abnormal return of 8.3% for firms announcing a large dividend increase, but no abnormal performance for dividend-decreasing firms. Even stronger results are obtained for omissions and initiations. Michaely, Thaler & Womack (1995) report a market-adjusted return of almost 25% in the three years after initiations and a negative abnormal return of 15% in the three years after omissions. Similar to the evidence for repurchase announcement returns, the dividend announcement initial market reaction combined

with the post-dividend-announcement drift suggests that dividend changes contain news. It also suggests that the market does not get the full extent of the information contained in the news. Otherwise, the entire price reaction would have happened immediately after the announcement. Thus, the evidence indicates that the full rationality assumption is violated in practice for both repurchase and dividend announcements, or that we measure expected returns incorrectly.

As mentioned above, several studies in the 1990s have challenged the robustness of repurchase anomalies, i.e., abnormal repurchase announcement returns, on grounds of limited sample sizes, among other things. Responding to such challenges, Rau & Vermaelen (2002) find that UK firms earn less abnormal returns upon repurchase announcement than previous US-specific studies indicate. However, they argue that the weaker response occurs because UK firms cannot use superior information to buy back shares as well as their American counterparts because of regulatory constraints. Several papers on repurchases in Japan and Germany, in contrast, argue that tighter regulation there causes stronger repurchase announcement returns (e.g., Hackethal & Zdantchouk 2006, Wada 2005). Supporting the general view that the market infers misvaluation from repurchase announcements, Kahle (2002) finds that the market reacts less to repurchases whose purpose is more likely to be offsetting dilution from employee stock option exercise. Intending to support the robustness of previous findings, Peyer & Vermaelen (2009) use an updated dataset to reject that US buyback anomalies have disappeared. They explain the persistence of these so-called anomalies with an irrational market overreaction to bad news prior to repurchases.

As the degree of misvaluation is fundamentally difficult to measure, the literature relies on proxies for undervaluation in its attempt to provide support for the basic tenets of the undervaluation hypothesis for repurchases. An early example is Jagannathan, Stephens & Weisbach (2000), who find that bad prior stock price performance is related to repurchase activity and that firms with higher cash flows repurchase more. They interpret these relationships as evidence that both mispricing and the distribution of excess liquidity are important drivers of repurchases. Using data between 1977 and 1996, Dittmar (2000) finds similar evidence using a slightly different methodology. The main analysis in her paper consists of regressing actual repurchases (rather than repurchase announcements) on several firm-level variables such as market-to-book ratios, cash levels, size, or recent stock returns. Each of these variables serves as a proxy for a particular motivation. For example, low prior stock returns are viewed as evidence for undervaluation. A negative coefficient on recent returns would then indicate that repurchases are conducted when a firm is believed to be undervalued. Using this methodology, she finds evidence, among other things, for the mispricing hypothesis, but notices that the importance of this motivation for explaining repurchases varies substantially over time.

D'Mello & Shroff (2000) analyze whether repurchasing firms' stock is mispriced following a different approach. They compare the stock price before the repurchase announcement to a benchmark price that is constructed using future accounting information. The idea is that management likely had a good sense about future firm performance and possibly a better sense than the market. If so, a wedge between the current stock price and the benchmark price should predict repurchase activity. Using this approach, the authors find that a majority of firms that repurchase via fixed-price tender offers were indeed undervalued at the time.

In sum, several papers have attempted to measure whether the stock of repurchasing firms is actually mispriced. This approach is heavily dependent on how the fair value of a firm's stock is measured, and it has offered mostly mixed support for the misvaluation hypothesis.

The logic that managers repurchase shares when their firms are undervalued relies on the notion that managers are reliably able to identify mispricing. Investigating this assumption is a challenging task, as US firms were not required to disclose trades in their own stock with



sufficient precision to be able to calculate the price they paid when repurchasing their stock, which could then be compared to the average stock price around that period. Brockman & Chung (2001) look at a sample of more than 5,000 actual repurchases by 190 firms in Hong Kong, whose stock exchange already then required firms to disclose the days on which they implemented a buyback. They find strong evidence for timing ability. The external validity of these results is, of course, more difficult to establish. Closer to the United States, both geographically and in its institutional environment, Canada also requires disclosure of actual repurchase activity, albeit only at a monthly frequency. Ikenberry, Lakonishok & Vermaelen (2000) exploit this feature and conclude that mispricing is an important motivation for repurchases also in Canada. However, they have to proxy for the repurchase price, as companies are only required to file volume, but not repurchase prices.

Cook, Krigman & Leach (2004) examine a sample of 64 US firms with repurchase trading data and find that managers of NYSE-listed firms are able to time the market on average, whereas those listed on NASDAQ do not have timing ability. In addition, they find that repurchasing decreases bid-ask spreads. As their results regarding the market impact of repurchase activity are in discordance with Brockman & Chung's (2001) and their sample size is small, the external validity question of their and previous results remains open.

Peyer & Vermaelen (2005) analyze targeted repurchases in the United States. They find that only those repurchases executed to fend off takeovers are associated with the corporation overpaying for its stock; all others come with positive long-run announcement returns similar to the pattern observed for OMRs.

Instead of inferring repurchasing firms managers' beliefs from their repurchase behavior, Chan, Ikenberry & Lee (2004) investigate beliefs of repurchasing firms' investors. If these beliefs were systematically too pessimistic at the time of repurchase announcements, the undervaluation hypothesis would gain support. The authors indeed find that earnings announcements after repurchase announcements tend to be better than expected by analysts. Under the assumption that analysts' beliefs correspond to the beliefs of the marginal investor, this evidence supports the hypothesis that firms repurchase stock because they are undervalued.

The studies that follow take a more differentiated view on repurchases. Louis & White (2007) emphasize the distinction between the two ways in which firms could react with their payout policy to an undervaluation of their stock. One is to announce a repurchase program in the hope that the market undoes the mispricing in response to the announcement itself. The other is to conduct actual repurchases with the aim of exploiting the mispricing to the benefit of existing shareholders. The authors offer evidence for each. They find that fixed-price tender offers are used to signal undervaluation. In contrast, Dutch auctions are used to reduce the repurchase price, i.e., they exacerbate the mispricing to the benefit of existing shareholders.

Grullon & Michaely (2004) confirm previous findings of higher returns to repurchasing firms but challenge the existing intuition (which is that repurchasing firms signal better prospects in the future) by showing that operating performance does not improve following repurchase announcements. Rather, firms that announce repurchases become less risky, which justifies the long-run returns, and in a semi-strong form efficient market also the short-term abnormal announcement returns. These findings, however, cannot explain why the market reacts with a delay to the information conveyed by the announcement that repurchasing firms' risk has decreased.

Dittmar & Fields (2014) analyze a large sample of actual repurchases between 2004 and 2011 in the United States. They find that successful market timing is robustly present both at short and long horizons and consistent with managerial timing ability as inferred from insider trades. However, timing ability is entirely concentrated in a subsample of infrequent repurchasers. Firms that repurchase regularly and whose repurchases constitute the bulk of actual buybacks do not



display market timing ability. The conclusion is that motivations other than mispricing must be the driver for the majority of repurchases. Using a slightly shorter sample of US actual repurchases, Ben-Rephael, Oded & Wohl (2014) find similar evidence for timing ability particularly in certain subsets of the data, such as small firms who repurchase infrequently.

Moving on with the critical evaluation of mispricing as a motivation for repurchases, Bonaimé & Ryngaert (2013) find that insider selling is associated with the highest odds of stock repurchases by the firm, casting doubt on either managers' ability or willingness to time the market in the best interest of existing shareholders. However, this result is at least surprising, given Jenter's (2005) finding that managers time the market both in their private and corporate decisions. Using traditional data sources and comparing stock prices and valuation ratios across months during which firms repurchase compared to months during which firms do not repurchase, Bonaimé, Hankins & Jordan (2014) find that stocks are more highly priced in months during which firms actually repurchase shares. They interpret the evidence as suggesting that managers are not timing the market well.

In addition to the critical assessment of the mispricing hypothesis from actual repurchases, there is evidence from the earnings management literature that suggests that fundamental reassessment of the mispricing interpretation might be needed. The traditional papers in the mispricing literature argue that overly pessimistic market beliefs are the reason for undervaluation, and that firms react to such undervaluation by announcing and possibly conducting repurchase programs. Gong, Louis & Sun (2008) provide evidence suggesting that the converse is at least partially true as well. They hypothesize that managers systematically manage earnings announcements to achieve undervaluation of the firm's stock and then announce repurchases. The incentives for this behavior can be twofold. First, existing shareholders may be the beneficiaries, if the firm uses the temporary undervaluation to repurchase shares, as discussed above. Second, the managers might benefit personally, either through their own stock ownership or by exploiting the implications of stock mispricing for their personal options portfolios. The authors find that previous results to repurchase announcements are indeed, at least in part, due to earnings being deflated before the announcement. Supporting the second but not the first hypothesis, they also find that firms whose managers repurchase more stock and whose CEO ownership is larger are those whose earnings are most downward managed before repurchase announcements.

The evidence about whether executive options are the channel for the personal enrichment of managers is mixed. Bartov & Mohanram (2004) find that managers time announcements in ways that are compatible with increasing the cash payout of their executive options. However, Aboody et al.'s (2008) results suggest that executives do not generally condition their option exercises on private information: After exercising stock options, executives tend to hold their shares for more than 30 days following the quarter in which they exercised options, indicating that they did not exercise the options because they believed the stock to be overvalued.

Whoever the ultimate beneficiary of earnings management before repurchase announcements is, that earnings are actively deflated before repurchase announcements suggests an opportunity to rethink firms' motivations associated with buybacks. Indeed, if these results are robust, firms would not only repurchase stock because irrational market forces lead to undervaluation, but firms would also cause undervaluation so they can repurchase stock more cheaply.

In sum, there is clear *prima facie* evidence that repurchases are announced when firms are undervalued: Empirical evidence shows that the initial market response to repurchases is economically large and statistically significant. It also suggests a post-announcement drift, although this result is not uncontroversial. Also, survey evidence indicates that mispricing is a factor impacting the decision to announce repurchases. However, evidence from actual repurchases, from subsequent operating performance, and from earnings management indicates

that mispricing and market timing are not the only factors driving the majority of buybacks. In addition, it is more difficult to think of the secular increase in repurchase activity as being driven by increasing levels or an increasing frequency of equity undervaluation.

**6.1.3. Payout waves and peer effects.** The literature discussed in this subsection investigates why firms' payout decisions tend to occur at similar times, i.e., in waves. In principle, such correlations across firms in payout choices can be consistent with Miller & Modigliani's (1961) findings: For example, if macroeconomic conditions cause firms to have unusually high earnings at the same time, a correlated increase in dividend payments should be expected. To test whether Miller & Modigliani's (1961) assumptions hold or fail in this context, one must examine whether firms react similarly to the realization of a common underlying state variable that affects all firms (or a subset thereof), or whether firms mimic their peers' payout decisions for reasons unrelated to general market conditions. The distinction is subtle because the strength of peer effects unrelated to market conditions could itself vary with market conditions. The appeal, to some, of pure peer effects is that they appear to be more difficult to justify as rational behavior. Peer effects could be the result of irrational decisions by managers or by rational managers' responses to irrational market reactions (Baker, Ruback & Wurgler 2007).

The main finding of Dittmar & Dittmar (2008) is that repurchase waves overlap with financing waves. This observation challenges the notion that time-series variation in equity misvaluation drives issuance decisions. After all, if firms repurchase shares because they are undervalued, why would they simultaneously perform the reverse operation and issue shares? Moreover, to more directly challenge that misvaluation drives repurchase waves, the authors turn Jagannathan, Stephens & Weisbach's (2000) argument on its head and show that growth in repurchases tends to follow increases in stock market valuations. They conclude that macroeconomic variables drive both issuance and repurchase decisions.

Rau & Stouraitis (2011) refine Dittmar & Dittmar's (2008) results. They find that issuance and repurchase waves appear to coincide at the aggregate level because when some industries are overvalued (and thus market-timing managers find it optimal to issue shares), other industries are undervalued (which induces market-timing managers to repurchase shares). Rau & Stouraitis conclude that the observed repurchase and issuance waves happening at the same time does not necessarily mean market timing is not taking place.

In what can be interpreted as a behavioral explanation for dividend waves, Baker & Wurgler (2004) propose that time-series variation in dividend payments is due to investors' time-changing preferences for dividends. Although such preferences are typically regarded as a behavioral phenomenon, the reaction of managers to the demands of investors with time-changing sentiment may be viewed as entirely rational. Empirically, they construct several measures of the dividend premium, ranging from the difference in market-to-book ratios of dividend payers versus non-payers to the strength of the market reaction to dividend initiations. The upshot is that these measures predict dividend initiations, even after controlling for profitability, investment opportunities, and other variables. Hoberg & Prabhala (2009) provide a response that challenges the notion of time-changing preferences for dividends: Once risk controls are introduced, proxies for fads become insignificant in explaining variation in dividends.

All of the above papers suppose that an underlying state variable that affects all firms, at least within the same industry, drives corporate event waves. The following two papers, in contrast, find variation in payouts that is not driven by a common factor but by a direct effect of industry peers' payout decisions. Massa, Rehman & Vermaelen (2007) show that firms mimic repurchase announcements of industry peers. Their favored explanation is that a repurchase announcement by one firm depresses the equity values of industry peers, which the latter undo by announcing

buybacks themselves. Oded (2005) provides a signaling model in which announcing a buyback is indeed the optimal response for “good” firm types to others’ buyback announcements. As Massa, Rehman & Vermaelen are careful to point out, the existence of such peer effects does not conflict with the idea that aggregate variables drive waves, because the nature of the strategic interaction between firms likely varies over the business cycle. Popadak (2013) uses a variety of identification strategies to try to distinguish peer effects in dividend changes from correlated dividend payments due to factors affecting the peer group as a whole and finds support for the peer influence hypothesis. Unlike Massa, Rehman & Vermaelen, Popadak concludes that behavioral factors are a key driver of her findings.

In sum, the literature on payout waves has accumulated evidence for a direct influence of macroeconomic conditions on payout decisions, as well as for peer effects that come on top of variation explained by common factors. The strength of the peer effects is acknowledged to possibly depend on macroeconomic conditions themselves, making the distinction rather subtle. As is true in other fields, behavioral explanations are quickly complemented by a rational contender. An open empirical question is whether fads for repurchases exist, or whether periods with a low taste for dividends simply lead to more corporate savings.

**6.1.4. Conclusions on the interaction between payouts and the market for the underlying stock.** The literature on the interaction between payouts and the liquidity and pricing of the underlying stock reviewed in Section 6.1 focused on ideas that have power in explaining cross-sectional variation and cyclicity of payouts. The overall evidence seems to suggest that although mispricing is a motivation in firms’ decisions to repurchase, it is not the main motivation. Mispricing by itself is also less suited to explain secular trends in payout choices. The next two sections discuss literatures that investigate why firms would repurchase stock even when the stock is not undervalued, as well as whether such repurchases come in place of or on top of dividend payments.

## **6.2. Management Compensation and Incentives, and the Payout Choice**

This strand of literature investigates the extent to which variation across firms in how managers are incentivized explains cross-sectional variation in payout policies. By establishing such a link in the cross section, this literature also raises the possibility that trends in compensation could drive time-series trends in payout policy.

Managers’ incentives to favor one form of payout over another could be motivated by an explicit aspect of their compensation contracts or be implied through the incentives of their personal stock and options holdings in combination with personal income taxes. Cheng, Harford & Zhang (2010) investigate the explicit route. They analyze 12,476 Form DEF 14A proxy statements filed with the SEC and extract information on whether EPS is an explicit component of the manager’s bonus, and on the threshold level of EPS that triggers bonus payments. They find that companies buy back more shares when management bonuses are linked to EPS, which can be increased in the short term by buying back shares. This relationship is particularly strong if the company would otherwise fall short of an EPS threshold. Young & Yang (2011) provide similar results for the United Kingdom. They hand-collect information on executive contracts from annual reports and financial statements and find more repurchases by firms with EPS performance conditions in executive compensation contracts than by firms without such conditions. These results support the notion that explicit management incentives matter for payout decisions.

Investigating a more indirect route, Hsieh & Wang (2008) find that firms are more likely to repurchase shares rather than pay dividends if insiders hold a greater share of the stock. This

relationship is stronger in their sample period (1991–2001)—years in which dividends were more tax disadvantaged. They conclude that insiders' tax considerations affect corporate payout decisions. It is important to note that these results hold for a sample limited to firms with positive payouts.

Using a sample ranging from 1993–2003, Brown, Liang & Weisbenner (2007) do not find any relation between insider ownership and a preference to pay dividends. They do find, however, that firms whose executives have higher ownership were more likely to increase dividends in response to the 2003 dividend tax cut, consistent with the notion that managerial incentives matter for payout choices.

However, even a seemingly exogenous tax change does not necessarily allow for a causal interpretation with respect to the direction from taxes to payout choices. Aboody & Kasznik (2008), discussed by Shevlin (2008), investigate the opposite causality of the previous hypotheses. They find that compensation contracts change as a result of the 2003 dividend tax cut. Babenko (2009) similarly investigates the causal relationship between payouts and incentives. She finds that repurchases increase pay-performance sensitivity and increase employee effort. These studies suggest that firms' responses to the tax shock may be affected by changes in compensation contracts. To the extent that the researchers' interest is only in investigating the reduced-form effect of a tax cut on payout choices, this distinction may be regarded as inconsequential. If, however, the precise mechanism is of interest, the effect of tax changes on contracts would constitute omitted variables in the empirical design of papers taking the tax shock as exogenous. Those studies would then overstate the importance of variation in taxes to explain variation in payout policy.

The above papers investigate how management bonuses and stock ownership affect firms' payout choices. Option compensation of executives is another potential channel. As noted by Lambert, Larcker & Larcker (1989), dividend payments reduce the value of executive options because dividends reduce the per-share value of the firm.<sup>14</sup> As a result, all else equal, dividends should be less likely to be paid by firms whose executives hold more options. Repurchases, unlike dividends, do not generally dilute the per-share value of the stock. As a result, managers who hold (unprotected) stock options have an incentive to substitute repurchases for dividends. Indeed, Jolls (1998) and Fenn & Liang (2001) find that firms pay less dividends and are more likely to repurchase stock when management is compensated more with stock options. Dittmar (2000) also finds that option compensation of executives is related to the propensity to repurchase stock. Cuny, Martin & Puthenpurackal (2009) confirm this result using more recent data. As Fenn & Liang (2001) point out, these cross-sectional results suggest that the recent growth in stock option compensation may help explain the rise in repurchases at the expense of dividends.

The above literature investigates the effect of executive compensation on payout choices. In evaluating these results, we should take into consideration that as option compensation for executives became more popular, so did stock option plans for employees. One might also expect a correlation between executive and employee stock option plans in the cross section. As a result, correlations between payout choices and executive compensation might overstate the causal effect of executive options on payout choices when employee option plans are an omitted variable.

---

<sup>14</sup>Only 1% of executive options are explicitly dividend protected (Murphy 1999); Kahle (2002) explains that a more favorable accounting treatment of unprotected options is a reason for firms to not offer dividend-protected options. That said, it would be interesting to investigate to what extent executive options are implicitly dividend protected, for example by potential repricing of options in response to large dividend changes.

The next section discusses papers investigating the possibility that nonexecutive employee compensation, in particular employee option compensation and employee stock purchase plans, is indeed a major driver of repurchases.

### 6.3. Earnings per Share Dilution, Employee Stock Options, and Employee Stock Purchase Plans

Papers reviewed in the previous section conclude that executive option compensation leads to more repurchases, because option compensation creates an incentive not to pay dividends. This section examines whether nonexecutive employee option compensation creates an additional incentive to repurchase. The key idea is that managers may attempt to undo the dilution created by the issuance of shares as a result of the exercise of stock options, and, in particular, the negative effect that this dilution can have on EPS. Managers' incentives to do so can come from explicit EPS targets included in their compensation contracts, or from market pressure. For example, in 2000, Microsoft cited pressure by analysts to undo dilution caused by the exercise of employee stock options as a reason for its stock repurchase program (Clark & Buckman 2000). Consistent with this example, surveys of top executives indicate that dilution is a major motivation for repurchases more generally (Brav et al. 2005).

A fast-growing literature provides evidence that managers' concerns about meeting EPS targets are indeed the motivation for a significant portion of repurchases. If that motivation is strong enough, companies may repurchase shares even when they are overpriced, thus offering a solution to the puzzle posed by some studies on managerial timing ability. In fact, firms may be even more likely to repurchase stock when the price is high: When the stock price is high, more options are in the money and employees are more likely to exercise them (Huddart & Lang 1996; Heath, Huddart & Lang 1999). If firms undo the dilution in a timely manner, (some) repurchase activity might have a procyclical component, as observed in the data.

This literature starts with correlations and then advances to more cleanly identified evidence. Dunsby (1993) documents a correlation between the existence of an employee stock option plan and a firm's propensity to repurchase its own stock. Using proxies available at that time, Weisbenner (2000) and Dittmar (2000) provide evidence that some repurchases are likely performed to offset increases in the number of shares caused by option exercises. Later papers use more direct measures of the number of shares issued to employees to investigate the extent to which repurchases are driven by such anti-dilution efforts. Kahle (2002) uses hand-collected data on employee stock options to show that firms whose managers own more options and whose employees have more options currently exercisable are more likely to announce repurchases. Firms that are more likely to have experienced option exercises in the past year also buy back more shares. Although the decision to repurchase depends on the number of executive options outstanding, the size of the buyback does not. Instead, the size depends on total options exercisable. Kahle (2002) therefore attributes the increased importance of repurchase activity over time both to management's incentives to not pay option value—destroying dividends and to their attempts to undo the dilution caused by the exercise of stock options. This distinction sets her study apart from the previously discussed papers by Jolls (1998) and by Fenn & Liang (2001), which did not distinguish between the dilution motivation and the motivation to preserve the value of executive options. The next set of papers examines what motivates managers' efforts to avoid dilution.

Bens et al. (2003) show that repurchase activity is affected by a desire to maintain (diluted) EPS above target levels such as analysts' forecasts. The incentive to avoid dilution is so strong that real investment projects get crowded out as a result of funds being diverted to repurchases

(Bens, Nagar & Wong 2002).<sup>15</sup> Hribar, Jenkins & Johnson (2006) extend the previous results by focusing on EPS management generally, whether or not the underlying reason is the exercise of stock options.<sup>16</sup> They find a discontinuous increase in the probability of share repurchases around zero earnings surprises. This motivates Almeida, Fos & Kronlund (2013) to exploit a regression discontinuity framework to show that repurchases conducted to counter dilution have a negative effect on firm investment and employment.

In sum, there is growing evidence that concerns about EPS dilution, regardless of the exact cause of the dilution, might be an important motivation for repurchases. This is an exciting finding, particularly to the extent that this motivation might be able to contribute to an explanation for cross-sectional variation, cyclical variation, and secular trends in payout policy. As promising as the extant evidence is, there remain several open questions: What fraction of repurchases is motivated by a desire to avoid dilution? Can the time-series increase in repurchases at the expense of dividends be explained quantitatively by these anti-dilution efforts? To what extent do these efforts depend on managerial incentives (explicit or implicit) to meet EPS targets, or on managers being compensated with options? Also, more research is needed to fully understand the costs that firms are willing to incur to avoid dilution. These questions should be fruitful avenues for future research.

#### 6.4. Accelerated Share Repurchases

In recent years, a particular mechanism of conducting stock buybacks, ASRs, has gained momentum. In 2003, ASRs comprised but a nominal percentage of total repurchase transactions. In 2007, the number of ASR transactions already accounted for 25% of all repurchases. (Traditional OMRs are still the leading mechanism.)

ASRs differ from OMRs in that an investment bank serves as an intermediary. Specifically, the investment bank borrows shares from existing investors, makes them available immediately to the repurchasing firm, and covers its short position in the following months. The firm immediately reduces the number of shares outstanding by the respective amount and, importantly, also immediately accounts for the thus-enhanced EPS. A typical ASR agreement includes a forward contract and specified caps and floors on the settlement amount, thus reducing the risk to the firm with respect to changes in its stock price in the time between the ASR agreement and its settlement.

ASR announcements are commitments by the firm to actually repurchase a set amount of shares in the immediate future. The firm thus gives up the option value to repurchase only if it is optimal to do so given future market conditions (Ikenberry & Vermaelen 1996). Therefore, although it is possible that firms exploit current misvaluation by initiating an ASR agreement, securing an option to exploit future misvaluation cannot be a motivation for ASRs compared to OMRs. In a sample of 256 ASRs during 1996–2008, Barger, Kulchania & Thomas (2011) find that the median ASR agreement price is identical to the previous closing price. They also report that the propensity to undertake ASRs is negatively related to the stock price volatility and illiquidity, proxies for the value of the flexibility option.

---

<sup>15</sup>Notice that more funds are required to repurchase a share at current market value than the firm receives for the exercise of (in-the-money) stock options.

<sup>16</sup>These extensions follow Guay (2002) and Larcker's (2003) suggestions. Also, option exercises generate an additional cash inflow to the firm (as long as the strike price of the option is nonzero). This cash may need to be disbursed, thus motivating repurchases. Babenko, Lemmon & Tserlukevich (2011) and McKeon (2013) show that cash inflows from stock issuance to employees are indeed large. Lastly, in Japan, a majority of options issues are connected with a stock repurchase because it is the simplest way for firms to provide the stock to employees (Kato et al. 2005).



In light of this evidence, one may argue that ASRs are costly relative to OMRs because they eliminate the option to exploit future mispricing. (This assumes that firms are able to time the market with their repurchases, a view challenged by the evidence in Dittmar & Fields 2014 and Bonaimé, Hankins & Jordan 2014.) However, there are several potential benefits of using ASRs as a repurchase vehicle. First, investment banks have more experience and enjoy scale effects regarding the optimal execution of repurchases. This benefit should be particularly important for firms engaging in large repurchases. Second, under ASRs, increases in EPS as a result of future repurchases get recorded immediately. This feature should be particularly attractive to firms run by managers with incentives to meet EPS targets. (An additional accounting benefit, noted by Dickinson, Kimmel & Warfield 2012, is that losses from the forward position bypass the income statement and are reported as adjustments of equity upon settlement.) Third, the immediate reduction of outstanding shares may be particularly beneficial in fighting off hostile takeover bids (Heron & Lie 2006, Billett & Xue 2007, Cheng & Zhang 2012). Fourth, ASRs can enhance the strength of the signal of undervaluation because they constitute a commitment to execute the announced repurchase. This motivation should be particularly important for firms suffering from a lack of credibility with regard to actually conducting announced OMRs.

These potential benefits of ASRs (or variations thereof) are the main hypotheses explored by the papers recently written on the subject. Collecting data on ASRs typically involves a news search or a search of SEC filings for mentions of ASRs. Different search criteria lead to different samples and different conclusions, as is evidenced by the existing literature. Cook & Kim (2006) are among the first to study ASRs and document that larger firms are more likely to use ASRs as a vehicle to buy back stock; Barger, Kulchania & Thomas (2011) find the same. To the extent that larger firms are also firms that conduct larger repurchases, this evidence is consistent with the first benefit. Notably, however, Barger, Kulchania & Thomas report that the average ASR deal size corresponds to 5.3% of outstanding equity, compared to 6.8% for non-ASR repurchases as reported by Grullon & Michaely (2004) for the period 1980–1997. As ASRs are usually only a portion of a repurchase program (58% on average in Barger, Kulchania & Thomas' sample), it is likely that the average repurchase program that includes an ASR is also larger as a share of outstanding equity than a typical OMR.

Marquardt, Tan & Young (2007) and Barger, Kulchania & Thomas (2011) document that ASRs are used more frequently when executive bonuses are tied to EPS and other incentives of the manager to increase EPS quickly, evidence for the second benefit. Chemmanur, Cheng & Zhang (2010) show that repurchases conducted through ASRs are typically larger than OMR programs and also find a correlation with management bonuses tied to EPS. Moreover, they find that ASR firms tend to have lower cash, high leverage, and low valuations—characteristics making them particularly prone to being takeover targets, speaking to the third benefit. Barger, Kulchania & Thomas also find that ASR firms have lower cash-to-asset ratios and also slightly lower free cash flow; however, these firms also have lower cash flow volatility, which possibly explains the lower cash holdings. Using a sample of 135 ASRs between 2004 and 2008, Akyol, Kim & Shekhar (2014) also find evidence suggesting that ASRs are used by firms with a higher likelihood of being the target of takeover bids. As these firms are also shown to have more entrenched management, it is intriguing that the authors also find positive ASR-announcement returns and post-announcement drift, whereas operating performance does not improve following ASR announcements. Moreover, the incidence of takeover bids and rumors of takeover bids do not decrease post-ASR. The authors conclude that ASRs are not an effective tool to fend off takeovers. Bonaimé (2012) finds that firms with low past repurchase completion rates are more likely to use



ASRs. As OMR completion rates are positively correlated with announcement returns, she interprets the evidence as consistent with the fourth benefit.

The literature has not settled on the importance of the signaling value, or more generally, the information content, of ASRs relative to conventional OMRs. Chemmanur, Cheng & Zhang (2010) find larger positive announcement effects and better post-announcement operating and stock performance for ASRs compared to OMR announcements. In contrast, Michel, Oded & Shaked (2010) find that, although ASR announcement returns are positive, they are smaller than those of OMRs and that the post-announcement performance of ASR stocks is poor. The difference in results seems to be driven by subtle variations in the way the papers search for announcements and eliminate duplicate observations, which, in turn, results in substantial variations in sample size and composition. Methodological differences further complicate the interpretation of results on misvaluation as a motivation for ASRs. Barger, Kulchania & Thomas (2011) find that the pre-announcement stock performance of ASR firms is better than that of firms repurchasing without ASRs, casting doubt on the undervaluation and signaling hypotheses.<sup>17</sup> The same paper, however, documents that firms with valuations below the average market-to-book ratio for the sector are more likely to conduct ASRs, suggesting that more undervalued firms are more likely to conduct ASRs.

Similarly, the matter regarding the market impact of ASRs has not been settled. Chemmanur, Cheng & Zhang (2010) and Kulchania (2012) find a positive effect on liquidity, whereas Barger, Kulchania & Thomas (2011) find that firms with greater stock market liquidity are more likely to conduct ASRs, suggesting that liquidity improvements are a lesser motivation for ASRs compared to OMRs. It is likely that the literature will settle on more definitive answers regarding the signal value and market impact of ASRs only once larger and more standardized datasets can be assembled.

## 7. CONCLUSIONS

The academic literature on payout policy has made significant advancements in the past 20 years. First, we know much more about the importance of taxes, agency, and signaling motivation for payout policy. In particular, the 2003 dividend tax cut prompted several interesting studies on the effects of taxes on payouts. On the whole, studies centered on the 2003 dividend tax cut confirm that differences in the taxation of dividends and capital gains have only a second-order impact on payout policy. Signaling theories have found only weak support, both empirically and in survey evidence, which likely explains why the notion of dividends as costly signals of firm quality to the market has become less popular. Agency has often prevailed as the alternative explanation in the horse race against signaling theories. However, the predictions of agency theories are often not precise and detailed enough to guide empirical research, and some important questions such as whether strong governance and payouts are complements or substitutes remain unresolved. Most importantly, however, none of the three classical explanations has had much to say about the secular trend of repurchases substituting for dividends, nor about the cyclicity of repurchases.

Indeed, perhaps the most important change in corporate payout policy in the past two decades is the secular increase of stock repurchases and the triumph of buybacks over dividends as the dominant form of corporate payouts. Because this trend is unlikely to be explained by changes in

---

<sup>17</sup>The argument follows Jagannathan, Stephens & Weisbach's (2000) logic in the context of OMRs. They view negative abnormal preannouncement returns as a sign of undervaluation—of course with a less recent sample.

differential taxation, or by changes in contracting possibilities or asymmetric information, researchers have searched for alternative explanations.

Most recent studies have focused on new mechanisms that have the potential to explain the secular and business cycle time-series variation of payouts. At the forefront are explanations that investigate the interaction between payouts and compensation of both executives and rank-and-file employees. The power of these explanations to explain the secular increase and cyclicity of repurchases is based on the combination of the following four facts: (a) Share repurchases can offset the dilution caused by the exercise of employee options; (b) executive incentives are often based (explicitly or implicitly) on EPS, which is a measure that is, all else equal, negatively impacted by dilution;<sup>18</sup> (c) the popularity of stock options has increased markedly over the past few decades; and (d) stock option exercises tend to be procyclical. Research opportunities in this area abound.

Moving away from mechanisms and looking at the bigger picture, we observe that, until recently, most of the academic literature has analyzed payout policy in isolation. An important development in the payout literature over the past decade has been to consider the interaction between payout and other corporate policies, such as compensation. A key insight from this development is that several factors other than the level of free cash flow determine the level and form of payouts. That payouts are not simply residual cash flows underlines the importance of taking seriously the interdependence of financing, investment, and payout decisions.

This insight suggests that one promising area of future research is to further analyze the interaction of payouts with other corporate financing decisions. For instance, if option exercises are a dominant driver of repurchasing decisions, free cash flow may no longer be the sole source of capital for payouts. Although others, including Allen & Michaely (2003) and DeAngelo, DeAngelo & Skinner (2008), have pointed out before the need to fill the gap between the financing and payout literatures, little work has been done to that end.

In addition to analyzing the interaction between a firm's financing and payout policies, investigating how firms' investment and payout choices are related seems critical. Surveying financial executives, Brav et al. (2005) find that most managers would forego some positive NPV projects before cutting dividends. In recent work, Almeida, Fos & Kronlund (2013) find evidence consistent with the notion that public-firm managers are willing to trade off investments and employment for stock repurchases that allow them to meet analyst EPS forecasts. Although this evidence is certainly thought-provoking, we still know very little about the magnitude and importance of these effects.

In conclusion, much more research is needed to understand even the basic elements of the corporate financial "eco-system," which includes financing, investment, and payout policies. We believe that analyzing these interactions can play a key role in advancing the payout literature in the years to come.

## DISCLOSURE STATEMENT

The authors are not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

---

<sup>18</sup>That said, not all repurchases have a positive effect on EPS: The effect of repurchases on EPS depends mechanically on the relation between the firm's price-earnings ratio and the opportunity cost of the cash used to undertake repurchases (Bens et al. 2003).

## ACKNOWLEDGMENTS

We thank Alice Bonaimé, Harry DeAngelo, Jerry Hoberg, Kathy Kahle, Jacob Oded, Theo Vermaelen, and an anonymous referee for helpful comments. We thank Alexandra Tebay for excellent assistance in editing the manuscript.

## LITERATURE CITED

- Aboody D, Hughes J, Liu J, Su W. 2008. Are executive stock option exercises driven by private information? *Rev. Account. Stud.* 13:551–70
- Aboody D, Kasznik R. 2008. Executive stock-based compensation and firms' cash payout: the role of shareholders' tax-related payout preferences. *Rev. Account. Stud.* 13:216–51
- Acharya V, Lambrecht BM. 2014. *A theory of income smoothing when insiders know more than outsiders*. Work. Pap. 401/2014, Eur. Corp. Gov. Inst. Finance
- Aharony J, Swary I. 1980. Quarterly dividend and earnings announcements and stockholders' returns: an empirical analysis. *J. Finance* 35:1–12
- Aivazian VA, Booth L, Cleary S. 2006. Dividend smoothing and debt ratings. *J. Financ. Quant. Anal.* 41:439–53
- Akerlof GA. 1970. The market for 'lemons': quality uncertainty and the market mechanism. *Q. J. Econ.* 84:488–500
- Akyol AC, Kim JS, Shekhar C. 2014. The causes and consequences of accelerated stock repurchases. *Int. Rev. Finance* 14:319–43
- Allen F, Bernardo AE, Welch I. 2000. A theory of dividends based on tax clienteles. *J. Finance* 55:2499–536
- Allen F, Michaely R. 2003. Payout policy. In *Handbook of the Economics of Finance*, Vol. 1A: *Corporate Finance*, ed. GM Constantinides, M Harris, R Stulz, pp. 337–429. Amsterdam: Elsevier
- Almeida H, Campello M, Weisbach MS. 2004. The cash flow sensitivity of cash. *J. Finance* 59:1777–804
- Almeida H, Fos V, Kronlund M. 2013. *The real effects of share repurchases*. Work. Pap., Univ. Ill., Urbana-Champaign
- Amihud Y, Li K. 2006. The declining information content of dividend announcements and the effects of institutional holdings. *J. Financ. Quant. Anal.* 41:637–60
- Amihud Y, Murgia M. 1997. Dividends, taxes, and signaling: evidence from Germany. *J. Finance* 52:397–408
- Babenko I. 2009. Share repurchases and pay-performance sensitivity of employee compensation contracts. *J. Finance* 64:117–50
- Babenko I, Lemmon M, Tserlukevich Y. 2011. Employee stock options and investment. *J. Finance* 66:981–1009
- Babenko I, Tserlukevich Y, Vedrashko A. 2012. The credibility of open market share repurchase signaling. *J. Financ. Quant. Anal.* 47:1059–88
- Baker M, Ruback RS, Wurgler J. 2007. Behavioral corporate finance: a survey. In *Handbooks in Finance*, Vol. 1: *Handbook of Empirical Corporate Finance*, ed. BE Eckbo, pp. 145–68. Amsterdam: North-Holland
- Baker M, Wurgler J. 2004. A catering theory of dividends. *J. Finance* 59:1125–65
- Bali R, Hite GL. 1998. Ex dividend day stock price behavior: discreteness or tax-induced clienteles? *J. Financ. Econ.* 47:127–59
- Barclay MJ. 1987. Dividends, taxes, and common stock prices: the ex-dividend day behavior of common stock prices before the income tax. *J. Financ. Econ.* 19:31–44
- Barclay MJ, Smith CW Jr. 1988. Corporate payout policy: cash dividends versus open-market repurchases. *J. Financ. Econ.* 22:61–82
- Bargeron L, Bonaime A, Thomas S. 2014. *The life-cycle of open market repurchase programs*. Work. Pap., Gatton Coll. Bus. Finance, Univ. Ky./Finance Group, Univ. Pittsb. g.
- Bargeron L, Kulchania M, Thomas S. 2011. Accelerated share repurchases. *J. Financ. Econ.* 101:69–89
- Bartov E, Mohanram P. 2004. Private information, earnings manipulations, and executive stock-option exercises. *Account. Rev.* 79:889–920

- Benartzi S, Michaely R, Thaler RH. 1997. Do changes in dividends signal the future or the past? *J. Finance* 52:1007–34
- Benoit D. 2013. Icahn raises Apple stake, urges \$150 billion buyback: ‘There is nothing short term about my intentions,’ activist investor tells Tim Cook in letter. *The Wall Street Journal*, Oct. 15
- Ben-Rephael A, Oded J, Wohl A. 2014. Do firms buy their stock at bargain prices? Evidence from actual stock repurchase disclosures. *Rev. Finance* 18:1299–1340
- Bens DA, Nagar V, Skinner DJ, Wong MHF. 2003. Employee stock options, EPS dilution, and stock repurchases. *J. Account. Econ.* 36:51–90
- Bens DA, Nagar V, Wong MHF. 2002. Real investment implications of employee stock option exercises. *J. Account. Res.* 40:359–93
- Bernhardt D, Douglas A, Robertson F. 2005. Testing dividend signaling models. *J. Empir. Finance* 12:77–98
- Bernheim BD, Wantz A. 1995. A tax-based test of the dividend signaling hypothesis. *Am. Econ. Rev.* 85:532–51
- Bates TW, Kahle KM, Stulz RM. 2009. Why do U.S. firms hold so much more cash than they used to? *J. Finance* 64:1985–2021
- Bhattacharya S. 1979. Imperfect information, dividend policy, and ‘the bird in the hand’ fallacy. *Bell J. Econ.* 10:259–70
- Billett MT, Xue H. 2007. The takeover deterrent effect of open market share repurchases. *J. Finance* 62:1827–50
- Black F, Scholes M. 1974. The effects of dividend yield and dividend policy on common stock prices and returns. *J. Financ. Econ.* 1:1–22
- Blouin JL, Raedy JS, Shackelford DA. 2004. *The initial impact of the 2003 reduction in the dividend tax rate*. Work. Pap., Univ. N. C.
- Bolton P, Scharfstein DS. 1990. A theory of predation based on agency problems in financial contracting. *Am. Econ. Rev.* 80:93–106
- Bonaimé AA. 2012. Repurchases, reputation, and returns. *J. Financ. Quant. Anal.* 47:469–91
- Bonaimé AA, Hankins KW, Harford J. 2014. Financial flexibility, risk management, and payout choice. *Rev. Financ. Stud.* 27:1074–1101
- Bonaimé AA, Hankins KW, Jordan BD. 2014. *Wiser to wait: Do firms optimally execute share repurchases?* Work. Pap., Univ. Ky.
- Bonaimé AA, Ryngaert MD. 2013. Insider trading and share repurchases: Do insiders and firms trade in the same direction? *J. Corp. Finance* 22:35–53
- Boudoukh J, Michaely R, Richardson M, Roberts MR. 2007. On the importance of measuring payout yield: implications for empirical asset pricing. *J. Finance* 62:877–915
- Brav A, Graham JR, Harvey CR, Michaely R. 2005. Payout policy in the 21st century. *J. Financ. Econ.* 77:483–527
- Brav A, Graham JR, Harvey CR, Michaely R. 2008a. Managerial response to the May 2003 dividend tax cut. *Financ. Manag.* 37:611–24
- Brav A, Graham JR, Harvey CR, Michaely R. 2008b. The effect of the May 2003 dividend tax cut on corporate dividend policy: empirical and survey evidence. *Natl. Tax J.* 61:381–96
- Brennan MJ. 1970. Taxes, market valuation and corporate financial policy. *Natl. Tax J.* 23:417–27
- Brickley JA. 1983. Shareholder wealth, information signaling and the specially designated dividend: an empirical study. *J. Financ. Econ.* 12:187–209
- Brockman P, Chung DY. 2001. Managerial timing and corporate liquidity: evidence from actual share repurchases. *J. Financ. Econ.* 61:417–48
- Brown JR, Liang N, Weisbenner S. 2007. Executive financial incentives and payout policy: firm responses to the 2003 dividend tax cut. *J. Finance* 62:1935–65
- Campbell J, Shiller R. 1988. The dividend-price ratio and expectations of future dividends and discount factors. *Rev. Financ. Stud.* 1:195–228
- Chan K, Ikenberry D, Lee I. 2004. Economic sources of gain in stock repurchases. *J. Financ. Quant. Anal.* 39:461–79
- Charest G. 1978. Dividend information, stock returns and market efficiency-II. *J. Financ. Econ.* 6:297–330

- Chemmanur T, Cheng Y, Zhang T. 2010. *Why do firms undertake accelerated share repurchase programs?* Work. Pap., Boston Coll.
- Chen NF, Grundy B, Stambaugh RF. 1990. Changing risk, changing risk premiums, and dividend yield effects. *J. Bus.* 63:S51–70
- Cheng Y, Harford J, Zhang T. 2010. *Bonus-driven repurchases.* Work. Pap., Fla. State Univ.
- Cheng Y, Zhang T. 2012. *Does share buyback deter takeovers? From ex ante to ex post.* Work. Pap., Fla. State Univ.
- Chetty R, Saez E. 2005. Dividend taxes and corporate behavior: evidence from the 2003 dividend tax cut. *Q. J. Econ.* 120:791–833
- Chetty R, Saez E. 2006. The effects of the 2003 dividend tax cut on corporate behavior: interpreting the evidence. *Am. Econ. Rev.* 96:124–29
- Chhaochharia V, Grinstein Y, Grullon G, Michaely R. 2014. *Product market competition and internal governance: evidence from the Sarbanes Oxley Act.* Work. Pap., Cornell Univ.
- Clark D, Buckman R. 2000. Microsoft to resume buybacks to provide for employee options, prevent dilution. *The Wall Street Journal*, Aug. 8, p. B6
- Cochrane JH. 1991. Production-based asset pricing and the link between stock returns and economic fluctuations. *J. Finance* 46:209–37
- Cochrane JH. 2011. Presidential address: discount rates. *J. Finance* 66:1047–108
- Cook DO, Kim JS. 2006. *Derivatives in share repurchase programs.* Work. Pap., Univ. Ala.
- Cook DO, Krigman L, Leach JC. 2004. On the timing and execution of open market repurchases. *Rev. Financ. Stud.* 17:463–98
- Crane AD, Michenaud S, Weston J. 2014. *The effect of institutional ownership on payout policy: a regression discontinuity design approach.* Work. Pap., Rice Univ.
- Cuny CJ, Martin GS, Puthenpurackal JJ. 2009. Stock options and total payout. *J. Financ. Quant. Anal.* 44:391–410
- Dann LY. 1981. Common stock repurchases: an analysis of returns to bondholders and stockholders. *J. Financ. Econ.* 9:113–38
- DeAngelo H, DeAngelo L, Skinner DJ. 1992. Dividends and losses. *J. Finance* 47:1837–63
- DeAngelo H, DeAngelo L, Skinner DJ. 1996. Reversal of fortune: dividend signaling and the disappearance of sustained earnings growth. *J. Financ. Econ.* 40:341–71
- DeAngelo H, DeAngelo L, Skinner DJ. 2004. Are dividends disappearing? Dividend concentration and the consolidation of earnings. *J. Financ. Econ.* 72:425–56
- DeAngelo H, DeAngelo L, Skinner DJ. 2008. Corporate payout policy. *Found. Trends Finance* 3:95–287
- DeAngelo H, DeAngelo L, Stulz RM. 2006. Dividend policy and the earned/contributed capital mix: a test of the life-cycle theory. *J. Financ. Econ.* 81:227–54
- Del Guercio D. 1996. The distorting effect of the prudent-man laws on institutional equity investments. *J. Financ. Econ.* 40:31–62
- de Jong A, Dutordoir M, Verwijmeren P. 2011. Why do convertible issuers simultaneously repurchase stock? An arbitrage-based explanation. *J. Financ. Econ.* 100:113–29
- DeMarzo PM, Sannikov Y. 2014. *Learning, termination, and payout policy in dynamic incentive contracts.* Work. Pap., Stanford/Princeton.
- Denis DJ, Osobov I. 2008. Why do firms pay dividends? International evidence on the determinants of dividend policy. *J. Financ. Econ.* 89:62–82
- Desai MA, Jin L. 2011. Institutional tax clienteles and payout policy. *J. Financ. Econ.* 100:68–84
- Dewenter KL, Warther VA. 1998. Dividends, asymmetric information, and agency conflicts: evidence from a comparison of the dividend policies of Japanese and U.S. firms. *J. Finance* 53:879–904
- Dickinson V, Kimmel P, Warfield T. 2012. The accounting and market consequences of accelerated share repurchases. *Rev. Account. Stud.* 17:41–71
- Dittmar AK. 2000. Why do firms repurchase stock? *J. Bus.* 73:331–55
- Dittmar AK, Dittmar RF. 2008. The timing of financing decisions: an examination of the correlation in financing waves. *J. Financ. Econ.* 90:59–83

- Dittmar AK, Fields LC. 2014. Can managers time the market? Evidence using repurchase price data. *J. Finance Econ.* Forthcoming
- D'Mello R, Shroff PK. 2000. Equity undervaluation and decisions related to repurchase tender offers: an empirical investigation. *J. Finance* 55:2399–424
- Dunsby A. 1993. *Share repurchases and corporate distributions: an empirical study*. Work. Pap., Univ. Pa.
- Easterbrook FH. 1984. Two agency-cost explanations of dividends. *Am. Econ. Rev.* 74:650–59
- Eaton GW, Paye BS. 2014. *Predictable variation in stock returns and cash flow growth: What role does issuance play?* Work. Pap., Univ. Ga.
- Elton EJ, Gruber MJ. 1970. Marginal stockholder tax rates and the clientele effect. *Rev. Econ. Stat.* 52:68–74
- Fama EF. 1998. Market efficiency, long-term returns, and behavioral finance. *J. Financ. Econ.* 49:283–306
- Fama EF, French KR. 1993. Common risk factors in the returns on stock and bonds. *J. Financ. Econ.* 33:3–56
- Fama EF, French KR. 2001. Disappearing dividends: changing firm characteristics or lower propensity to pay? *J. Financ. Econ.* 60:3–43
- Farre-Mensa J, Michaely R, Schmalz M. 2014. *How are payouts funded?* Work. Pap., Harvard Univ.
- Fenn GW, Liang N. 2001. Corporate payout policy and managerial stock incentives. *J. Financ. Econ.* 60:45–72
- Ferris SP, Sen N, Yui HP. 2006. God save the queen and her dividends: corporate payouts in the United Kingdom. *J. Bus.* 79:1149–73
- Fos V, Kim B, Kronlund M. 2014. *The dark side of insider ownership*. Work. Pap., Univ. Ill., Urbana-Champaign
- Frank M, Jagannathan R. 1998. Why do stock prices drop by less than the value of the dividend? Evidence from a country without taxes. *J. Financ. Econ.* 47:161–88
- Fudenberg D, Tirole J. 1995. A theory of income and dividend smoothing based on incumbency rents. *J. Polit. Econ.* 103:75–93
- Ginglinger E, Hamon J. 2007. Actual share repurchases, timing and liquidity. *J. Bank. Finance* 31:915–38
- Giroud X, Mueller HM. 2010. Does corporate governance matter in competitive industries? *J. Financ. Econ.* 95:312–31
- Goergen M, Renneboog L, Correia da Silva L. 2005. When do German firms change their dividends? *J. Corp. Finance* 11:375–99
- Gompers P, Ishii J, Metrick A. 2003. Corporate governance and equity prices. *Q. J. Econ.* 118:107–55
- Gonedes NJ. 1978. Corporate signaling, external accounting, and capital market equilibrium: evidence on dividends, income, and extraordinary items. *J. Account. Res.* 16:26–79
- Gong G, Louis H, Sun AX. 2008. Earnings management and firm performance following open-market repurchases. *J. Finance* 63:947–86
- Graham JR, Kumar A. 2006. Do dividend clienteles exist? Evidence on dividend preferences of retail investors. *J. Finance* 61:1305–36
- Graham JR, Michaely R, Roberts MR. 2003. Do price discreteness and transactions costs affect stock returns? Comparing ex-dividend pricing before and after decimalization. *J. Finance* 58:2611–35
- Green RC, Rydqvist K. 1999. Ex-day behavior with dividend preference and limitations to short-term arbitrage: the case of Swedish lottery bonds. *J. Financ. Econ.* 53:145–87
- Grinstein Y, Michaely R. 2005. Institutional holdings and payout policy. *J. Finance* 60:1389–426
- Grossman SJ, Hart OD. 1980. Takeover bids, the free-rider problem, and the theory of the corporation. *Bell J. Econ.* 11:42–54
- Grullon G, Michaely R. 2002. Dividends, share repurchases, and the substitution hypothesis. *J. Finance* 57:1649–84
- Grullon G, Michaely R. 2004. The information content of share repurchase programs. *J. Finance* 59:651–80
- Grullon G, Michaely R. 2012. *Payout policy and product market competition*. Work. Pap., Cornell Univ.
- Grullon G, Michaely R, Swaminathan B. 2002. Are dividend changes a sign of firm maturity? *J. Bus.* 75:387–424
- Grullon G, Paye B, Underwood S, Weston JP. 2011. Has the propensity to pay out declined? *J. Financ. Quant. Anal.* 46:1–24
- Guay W. 2002. Discussion of real investment implications of employee stock option exercises. *J. Account. Res.* 40:395–406



- Guay W, Harford J. 2000. The cash-flow permanence and information content of dividend increases versus repurchases. *J. Financ. Econ.* 57:385–415
- Guttman I, Kadan O, Kandel E. 2010. Dividend stickiness and strategic pooling. *Rev. Financ. Stud.* 23:4455–95
- Hackethal A, Zdantchouk A. 2006. Signaling power of open market share repurchases in Germany. *Financ. Mark. Portfolio Manag.* 20:123–51
- Healy PM, Palepu KG. 1988. Earnings information conveyed by dividend initiations and omissions. *J. Financ. Econ.* 21:149–75
- Heath C, Huddart S, Lang M. 1999. Psychological factors and stock option exercise. *Q. J. Econ.* 114:601–27
- Heron RA, Lie E. 2006. On the use of poison pills and defensive payouts by takeover targets. *J. Bus.* 79:1783–807
- Hietala PT. 1990. Equity markets and personal taxation: the ex-dividend day behaviour of Finnish stock prices. *J. Bank. Finance* 14:327–50
- Hoberg G, Phillips G, Prabhala N. 2014. Product market threats, payouts, and financial flexibility. *J. Finance* 69:293–324
- Hoberg G, Prabhala NR. 2009. Disappearing dividends, catering, and risk. *Rev. Financ. Stud.* 22:79–116
- Hong H, Wang J, Yu J. 2008. Firms as buyers of last resort. *J. Financ. Econ.* 88:119–45
- Hotchkiss ES, Lawrence S. 2007. *Empirical evidence on the existence of dividend clienteles*. Work. Pap., Boston Coll.
- Hribar P, Jenkins NT, Johnson WB. 2006. Stock repurchases as an earnings management device. *J. Account. Econ.* 41:3–27
- Hsieh J, Wang Q. 2008. Insiders' tax preferences and firms' choices between dividends and share repurchases. *J. Financ. Quant. Anal.* 43:213–44
- Huang S, Thakor A. 2013. Investor heterogeneity, investor-management disagreement and share repurchases. *Rev. Financ. Stud.* 26:2453–91
- Hubbard J, Michaely R. 1997. Do investors ignore dividend taxation? A reexamination of the citizens utilities case. *J. Financ. Quant. Anal.* 32:117–35
- Huddart S, Lang M. 1996. Employee stock option exercises: an empirical analysis. *J. Account. Econ.* 21:5–43
- Ikenberry D, Lakonishok J, Vermaelen T. 1995. Market underreaction to open market share repurchases. *J. Financ. Econ.* 39:181–208
- Ikenberry D, Lakonishok J, Vermaelen T. 2000. Stock repurchases in Canada: performance and strategic trading. *J. Finance* 55:2373–97
- Ikenberry DL, Vermaelen T. 1996. The option to repurchase stock. *Financ. Manag.* 25:9–24
- Jagannathan M, Stephens CP, Weisbach MS. 2000. Financial flexibility and the choice between dividends and stock repurchases. *J. Financ. Econ.* 57:355–84
- Jakob K, Ma T. 2004. Tick size, NYSE Rule 118, and ex-dividend day stock price behavior. *J. Financ. Econ.* 72:605–25
- Jensen MC. 1986. Agency costs of free cash flow, corporate finance, and takeovers. *Am. Econ. Rev.* 76:323–29
- Jensen MC, Meckling WH. 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. *J. Financ. Econ.* 3:305–60
- Jenter D. 2005. Market timing and managerial portfolio decisions. *J. Finance* 60:1903–49
- John K, Knyazeva A. 2006. *Payout policy, agency conflicts, and corporate governance*. Work. Pap., New York Univ.
- John K, Williams J. 1985. Dividends, dilution, and taxes: a signalling equilibrium. *J. Finance* 40:1053–70
- Jolls C. 1998. *The role of incentive compensation in explaining the stock repurchase puzzle*. Work. Pap., Harvard Law Sch.
- Jones C. 2002. *A century of stock market liquidity and trading costs*. Work. Pap., Columbia Univ.
- Julio B, Ikenberry DL. 2004. Reappearing dividends. *J. Appl. Corp. Finance* 16:89–100
- Kahle KM. 2002. When a buyback isn't a buyback: open market repurchases and employee options. *J. Financ. Econ.* 63:235–61
- Kalay A. 1982a. Stockholder-bondholder conflict and dividend constraints. *J. Financ. Econ.* 10:211–33



- Kalay A. 1982b. The ex-dividend day behavior of stock prices: a re-examination of the clientele effect. *J. Finance* 37:1059–70
- Kalay A, Michaely R. 2000. Dividends and taxes: a re-examination. *Financ. Manag.* 29:55–75
- Karpoff JM, Walkling RA. 1990. Dividend capture in NASDAQ stocks. *J. Financ. Econ.* 28:39–65
- Kato HK, Lemmon M, Luo M, Schallheim J. 2005. An empirical examination of the costs and benefits of executive stock options: evidence from Japan. *J. Financ. Econ.* 78:435–61
- Kato K, Loewenstein U. 1995. The ex-dividend-day behavior of stock prices: the case of Japan. *Rev. Financ. Stud.* 8:817–47
- Koch AS, Sun AX. 2004. Dividend changes and the persistence of past earnings changes. *J. Finance* 59:2093–116
- Koski JL, Michaely R. 2000. Prices, liquidity, and the information content of trades. *Rev. Financ. Stud.* 13:659–96
- Kruger S. 2013. *Disagreement and liquidity*. Work. Pap., Harvard Univ.
- Kulchania M. 2012. *Market microstructure changes around accelerated share repurchase announcements*. Work. Pap., Marquette Univ.
- Kumar P. 1988. Shareholder-manager conflict and the information content of dividends. *Rev. Financ. Stud.* 1:111–36
- Lakonishok J, Vermaelen T. 1986. Tax-induced trading around ex-dividend days. *J. Financ. Econ.* 16:287–319
- Lakonishok J, Vermaelen T. 1990. Anomalous price behavior around repurchase tender offers. *J. Finance* 45:455–77
- Lambert RA, Larcker DF. 1989. Executive stock option plans and corporate dividend policy. *J. Financ. Quant. Anal.* 24:409–25
- Lambrecht BM, Myers SC. 2012. A Lintner model of payout and managerial rents. *J. Finance* 67:1761–810
- Lambrecht BM, Myers SC. 2014. *The dynamics of investment, payout and debt*. Work. Pap. 2444949, SSRN
- La Porta R, López-de-Silanes F, Shleifer A, Vishny RW. 2000. Agency problems and dividend policies around the world. *J. Finance* 55:1–33
- Larcker DF. 2003. Discussion of ‘Employee stock options, EPS dilution, and stock repurchases’. *J. Account. Econ.* 36:45–49
- Larkin Y, Leary MT, Michaely R. 2014. *Do investors value dividend smoothing stocks differently?* Work. Pap., Penn State Univ.
- Leary MT, Michaely R. 2011. Determinants of dividend smoothing: empirical evidence. *Rev. Financ. Stud.* 24:3197–249
- Lee BS, Rui OM. 2007. Time-series behavior of share repurchases and dividends. *J. Financ. Quant. Anal.* 42:119–42
- Lintner J. 1956. Distribution of incomes of corporations among dividends, retained earnings, and taxes. *Am. Econ. Rev.* 46:97–113
- Litzenberger RH, Ramaswamy K. 1979. The effect of personal taxes and dividends on capital asset prices: theory and empirical evidence. *J. Financ. Econ.* 7:163–95
- Litzenberger RH, Ramaswamy K. 1980. Dividends, short selling restrictions, tax-induced investor clienteles and market equilibrium. *J. Finance* 35:469–82
- Litzenberger RH, Ramaswamy K. 1982. The effects of dividends on common stock prices: tax effects or information effects? *J. Finance* 37:429–43
- Louis H, White H. 2007. Do managers intentionally use repurchase tender offers to signal private information? Evidence from firm financial reporting behavior. *J. Financ. Econ.* 85:205–33
- Marquardt C, Tan C, Young SM. 2007. *Managing EPS through accelerated share repurchases: compensation versus capital market incentives*. Work. Pap., Baruch Coll.
- Massa M, Rehman Z, Vermaelen T. 2007. Mimicking repurchases. *J. Financ. Econ.* 84:624–66
- McKeon SB. 2013. *Firm-initiated versus investor-initiated equity issues*. Work. Pap., Univ. Or.
- Michaely R. 1991. Ex-dividend day stock price behavior: the case of the 1986 Tax Reform Act. *J. Finance* 46:845–59

- Michaely R, Murgia M. 1995. The effect of tax heterogeneity on prices and volume around the ex-dividend day: evidence from the Milan Stock Exchange. *Rev. Financ. Stud.* 8:369–99
- Michaely R, Roberts MR. 2012. Corporate dividend policies: lessons from private firms. *Rev. Financ. Stud.* 25:711–46
- Michaely R, Thaler RH, Womack KL. 1995. Price reactions to dividend initiations and omissions: Overreaction or drift? *J. Finance* 50:573–608
- Michaely R, Vila J-L. 1995. Investors' heterogeneity, prices, and volume around the ex-dividend day. *J. Financ. Quant. Anal.* 30:171–98
- Michaely R, Vila J-L. 1996. Trading volume with private valuation: evidence from the ex-dividend day. *Rev. Financ. Stud.* 9:471–509
- Michaely R, Vila J-L, Wang J. 1996. A model of trading volume with tax-induced heterogeneous valuation and transaction costs. *J. Financ. Intermed.* 5:340–71
- Michel A, Oded J, Shaked I. 2010. Not all buybacks are created equal: the case of accelerated stock repurchases. *Financ. Anal. J.* 66(6):55–72
- Miller MH. 1987. The information content of dividends. In *Macroeconomics: Essays in Honor of Franco Modigliani*, ed. J Bossons, R Dornbush, S Fischer, pp. 37–61. Cambridge, MA: MIT Press
- Miller MH, Modigliani F. 1961. Dividend policy, growth, and the valuation of shares. *J. Bus.* 34:411–33
- Miller MH, Rock K. 1985. Dividend policy under asymmetric information. *J. Finance* 40:1031–51
- Miller MH, Scholes MS. 1982. Dividends and taxes: some empirical evidence. *J. Polit. Econ.* 90:1118–41
- Moser WJ. 2007. The effect of shareholder taxes on corporate payout choice. *J. Financ. Quant. Anal.* 42:991–1019
- Mullins W. 2014. *The governance impact of index funds: evidence from regression discontinuity*. Work. Pap., Sloan Sch. Manag., Mass. Inst. Technol.
- Murphy KJ. 1999. Executive compensation. In *Handbook of Labor Economics*, Vol. 3B, ed. O Ashenfelter, D Card, pp. 2485–563. New York, Oxford, Amsterdam: Elsevier
- Myers SC. 1977. Determinants of corporate borrowing. *J. Financ. Econ.* 5:147–75
- Myers SC, Majluf NS. 1984. Corporate financing and investment decisions when firms have information that investors do not have. *J. Financ. Econ.* 13:187–221
- Nissim D, Ziv A. 2001. Dividend changes and future profitability. *J. Finance* 56:2111–33
- Oded J. 2005. Why do firms announce open-market repurchase programs? *Rev. Financ. Stud.* 18:271–300
- Officer MS. 2011. Overinvestment, corporate governance, and dividend initiations. *J. Corp. Finance* 17:710–24
- Penman SH. 1983. The predictive content of earnings forecasts and dividends. *J. Finance* 38:1181–99
- Pettit RR. 1972. Dividend announcements, security performance, and capital market efficiency. *J. Finance* 27:993–1007
- Peyer U, Vermaelen T. 2009. The nature and persistence of buyback anomalies. *Rev. Financ. Stud.* 22:1693–745
- Peyer UC, Vermaelen T. 2005. The many facets of privately negotiated stock repurchases. *J. Financ. Econ.* 75:361–95
- Popadak J. 2013. *Dividend payments as a response to peer influence*. Work. Pap., Univ. Pa.
- Poterba J. 2004. Taxation and corporate payout policy. *Am. Econ. Rev.* 94:171–75
- Poterba JM, Summers LH. 1984. New evidence that taxes affect the valuation of dividends. *J. Finance* 39:1397–415
- Rantapuska E. 2008. Ex-dividend day trading: Who, how, and why? Evidence from the Finnish market. *J. Financ. Econ.* 88:355–74
- Rau PR, Stouraitis A. 2011. Patterns in the timing of corporate event waves. *J. Financ. Quant. Anal.* 46:209–46
- Rau PR, Vermaelen T. 2002. Regulation, taxes, and share repurchases in the United Kingdom. *J. Bus.* 75:245–82
- Ross SA. 1977. The determination of financial structure: the incentive-signalling approach. *Bell J. Econ.* 8:23–40
- Sarig O. 2004. A time-series analysis of corporate payout policies. *Rev. Finance* 8:515–36
- Shefrin HM, Statman M. 1984. Explaining investor preference for cash dividends. *J. Financ. Econ.* 13:253–82

- Shevlin T. 2008. Discussion of 'Executive stock-based compensation and firms' cash payout: the role of shareholders' tax-related payout preferences'. *Rev. Account. Stud.* 13:252–65
- Skinner DJ. 2008. The evolving relation between earnings, dividends, and stock repurchases. *J. Financ. Econ.* 87:582–609
- Stephens CP, Weisbach MS. 1998. Actual share reacquisitions in open-market repurchase programs. *J. Finance* 53:313–33
- Vermaelen T. 1981. Common stock repurchases and market signalling: an empirical study. *J. Financ. Econ.* 9:139–83
- von Eije H, Megginson WL. 2008. Dividends and share repurchases in the European Union. *J. Financ. Econ.* 89:347–74
- Wada K. 2005. *Stock repurchases in Japan*. Work. Pap., Keio Univ., Jpn.
- Watts R. 1973. The information content of dividends. *J. Bus.* 46:191–211
- Weisbenner SJ. 2000. *Corporate share repurchases in the 1990s: What role do stock options play?* Discuss. Pap. 2000-29, Finance Econ. Discuss. Ser.
- Yagan D. 2014. *Capital tax reform and the real economy: the effects of the 2003 dividend tax cut*. Work. Pap., UC Berkeley
- Young S, Yang J. 2011. Stock repurchases and executive compensation contract design: the role of earnings per share performance conditions. *Account. Rev.* 86:703–33
- Zwiebel J. 1996. Dynamic capital structure under managerial entrenchment. *Am. Econ. Rev.* 86:1197–1215