Institutional Shareholders' Investment Horizons and Abnormal Returns Following Share Repurchase Announcements

– A Product of Market-to-Book Ratios?

Abstract

In this thesis, we evaluate the effects of institutional shareholders' investment horizons on average abnormal returns of companies following share repurchase announcements conditional on market-to-book ratios. We find that institutional investor horizons have insignificant explanatory power in the short-run. However, we find that institutional investor horizons possess significant explanatory power in the-long run for both value and growth stocks. In the case of value stocks, the longer the average investor horizon is, the lower are the abnormal returns following share repurchase announcements. In the case of growth stocks, the longer the average investor horizon is, the higher are the abnormal returns following share repurchase announcements.

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I.   Introduction

It has been extensively documented in contemporary finance literature that over the past two decades share repurchases have become an increasingly important payout method for U.S. firms; at the same time, the growth in cash amounts distributed as dividends declined (Fama and French, 2001; Brav et al, 2005). Concurrently, institutional ownership in the U.S. has experienced remarkable growth and institutional investors today own the great majority of stakes in U.S. firms (Fernando, Gatchev and Spindt, 2012).

In one of the papers laying the foundation for modern finance theory, Modigliani and Miller (1961) show that share repurchases and dividends are perfect substitutes, given perfect capital markets. That is, once investment policy is set, residual cash can be distributed to shareholders either by means of dividends or share repurchases. Agency theory (Jensen, 1986) similarly holds that investors can take control of managers' actions by withdrawing excess cash from the firm. Whether this is accomplished through share repurchases or dividends will not influence the final outcome. Other theories state that dividends and share repurchases are not substitutes since the former payout method attracts institutions (Allen et al., 2000). DeAngelo et al. (2000) conclude that share repurchases are used to pay out temporary extraordinary earnings, while dividends are used to pay out permanent earnings. Summarizing, existing models do not consistently predict a specific relation between dividends and share repurchases.

Why do firms repurchase stock and why has this method of capital distribution grown so considerably over time? The literature is rich with motives as to why firms might do so. Jensen (1986) states that firms repurchase stock to distribute excess cash. Jagannathan et. al (2002) find a positive relation between repurchases and cash flow levels, supporting this hypothesis. Fenn and Liang (2001) argue that offsetting the dilutive impact of employee stock option plans represents an induction for companies to buy back their stock; and Bens et al. (2003) maintain the manipulation of reported earnings per share as an explanatory variable. Dittmar (2000) furthermore argues that balance sheet efficiency and takeover considerations influence firms' decisions to repurchase stock.

Various studies have shown that repurchase activity is negatively correlated with prior stock price developments (e.g. Stephens and Weisbach, 1998; Ofer and Thakor, 1987), implying that companies repurchase stock when they perceive their market price as potentially undervalued. Ikenberry et al. (1998) similarly argue that firms repurchase stock to signal and exploit undervaluation. Many authors in the finance literature find support for this

prevalent view (Dittmar, 2000; Firth, Leung and Rui, 2010;).

Given the growing importance of stock repurchases, and given that – on the whole – companies' primary motive for repurchasing their stock is to signal internally perceived undervaluation, the questions arise whether the information conveyed in announcing market repurchases is on average correctly absorbed by the market and whether company characteristics appear to determine the efficacy of the intended signal.

Recent literature has highlighted the relation between institutional ownership and corporate payout policies (Grinstein and Michaely, 2005; Derrien et al., 2012). While it is a common perception that institutions are attracted by dividend-paying stocks (Allen et al., 2000; Short et al., 2002), there is a growing evidence that institutional investors are allocating significant funds to companies that repurchase shares (Grinstein and Michaely, 2005; Gaspar et al. 2004). Theories and models attempting to explain the interaction between institutional ownership and corporate payouts underline the role of institutional monitoring preferences and abilities. Institutional investors enjoy considerable economies of scale in various dimensions when compared to retail investors. One dimension that differentiates institutional from retail investors due to fund size and scalability is the capacity to devote considerable resources to the monitoring of corporate affairs. However, while some relevant theories are based on the premise that monitoring behaves symmetrically across institutions (Allen et al., 2000), others state the actual degree of monitoring administrated by institutions depends on the institutional characteristics (Gaspar et al., 2004). Put differently, do all institutions devote proportionally equal resources to the monitoring of corporate affairs or does the extent of their monitoring activities depend on their investment styles and/ or other institutional characteristics?

In this thesis, we evaluate the effects of institutional shareholders' investment horizons on average abnormal returns of companies following share repurchase announcements. We stipulate that institutions conduct more monitoring of corporate affairs than retail investors do. However, we depart from the premise that monitoring does not vary across institutions. We argue that long-term institutional investors are more inclined than short-term institutional investors to monitor corporate affairs since long-term investors are more likely to reap the corresponding benefits from devoting resources to monitoring. Furthermore, we assume that long-term investors prefer dividends over share repurchases while short-term investors prefer share repurchases over dividends, which is consistent with existing literature (Gaspar et al. 2004); and that agency cost are lower for companies whose principals have a long-term horizon. Hence, we expect that companies that are announcing share repurchases and are held

primarily by long-term investors should *on average* exhibit higher average abnormal returns following repurchase announcements than companies that are announcing share repurchases and are held primarily by short-term investors. This should result from the fact that in the first case (long-term investors) the decision to repurchase shares is better monitored and less likely to bear significant opportunity cost than in the second case (short-term investors). However, we posit that this effect will *vary conditional on market-to-book ratios*. A share repurchase should theoretically be value-reducing if it is an imperfect decision, i.e. in cases where better investment opportunities exist. Given the assumption that long-term investors are more inclined to monitor, the decision to repurchase shares by firms that are held by long-term investors should be more likely to be value-creating. Furthermore, companies should be more inclined to announce share repurchases when they perceive their current market price as potentially undervalued, which is more likely to be the case for low market-to-book (value) stocks and less likely to be the case for high market-to-book (growth) stocks. Hence, the value that the market assigns to the monitoring of corporate affairs should diminish for value stocks but be enhanced for growth stocks. Conditional on the lower monitoring value assigned to value stocks, investor horizons should for value stocks not affect the perceived value of a share repurchase. However, under the assumption that short-term investors prefer share repurchases over dividends, catering to these preferences should create a higher market reaction to a share repurchase announcement to a value stock that is primarily held by short-term investors. Given the fundamental difference between value and growth stocks, we intend to analyse how the effects of institutional shareholders' investment horizons on average abnormal returns following share repurchase announcements differ for these two stock groups.

The remainder of our thesis is organized as follows. Section II discusses two partially contradictory findings in the literature on the interaction between institutional ownership and corporate payout policies, subsequent research and the motivation for our thesis. Section III lays out the argumentation based on which we develop our hypothesis and section IV consequently presents the testable propositions. Section V reviews the main determinants of choice companies consider when choosing between dividends and share repurchases and discusses why share repurchases may have become an increasingly important payout method for U.S. firms. Section VI presents our data sample followed by our analysis and methodology in section VII. Thereafter, our results are presented and discussed and our conclusions will be drawn.

II.   Two Opposing Findings in the Recent Literature

Related literature has highlighted the relation between institutional investors and corporate payout policies.

Grinstein and Michaely (2005) analyse the relation between institutional ownership and payout policies. Using a broad data set of U.S. institutional holdings and corporate payouts between 1980 and 1996, they provide a number of new results on the relation between institutional holdings and payout policy. When comparing dividend-paying with non-dividend paying firms, they find clear evidence that institutions prefer dividend paying stocks, even after controlling for size, risk, market-to-book ratio and other variables of relevance (Grinstein and Michaely, 2005). Furthermore, they find that institutional investors do not appear to exhibit any preference for firms paying high dividends. Rather, they find evidence that institutions in fact prefer low-dividend to high-dividend paying stocks and that firms which increase their dividends do not attract more institutional holdings by doing so. Hence, they find no support for the notion that higher dividends lead to higher institutional ownership, as some other theories suggest (Allen et al, 2000). Finally, and of particular interest for this paper, Grinstein and Michaely (2005) find that institutional investors show a preference for firms that repurchase shares. Their evidence indicates that institutional ownership is higher for repurchasing firms than for non-repurchasing firms. However, unlike in the case of dividends, they find that the more the firms are repurchasing shares – relative to their market capitalization, their book value of assets or their earnings – the higher is their degree of institutional ownership. Their evidence further indicates that when firms are changing their repurchase policy, the degree of institutional ownership changes symmetrically (Grinstein and Michaely, 2004).

This documentation is partially contradictory to the common perception that institutional holdings are associated with firms paying more dividends and better corporate governance, due to better monitoring capabilities and informational advantages of institutional investors (Allen et al., 2000).

Allen et al. (2000) develop a model in which they bring forward the argument that dividends are paid by corporations in order to attract and retain institutional investors whose presence ensures that the firms remain well run. Given their scale and capacities, institutions are more likely than retail investors to become informed about companies and to conduct "due diligence" analyses in order to evaluate whether or not firms are well run by their managements. Once institutions are informed about a company and decide to invest, their

ability to vote in large blocks ensures that the firm remains well managed, e.g. by means of facilitating takeovers or becoming directly involved in corporate governance processes in cases where management underperforms. Management, on the other hand, being aware of that, chooses to pay dividends accordingly. Given that management is confident that a 'good' quality of the company will be revealed when being subject to institutional monitoring, management consequently aims to attract institutions by signalling this quality through dividends. Once a company has signalled its quality through the payment of dividends and institutions acquired stakes in the company, Allen et al. (2000) argue, the institutions will be of continuous value to the firm period after period through the ongoing monitoring of corporate affairs. Therefore, the firms that intended to attract institutions by paying dividends will be inclined to continue incentivising the institutions to remain shareholders period after period through a constant dividend policy. This is consistent with the observation of dividend smoothing (Lintner, 1956), as a dividend reduction would be considered as an indication of the desire to reduce institutional ownership and the related oversight of corporate affairs.

This partial contradiction has motivated further research surrounding the relation between institutional ownership and share-repurchasing companies. In particular, Gaspar et al. (2004) examine how the investment horizons of institutional shareholders influence firms' payout decisions. They find that firms held by short-term institutional investors have a higher propensity to repurchase shares instead of paying dividends, while firms with long-term monitoring institutions tend to pay dividends instead. This evidence suggests that firms seem to accommodate a greater preference of short-term investors for share repurchases, which offer these shareholders the chance to cash out of their investments. Furthermore, they report lower market returns for repurchasing firms initiating payouts that are held primarily by short-term investors, supporting the prediction that long-term institutions have better monitoring skills or information.

In our thesis, we do not intend to analyse the interaction between institutional ownership on the choices of corporate payout policies since these are predetermined in our evaluation – we only exploit share repurchases. However, given the existing debate in the finance literature over the relation between institutional ownership and corporate payouts as well as the growing importance of share repurchases as payout method, we intend to contribute a discussion of the signalling power that institutional ownership – and by theoretical implication, institutional monitoring – possesses for corporations that announce share repurchases. Furthermore, following Gaspar et al. (2004), we would like to add research to literature on causes of abnormal returns associated with share repurchases by analysing the

effects of institutional shareholders' investment horizons on abnormal returns following repurchase announcements conditional on market-to-book ratios, i.e. for value stocks versus growth stocks.

The following section will lay out the argumentation based on which we develop our hypothesis and testable propositions, which will be presented in section IV.

III. Institutional Shareholders' Time-Horizons and Corporate (Payout) Policies

In this section we discuss fundamental attributes of institutional investors and how they may relate to choices of corporate payout policies. The arguments presented will be the premise for our hypothesis and the testable propositions.

Institutional ownership in U.S. companies has increased considerably over the past five decades, and institutional investors today own the great majority of outstanding stakes in U.S. corporations (Fernando et al. 2012). There are several fundamental attributes in which institutional investors differ from individual (retail) investors. Generally, institutional investors manage large pools of funds and hence, invest larger amounts per security. Because they have large assets under management at stake, they should have higher incentives to dedicate resources to monitoring capabilities (Hartzell and Starks, 2003). Furthermore, they possess various coordination mechanisms to increase their effectiveness in monitoring, which are in place even for allocations where they do not hold significant blocks of shares in a corporation (Hartzell and Starks, 2003). Institutional investors are also more likely to be better informed about corporate affairs than individual investors. On the one hand, institutions allocate significant resources to gathering and exploiting information. On the other hand, institutions often are privy to corporate information that individual investors do not have access to (Boehmer and Kelly, 2009).

Based on these distinct attributes of institutions, it has been argued and commonly assumed in the finance literature that institutional are better than retail investors at monitoring corporations and that institutions enjoy informational advantages in comparison to retail investors.

Moreover, institutions possess two other attributes that significantly differentiate them from individual investors. These are taxes and regulations. For example, in the United States, corporate and public pension funds, university endowment funds and non-profit institutions do not pay taxes on dividends and capital gains (Allen et al., 2000). This attribute may create

a tax-based institutional clientele (Grinstein and Michaely, 2004). With respect to regulations, institutions are fiduciaries (Gompers and Metrick, 1998). They pool funds and allocate these on behalf of others and are thus subject to principal-agency conflicts. Consequently, they appear to be constrained by several regulations that are designed to prevent them from speculating with other people's money. Institutions governed by 'prudent-man' rules, e.g., invest relatively high proportions of their assets under management in 'prudent' stocks (Grinstein and Michaely, 2004). Indicators of prudence that have been put forward in the literature are years since initial listing, length and stability of dividends and earnings records and high degrees of external validation (Del Guercio, 1996).

The conjunction of their comparatively better monitoring and information handling capabilities and the advantages that some forms of payout methods offer institutions have caused researchers to motivate an interaction between institutional holdings and corporate payout policies.

However, institutional investors, on the whole, appear to be far from homogenous across different dimensions (Gompers and Metrick, 2001). One of the characteristics in which they certainly differ is the average time-horizon or holding period of their investments. These can differ since the maturities of their liabilities or of their sources of funds differ. Pension funds, e.g., usually have long-term liabilities and hence, typically relatively long-time horizons with respect to their investments. Mutual funds, in turn, may be subject to large short-term redemptions and accordingly, their time investment horizons are commonly relatively short (Derrien et al., 2012).

In the theoretical framework of perfect capital markets, the price of a share in a firm equals its fundamental value – irrespective of who is holding it. There is no informational asymmetry and no mispricing of securities. Managers' investment decisions maximize the firm's fundamental value and these decisions are fully reflected in and discounted into the firm's stock price. Moreover, investors can meet their liquidity needs by selling their shares before the firm's investments pay off. In practice, frequently not all the stakeholders in a company as well as the (potential) market participants enjoy symmetrically perfect information about the true value of the company – which inevitably results in temporal mispricing.

Consider a company whose stock is temporarily priced below its fundamental value since the entire information about its true value is currently not reflected in its market price. Derrien, Kecskes and Thesmar (2012) develop a model in which they show that temporal mispricing affects long-term investors differently than short-term investors, and that long-

term investors attenuate the effects of mispricing on corporate policies. In the case of a temporarily under-priced stock, they argue, managers' investment decisions are not fully reflected in the firm's stock price (Derrien et al., 2012). This creates a tension between investors having different investment time-horizons since long-term investors may be able to wait until the mispricing is revealed and corrected, while short-term investors may have to sell their shares when the firm is still mispriced. Consequently, short-term investors will prefer less (re-)investment on site of the firm than long-term investors. Given that the company's management maximizes the wealth of the company's average investor and that the firm is undervalued, the shorter the horizon the firm's average investor is, the less managers will invest. As this example illustrates, they show that investor horizons affect corporate policies when firms are mispriced and more importantly, that the interests between firms' managements and their investors are more likely to be aligned when predominantly long-term investors are holding the companies' shares. In other words, in the case of temporal mispricing, the degree of agency cost associated with the price-correction via corporate policies is not symmetric across principals with varying investment time-horizons, ceteris paribus. The longer the time-horizon of the average principal – i.e. investor – is, the lower should be the agency cost caused by imperfectly aligned interests.

Given the variable degree of agency cost associated with investor time-horizons, a more specific corporate policy dimension, which is affected by the shareholders' time-horizons is payout policy. When it comes to the choice between paying dividends and pursuing stock repurchases, investors with different time horizons will have divergent utilities and hence, preferences. These primarily exist due to transaction costs and incentives to devote resource to monitoring capacities. Short-term investors will generally prefer stock repurchases over dividends due to transaction costs (Gaspar et al., 2004). They are expected to sell their holdings in a firm within a relatively short time-horizon and place great importance on the price at which they will be able to sell. Stock repurchases, in turn, can be utilized to act as a buffer against the market impact of their selling pressure (Chan and Lakonishok, 1995). Long-term investors, in contrast, will generally prefer dividends over stock repurchases (Gaspar et. al, 2004). On the one hand, their longer holding period implies that they are more likely to face considerably high capital gains taxes when selling their shares. Being in that way 'locked' in a stock, dividends may the more appealing payout method to long-term investors since they do not force them to realize capital gains (Gaspar et al. 2004) and provide a relatively stable stream of cash flows (Lintner, 1956). On the other hand, being invested in a company for the long-run, long-term investors are likely to devote a higher degree of

resources to monitoring capabilities and interference in in corporate affairs, which makes them better informed to assess the firm's investment opportunities. Given this relatively low degree of informational asymmetry, a stock repurchase can be expected to be undertaken only if there are no opportunity cost of doing so, i.e. no better (re-)investment possibilities on the firm-site. Finally, long-term investors appear to be commonly following more prudent investment styles exhibiting a preference towards stable stocks with a proven record of paying dividends (Del Guercio, 1996).

A question that arises from the previous argumentation is whether shareholders' investment horizons and their interaction with corporate payout policies have any implications for firm values. It can be argued that the pressure of short-term investors to liquidate their holdings leads the respective firms on average to buy back shares too often. Put differently, firms held primarily by short-term investors may tend to pay out capital in the form of stock repurchases even if better corporate (re-)investment opportunities exist. Long-term investors, however, being better informed about the true value of the firms' investment opportunities may be better able to assess the true value of a capital payout, i.e. whether in these cases a stock repurchases is actually reducing rather than creating value to the firm. Hence, firms that are held and monitored by long-term investors should on average be associated with better payout decisions. In fact, Gaspar et al. (2004) report that firms held primarily by short-term institutional investors have a higher propensity to repurchase shares instead of using dividends. They argue that firm managers seem to respond to the preferred payout policy of predominant investors in their shareholder base. Share repurchases are utilized by firms if managers want to appease short-term oriented institutional shareholders, while firms pay dividends if their stock is mostly held by long-term institutional investors who have less need to liquidate their investments (Gaspar et al. 2004). More importantly for our thesis, however, Gaspar et al. (2004) report that the market reaction to payout initiations by firms also varies across the time-horizons of the predominant investors in respective firms' shareholder bases. In particular, the more the firms initiating payouts through share repurchases are held by short-term oriented institutional investors, the lower is the market reaction to these payout initiations; post-announcement returns for payout initiations through share repurchases by firms that are held primarily by long-term institutional investors are indeed exceeding the returns for firms that are held primarily by short-term institutional investors. The market seems to assign a positive value to the better monitoring ability of long-term investors. Hence, it reacts more positively to announcements by firms held by long-term investors, as such payout decisions are less likely to destroy value (Gaspar et al., 2004). This

argument is in line with a recent finding by the same authors showing that firms held by long-term investors tend to engage in better acquisitions while short-term shareholders provide more leeway for corporate managers to overbid and carry out value-reducing acquisitions (Gaspar et al. 2004).

IV. Hypotheses and Testable Propositions

Our evaluation of the effect of institutional shareholders' investment horizons on average abnormal returns of companies following share repurchase announcements conditional on market-to-book ratios can be synthesized into the two following testable propositions:

H1: Low market-to-book ('value') stocks held by short-term investors should exhibit higher average abnormal returns following share repurchase announcements than low market-to-book ('value') stocks held by long-term investors.

Given that value stocks are on average more likely than growth stocks to be repurchased due to internally perceived undervaluation, the incremental monitoring value the market assigns to institutions holding value stocks that announce share repurchases should be relatively low. Furthermore, given the preference of short-term investors for share repurchases, the market reaction following share repurchases should be higher for value stocks held by short-term investors than for value stocks held by long-term investors.

H2: High market-to-book ('growth') stocks held by long-term investors should exhibit higher average abnormal returns following share repurchase announcements than low market-to-book ('growth') stocks held by short-term investors.

Given that growth stocks are on average less likely than value stocks to be repurchased due to internally perceived undervaluation, the incremental monitoring value the market assigns to institutions holding growth stocks that announce share repurchases should be relatively high. Thus, the market reaction should in the case for growth stocks held by long-term investors, who are more inclined to monitor, be higher than in the case for growth stocks held by short-term investors.

The following section is intended to discuss the main determinants of choice for companies evaluating the redistribution of capital to their investors via dividends or stock repurchases. Furthermore, it will be addressed why stock repurchases have been growing so

significantly over time relative to dividends. Thereafter, section VI will proceed with the data generating process utilized followed by the methodology underlying our analysis.

V.   Main Determinants of Choice between Dividends and Stock Repurchases

Consistent with finance theory companies appear to follow a procedure in which they first decide whether to pay out idle cash to shareholders, or not. This decision is generally dependent upon the rate of return of available (re-)investments and the cost of capital (De Jong et al., 2002). In the second stage the firm decides in which form to distribute the idle cash: Dividends, share repurchases, or both.

The most prevalent type of dividend is the cash dividend (Ross et al., 2005). Public firms commonly pay *regular* cash dividends on a fixed yearly basis and occasionally *extra* cash dividends. Another type of dividend is distributed in shares of stock, referred to as *stock dividend*. Thereby the firm basically declares a stock split, increasing the number of shares outstanding and reducing the share value proportionally. Stock dividends usually are stated as percentage.

A firm can accomplish stock repurchases generally in two ways. In an *open-market repurchase*, firms are not required to reveal themselves as buyers or to announce the repurchase – even though in most cases firms do the latter (Brennan and Thakor, 1990). Most open-market repurchase programs, however, extend over several months and even years, which makes it difficult for investors to determine whether the repurchase occurs on any given date, or not. With a *tender offer*, the firm announces to its shareholders that it is willing to buy a specific amount of stock at a given price (Ross et al., 2005). Thereby the tender price is usually set above the current stock price in order to create an incentive for current shareholders to sell their holdings. Though tender offers occur relatively rarely, they typically are considerably larger in magnitude than open-market repurchases (Brennan and Thakor, 1990).

Whenever the term *dividend* is used in the following section, it refers to a cash dividend, unless stated otherwise. The term *stock repurchase* will refer to an open-market repurchase or be specified accordingly. The following sub-sections addresses the main decision determinants a firm's management considers when choosing between dividend distributions (increases) and stock repurchases.

V.   1. Distribution of Excess Capital

Given that a company's excess capital exceeds its (re-)investment opportunities, the company can either decide to retain cash or to distribute it to its shareholders (Jensen, 1986). Like paying dividends, repurchasing stock is one method of distributing cash to a company's shareholders. Companies at particular risk for over-investing, or investing in non-productive assets, are those with large amounts of excess capital for which no positive-NPV projects exist (Grullon and Ikenberry, 2000). Like dividends, share repurchases are an effective instrument for addressing such potential free cash flow problems by reducing management's ability to divert capital to uses that are not in the best interest of shareholders (Jensen, 1986). Stock repurchases, however, may be preferred over dividend payments primarily for two reasons. On the one hand, in an open-market stock repurchase – which is the most prevalent repurchase type – the company does with the announced intention to buy back shares not commit itself to actually pay out excess capital (Oded, 2005). On the other hand, stock repurchases, as opposed to dividends, are not expected to recur on a regular basis. Therefore, stock repurchases offer more flexibility (treated in more details in section III.8) than dividends in distributing cash to shareholders since the market appears to penalize companies when dividend distributions are subsequently reduced (Denis, Denis and Sarin, 1994).

V.   2. Equity Undervaluation

Given there is information asymmetry between a firm's management and its shareholders, and given management knows the firm's shares are undervalued, it can raise their long-term value by repurchasing them. When asked why initiating stock repurchases in a study conducted by Bartov et al. (1998), managers typically answered the stocks look "cheap" relative to their long-term projections of cash flows. That is, management may simply consider the firm's own stock as an attractive investment opportunity when it perceives it as undervalued. Furthermore, Vermaelen reported in a 1981 study positive stock market responses to announcements of stock repurchases and in a more recent study (Vermaelen et al. 1998) the authors find that the mean return of companies undertaking stock repurchases to exceed a benchmark portfolio by more than 12% over a four-year period following the announcements. As they concluded in the same study, "managers [...] appear to have been correct, on average, in assuming they can buy the shares at bargain prices to the benefit of their long-term shareholders" (Vermaelen et al., 1998). To put things into perspective, raising dividends typically also leads to stock price appreciations (Ohlson, 2001), which is in line with what

finance theory suggests (Ross et al., 2005). These stock price increases, though, accrue to all current shareholders in equal proportion. When it comes to stock repurchases, by contrast, better informed shareholders (potentially including the firm's management) and those who do not sell enjoy disproportional benefits from future stock price increases. These different effects on long-term share values in fact show to be an important management concern when choosing between dividend increases and stock repurchases (Bartov et al., 1998). More specifically, they lead management in the case of information asymmetry and perceived equity undervaluation to favour stock repurchases over dividend distributions.

V.   3. Management Compensation

Granting stock options and stock appreciation rights as part of employees' compensation has increased substantially over the past two decades (Bartov et. al., 1998). For example, Engel (1995) found that the proportion of stock options granted as part of the total compensation of chief executive officers of U.S. commercial banks was 28% in 1993 and climbed to 34% in 1994. Managerial option plans usually are not dividend protected; Murphy (1999), e.g., reported that only 1.1% of stock option plans by U.S. firms are dividend protected. Such compensation models generally induce management to distribute excess cash in the form of share repurchases rather than as dividends, for two reasons.

First, stock options for management are naturally granted as call options. These options, in turn, deteriorate when higher dividends are paid to shareholders (Black and Scholes, 1973). Additionally, share repurchases lead to fewer claims on the company so that each shareholder's stake becomes proportionally larger and hence, more valuable. Thus, as mentioned before, announcements of stock repurchases are usually accompanied by positive stock market responses. Second, the use of stock options as part of employees' compensation dilutes stakes in the company. In an attempt to offset this dilution and return value to the firm's shareholders, management may prefer stock repurchases to dividends as a way of paying out excess cash.

V.   4. Extent of Holdings by Institutional Investors

It has been argued that sophisticated institutional investors may generally prefer stock repurchases to cash dividends (Ross et al., 2005). This view is primarily based on income-tax considerations. The marginal tax rate on dividends – which are taxed as ordinary income – generally exceeds that on capital gains. Moreover, the whole amount received as cash dividend is subject to income taxes, whereas only the part of the proceeds from selling a security is taxed that actually accounts for a realized capital gain. This proportion may amount to only a fraction of the actual proceeds. In addition, dividends are taxed when they are paid, while capital gains taxes can be deferred until the final security sale. Therefore, even for the case that marginal capital gains taxes equal the marginal taxes on ordinary income, the effective tax rate on capital gains actually may be lower than the effective rate on dividend income. Hence, selling shares rather than receiving dividends should typically result in more favourable after-tax consequences for taxable investors. In other words, stockholders (including institutions) who wish to maximize their after-tax cash flows from security holdings will favour cash distributions via stock repurchases over cash distributions via dividends.

V.   5. Relative Investor Taxation and Clientele

The previous sub-section implicitly argued that since dividends are taxed at a higher rate than capital gains, firms that pay dividends are at a competitive disadvantage because they may face a higher cost of equity than firms, which do not pay dividends.

Yet there are theories holding that some managers of firms have an incentive to pay dividends rather than to repurchase shares, even though capital gains taxes have preferential tax treatment for *all* investors (Allen et al., 2000). This results from different taxations of institutional and individual investors. For example, in the United States, corporate and public pension funds, university endowments, labour unions, foundations and other institutions are either fully or largely exempt from taxes (Allen et al., 2000). The proportion of securities held by such institutions has been significant for many years and increased substantially since the 1980s (Allen et al., 1998). In contrast to retail investors, such institutional investors typically enjoy economies of scale due to their asset size reached by pooling funds. Moreover, they usually hold relative large proportions of equity in the firms in that they invest and therefore, are able to vote in large blocks. Thus, institutional investors are generally better able to become informed (e.g. by means of a 'due diligence' analysis) about the firms whose

securities they hold. Additionally, they have a greater incentive to do so. In fact, institutional investors' involvement in corporate governance has grown substantially in recent years (Allen et al., 2000). On the one hand, such involvement in a firm's corporate governance will facilitate the detection of poor management by a widening of monitoring capabilities. On the other hand, institutions might also add value to the firm by expanding general resources accessible for business conduct. Based on these arguments, Allen et al. (2000) developed a signalling and agency model in which firms attract and take advantage of institutional investors. That is, if management is confident about future cash generation it may signal this perception by increasing (taxable) dividends. This in turn attracts institutional investors due to their comparative tax advantage. The consequent presence of institutional shareholdings will make it more likely that the true firm quality and value will be revealed. Given that management does not perform well, institutions might become active in the corporate governance or facilitate takeovers by selling large blocks of their stock. If the firm is run well by management, the institutional shareholdings might add value to the firm by leveraging combined business resources.

This reasoning is contradictory to the previous sub-section. It is, however, consistent with two basic concerns in the dividend literature: Why dividends are paid despite their tax disadvantage and why they are 'sticky'. First, it establishes incentives of firms to pay dividend, as presented previously. Second, firms that distribute dividends and have high institutional shareholdings would experience the most significant consequences from cutbacks in dividends. Thus, they rather prefer to 'stick' to their payout policy. Firms that have chosen stock repurchases, by contrast, attract another clientele that is less able to effectively express resistance to changes in the payout policy.

V.   6. Optimal Leverage Ratio

When a firm distributes capital to its shareholders by means of stock repurchases, it reduces its equity and increases its leverage ratio. Hence, given that an optimal leverage ratio exists and current leverage ratios are below these optima, companies may use stock repurchases to achieve their target ratios (Opler and Titman, 1996) and increase their market value. If a company's leverage ratio is below its target ratio, it may therefore be more likely to repurchase stock rather than to pay a dividend.

V.   7. Takeover Deterrence

The previously discussed determinants relate the choice between paying dividends and repurchasing stock to internal company decision making affecting the firm and its capital contributors. Yet, repurchases may as well influence the relation between the company, its investors and outside parties. Hodrick (1996) proves the existence of shareholder heterogeneity and an upward sloping supply curve of shares. Given the characteristics of an upward sloping supply curve of a company's stock, a potential takeover target can increase the cost of an acquisition price since existing investors selling their shares in a stock repurchase are those investors with the lowest reservation values (Dittmar, 2000). Therefore, a stock repurchase can be utilized as a takeover defence by target companies because repurchasing their stock can increase the lowest price in the market for which its stock is available (Bagwell, 1991). Thus, companies that are at a relatively high risk of becoming a takeover target are more likely to undertake stock repurchases than paying dividends in distributing cash to shareholders.

V.   8. Flexibility

Firms usually view dividends as long-term commitment to their shareholders since the latter consider dividends a given income stream over time, which is discounted in the current stock price and not likely to be cut (Ross et al., 2005). Therefore, executives are hesitant to reduce existing dividends as dividend cuts are difficult to be accomplished without adversely affecting the firm's share price. Repurchases, in contrast, do not represent such a commitment. They are rather seen as non-recurring events. Hence, firms enjoying persistence in cash flows are more likely to pay dividends. Contrarily, firms with more volatile changes in cash flows are more likely to repurchase stocks. DeAngelo et al. (2000) examined the relationship between the disappearance of special dividends and the appearance of repurchase programs. They did not find support for the hypothesis that share repurchase programs substituted special dividends. In fact, special dividends were replaced or "absorbed" by regular dividends. Moreover, Jagannathan et al. (2000) found that firms distributing dividends enjoy more stable earnings than firms that repurchase shares. They conclude that dividends are used to pay out permanent earnings, while repurchases are used to pay out extraordinary earnings.

The following section will present the construction of our overall data sample as well as the rationale for our main explanatory variable. Thereafter, our methodology and the subsequent analysis will be presented.

VI. Data

Our data sample was formed by initially identifying all stock repurchase announcements by listed U.S. companies excluding regulated utilities and financials reported in the *Security Data Corporation* (SDC) Database between 2000 and 2010. We examine all open market share repurchase announcements without regard to whether the programs were actually completed, which is consistent with the approach employed by Ikenberry et al. (1998). We further require that these firms are included on the daily *Center for Research in Security Prices* (CRSP) *NYSE* and *CRSP NASDAQ* records as well as the *CRSP-Compustat Merged Industrial Database* at the time of the announcement. Further, we obtain information on firm characteristics from *Compustat*. We use data on the quarterly holdings of institutional investors that have discretion over 13F securities worth $100 million or more from *Thomson Financial*[1] to calculate the investor horizons. We require that for each observation we obtain data on all our main explanatory variables. This results in a total of 1119 observations.

Figure 2 in the Appendix depicts the annual number of announced share repurchases between the years 2000 and 2010. The annual announced number of share repurchase shows an increasing trend between 2000 and 2006, with the peak of observed annual share repurchase announcements occurring in 2006 where there were an excess of 150 share repurchases announced. While in 2008 there as still a moderately high number of announcements (slightly more than 100), during 2009 this number dropped significantly to approximately 50, followed by an increase to more than 100 announcements in the year 2010. Figure 3 in the Appendix furthermore represents the total yearly value of announced share repurchases between 2000 and 2010. While the trend between 2000 and 2006 is not as significantly positive as in the case for the number of announcements, the total value of share repurchase announcements appears to be the highest in 2007 with announced share repurchases amounting to more than U.S. Dollar 2.5 billion followed by considerably decreased volumes during 2008 and 2009.

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[1] The U.S. Securities and Exchange Commission (SEC) requires that investment managers with discretion over 13F securities worth $100 million or more report all equity positions greater than 10,000 shares or $200,000 to the SEC at the end of each quarter

Our main explanatory variables are: *Investor turnover, firm size, market-to-book ratio, debt-to-equity ratio, liquid assets, stock liquidity, institutional investors' concentration, payout percentage* and *institutional holdings*. The construction of and the rationale for *investor turnover* is explained in section VI. 1. *Firm size* is defined as the average natural logarithm of total assets over the last three years prior to the repurchase announcement. We include *firm size* since we expect that it is reflecting informational asymmetry in the sense that small firms are more likely to hold private information that is not available to the market. The *market-to-book ratio* is specified as the average market capitalization divided by the average book value of equity over the last three years prior to the repurchase announcement. These values are divided into quartiles, where the largest and smallest quartile will form the growth and value stock portfolios, respectively. The *debt-to-equity* ratio is defined as the ratio of the average long-term debt to the average book value of equity over the last three years prior to the repurchase announcement. Leverage ratios are included since share repurchases may be implemented in order to increase the firms' debt-to equity ratios and to consequently move closer towards optimal capital structures. *Liquid assets* are specified as the three-year average values of the difference between current assets and current liabilities divided by the firms' total assets. We include *liquid assets* since firms with relatively high levels of excess capital are at a higher risk of over-investing, or investing in non-productive assets. One way to partly mitigate such potential free cash flow problems is to return cash back to shareholders and subsequently reduce management's ability to divert capital to uses that are not in the best interest of shareholders. *Stock liquidity* is defined as the sum of the volume traded over the calendar year divided by the firms' number of shares outstanding at the end of the calendar year. We include *stock liquidity* since share repurchases may be utilized as an instrument to improve the respective stock's liquidity by increasing the depth on the buy-side of the market. The *institutional investors' concentration* is specified as the square root of the Herfindahl-index [2] of the institutional ownership in the firms. This variable is incorporated as a measurement of institutional monitoring, since the more concentrated the holdings of institutional investors are, the higher is the degree of monitoring likely to be administrated by the institutions. *Payout percentage* is defined as the value of the share repurchase authorized divided by the current market capitalization. The announced payout size is expected to be directly related to the efficacy of the signal and the motivation from the firm's perspective to

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[2] $HI = \sum_{i=1}^{N} a_i^2$ where $a_i := \frac{x_i}{\sum_{j=1}^{N} x_j}$ with x_i corresponding to the institutional investors' respective number of shares held and $\sum_{j=1}^{N} x_j$ representing the total number of shares held by institutions.

undertake a share repurchase. Finally, *institutional holdings*, similar to the institutional concentration, are expected to reflect the degree of monitoring the companies are subject to and are specified as the number of shares held by institutional investors divided by the total number of shares outstanding

Descriptive statistics of the main explanatory variables are depicted in Table 1 in the Appendix.

VI.   1. Measuring Investor Horizon

We understand the investor horizon as a permanent characteristic of the investor's trading style being associated with its specialization, preferences or funding structure. Institutional investors with long-term horizons should have relatively long holding periods while short-term institutional investors should buy and sell more frequently. Therefore, following the approach utilized by Cella et al. (2011), we measure the time horizon of investors by using a proxy for the investors' portfolio turnover. The churn ratio of an institutional investor *i* holding an investment set of firms denoted as *Q* is calculated as follows:

$$CR_{i,t} = \frac{\sum_{j \in Q} |N_{j,i,t}P_{j,t} - N_{j,i,t-1}P_{j,t-1} - N_{j,i,t}\Delta P_{j,t}|}{\sum_{j \in Q} \frac{N_{j,i,t}P_{j,t} + N_{j,i,t-1}P_{j,t-1}}{2}}$$

where $P_{j,t}$ and $N_{i,j,t}$ are the price and the number of shares of stock *j* held by the institutional investor *i* at quarter *t*. The value range of the churn ratio is from 0 to 2. Gaspar et. al (2005) formalized this measure, which is similar to the measures of institutional investors' trading horizons used by Carhart (1997), Barber and Odean (2000), Bushee (2001) as well as Yan and Zhang (2009). For the companies announcing share repurchases, we calculate the churn ratios of all the available institutional investors in the firm for the last four quarters prior to the announcement and average it over this period. We finally weigh these churn ratios in relation to the investor's number of shares over the total number of institutional shares – which will serve as our proxy for the time horizon of the institutional investors in the firm (the *investor turnover*).

VII. Methodology

VII. 1. Overview

The analysis is divided into two main sections: The short-run analysis and the long-run analysis. Both will yield a portfolio development and regression analysis, however, the emphasis will vary. In the short-run we will try to describe what factors drive abnormal returns in the days succeeding share repurchase announcements. Hence, in this scenario the regression approach will be of primary importance and the portfolio development will serve as an illustrative tool. Given the nature of a long-run analysis, where utilizing any model for the prediction of expected returns is highly debatable, the portfolio development analysis will serve as the foundation based on which conclusions will be drawn. Although long-run abnormal returns are debatable, a regression analysis will be conducted to emphasize simple differences between portfolio developments.

VII. 2. Short-Run Analysis

To conduct the short-run regression analysis and portfolio development analysis, an event study of the repurchase announcement will be conducted.

VII. 2. a) Event-Study

In testing our hypothesis, we generally follow the framework of an event study as originally developed by Fama et al. (1969). This approach utilizes the market capitalisation of a listed company to capture the net present value of all future cash flows to the company. Changes in the market capitalisation thereby depict effects induced by events impacting the valuation of the future cash flows to the firm. The market furthermore is assumed to control for all relevant information surrounding the company's operations. Hence, this analysis relies on three crucial assumptions. First, it assumes that the model for normal prices is well specified, implying that in the absence of the event, the price of the stock of the firm analysed would be close to the 'normal' price after the event. Second, it is assumed that relevant information on the event is not transmitted into the stock price prior to the event. Finally, it follows the efficient market hypothesis in the sense that all relevant information is instantaneously reflected in the stock price after the occurrence of the event.

We use the announcements of open-market share repurchases as the event, not the actual share repurchases itself, since this is consistent with analysing the market reaction once the information has become publicly available.

VII. 2. a) i. Estimation and Event Window

We use one year as estimation window if the last repurchase announcement was more than 400 days ago, otherwise we use the last available estimation period where this was the case leading to an estimation period of:

$$\tau_i \in \;]T_i - 370, T_i - 5] \quad (1)$$

for firm i announcing a share repurchase at T_i in case that the last repurchase announcement was at least 400 days ago. This is intended to avoid a contaminated estimation period, in other words, the estimation period should not overlap with the previous event window. Figure 1 depicts the chosen event and estimation window.

Figure 1: Estimation and Event Window
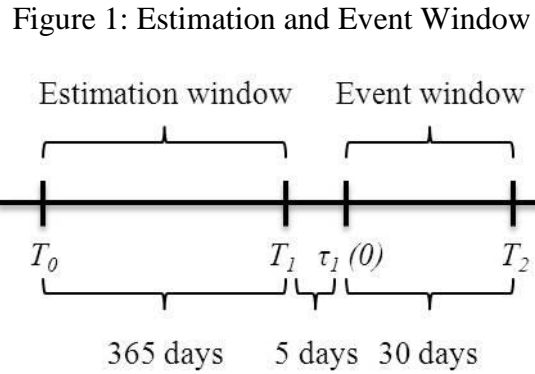
VII. 2. a) ii. Abnormal Returns

The abnormal return for a given firm at a given time is defined as the difference between the observed and the expected return:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}|X_t) \quad (2)$$

where $AR_{i,t}$ is the abnormal return of 'firm' i at time t, $R_{i,t}$ is the observed return for 'firm' i at time t, and X_t is the vector of independent variables that explain the expected, or 'normal', returns .

To calculate the abnormal returns following the repurchase announcements, in a first step a model needs to be defined that predicts the expected returns. In this thesis we utilize the market model for predicting short term expected returns. The accuracy of this model over a longer event window is highly debatable, however, over short event windows the model is adequate (Brown and Warner, 1985). The market model defines expected returns as:

$$E(R_{i,t}|X_t) = \hat{\alpha}_i + \hat{\beta}_i \times R_{M,t} \quad (3)$$

where $R_{M,t}$ is the market return at time t, and $\hat{\alpha}_i$ and $\hat{\beta}_i$ are the estimated values of running the following regressions:

$$R_{i,t} = \alpha_i + \beta_i \times R_{M,t} + \varepsilon_{i,t} \quad (4)$$

over the estimation period for each "firm" i. Furthermore, the estimated variance of the error terms $\hat{\sigma}_{\varepsilon,i}^2$ can be calculated from the residuals of the regression as follows:

$$\hat{\sigma}_{\varepsilon,i}^2 = \frac{1}{t_2 - t_1 - k} \sum_{t=t_1}^{t_2-1} AR_{i,t}^2 \quad (5)$$

where k is the number of coefficients that has to be estimated when calculating the abnormal returns.

Next, the cumulative abnormal returns and their variances are calculated for each 'firm' and averaged for each time period as:

$$\overline{CAR}_i(t_1, t_2) = \frac{1}{N} \sum_{i=1}^{N} \widehat{CAR}_i(t_1, t_2) \quad (6)$$

$$V(\overline{CAR}_i(t_1, t_2)) = \frac{(t_2 - t_1 + 1)}{N^2} \sum_{i=1}^{N} \hat{\sigma}_{\varepsilon,i}^2 \quad (7)$$

where $\widehat{CAR}_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{i,t}$, t_1 is the start of the event window, t_2 is the end of the event window, and N is the number of "firms". Furthermore, the ratio of the average cumulative abnormal return over the square root of the variance approaches the normal distribution.

VII. 2. b) Portfolio Developments

Having obtained all average abnormal returns for the companies included in the dataset, portfolios of firms were constructed according to their average investor horizons and market-to-book ratio. More specifically, they were grouped into quartiles with respect to their investor turnover and market-to-book ratio. These portfolios will consequently be compared and reconstructed so that new portfolios of value and growth stocks that are held by long-term and short-term investors, respectively, are developed. The development of the average cumulative abnormal returns of the portfolios will be compared and the ratio of:

$$\frac{\overline{CAR}_{lt}(t_1,t_2) - \overline{CAR}_{st}(t_1,t_2)}{\sqrt{V(\overline{CAR}_{lt}(t_1,t_2)) + V(\overline{CAR}_{st}(t_1,t_2))}} \quad (8)$$

will furthermore test the statistical significance of the difference in returns between the portfolios.

VII. 2. c) Regression

For the short-run regression analysis, the two-day cumulative abnormal returns will be evaluated. This is due to the fact that this period incorporates all significant abnormal returns, as can be seen in Figure 7 in the Appendix. First, a general regression of the cumulative abnormal returns on the investor turnover and the main control variables is conducted:

$CAR_{i,t} = IT_{i,t} + Size_{i,t} + MB_{i,t} + DE_{i,t} + LIQAS_{i,t} + STL_{i,t} + PaySize_{i,t} + InstOwn_{i,t} + InvConc_{i,t} + \varepsilon_{i,t}$ (9)

However, it is highly likely that abnormal returns for a given year or industry deviate from the average. Hence, both time-fixed effects and industry-fixed effects will be incorporated. Furthermore, the standard deviation is likely to be correlated within a given year and therefore, will be clustered accordingly.

To analyse the significance of investor turnover for value and growth stocks, the sample will be divided into market-to-book quartiles. The top and bottom quartile will represent the growth and value sub-samples, respectively.

To evaluate the robustness of the results, the sample will be divided into announcements that occurred before or in 2007 and announcements that occurred 2008 or later. The rationale is to check for variation in the results conditional on the market environment that the recent financial crisis entailed. For this analysis, standard errors will be

clustered over industries instead of years due to the fact that the expected correlation between standard errors within industries is greater than within years for the sub-sample.

VII.   3. Long-Run Analysis

As mentioned previously, the long- run analysis will conduct both a portfolio development and a regression analysis, too. The general method will be the same as in the short-run analysis with a few adjustments. Evidently, given the debatable values calculated by event studies over prolonged periods, the regression results should be seen as a source for discussion rather than empirical foundation.

Firstly, the event period will be three years following the repurchase announcements. This implies that the sample will be different since observations that occur within three years after a previous announcement will be dropped. This is conducted in order to avoid having duplicate event periods, i.e. so that the abnormal returns are not double-counted. Furthermore, a firm is assumed to have a contaminated estimation period if the previous announcement of the same firm was released within the last four years. The same adjustment for a contaminated estimation period as in the short-run analysis will be made. Finally, the last adjustment that needs to be made is a result of the iterated abnormal return calculation. The iterated process implies that any deviation in the actual expected returns and the predicted expected returns from a model will be compounded throughout the event period. Therefore, the Fama-French three factor model, which has a higher predictive power than the market model, will be utilized:

$$E\big(R_{i,t}|X_t\big) = \hat{\alpha}_i + \hat{\beta}_{i1} \times R_{M,t} + \hat{\beta}_{i2} \times R_{smb,t} + \hat{\beta}_{i3} \times R_{hml,t} \qquad (10)$$

VIII. Results

VIII. 1. Short-Run Analysis

VIII. 1. a) Portfolio Development

i.   Anticipation and Abnormal Returns

As can be seen in the scatter plots in Figures 7,8, and 9 in the Appendix, there are no substantially positive average abnormal returns prior to the announcement day. This holds for overall as well as for any of the value and growth stock sub-groups. Furthermore, the average abnormal returns are primarily negative during four days preceding the announcements. Hence, we find no evidence of information leakage and a subsequent anticipations of the events.

ii.   Cumulative Abnormal Returns

As can be seen in Figure 10 in the Appendix, all portfolios exhibit a positive cumulative abnormal return following the share repurchase announcements. As it is evident in Figures 7, 8, and 9 in the Appendix, which depict the daily abnormal returns, the initial jump in the abnormal returns lasts for two days. Figures 11 and 12 in the Appendix show that the abnormal returns are not only sustainable but also increasing over time for all portfolios except for the portfolio of growth stocks held by short-term investors. When comparing deviations in development for the different portfolios, the portfolio of growth stocks and the portfolio of all stocks held by long-term investor portfolios outperform the portfolio of value stocks and the portfolio of all stocks held by short-term investors over the period of thirty trading days.

Given that the portfolio of stocks held primarily by long-term investors outperforms the portfolio of stocks primarily held by short-term investors, it is potentially possible to surmise that the market values the implications of long-term investors. i.e. the perceived tendency of long-term investors to monitor corporate decisions and induce optimal behaviour seems to be incorporated by the market into the share prices.

As can be seen in Figure 11 in the Appendix, the portfolio of growth stocks that are held by long-term investors bears the highest cumulative abnormal return followed by the portfolio of value stocks that are held by long-term investors. While the portfolio of growth stocks that are held by short-term investors still leads to a sustainable cumulative abnormal return, the portfolio of value stocks that are held by short-term investors exhibits the lowest

cumulative abnormal return. Hence, both for the case of value stocks and for the case of growth stocks, stocks held by long-term investors outperform stocks held by short-term investors. As previously stated this is indicative of the market valuing the long-term investors' perceived monitoring capabilities.

VIII. 1. b) Regression Analysis

i.   General Regression

The general regression explaining the two-day abnormal returns indicates that the *investor turnover* has a positive effect on the cumulative abnormal returns (Table 3). That is, firms that are held primarily by short-term investors yield higher abnormal returns than firms that are held primarily by long-term investors. A positive relationship between the cumulative abnormal return and *investor turnover* implies that the market does not value the long-term investor's perceived monitoring capabilities to any greater extent, but rather short-term investor's value of share repurchases has a larger effect. However, the coefficient is statistically not significant. The only significant explanatory variable is the firm's *size*.

iii.   Incorporating Fixed-Effects

Incorporating industry-fixed and time-fixed effects increases the coefficient for the *investor turnover*, however, adjusting for time-clustered standard errors results in the coefficients being statistically less significant. Hence, there is no difference in interpretation from the general case.

iv.   Value Stocks Versus Growth Stocks

When analysing the explanatory power of *investor turnover* for the value stock sub-sample, the coefficient is marginally negative and statistically insignificant (Table 4). For this case firm *size* and *liquid assets* are the only significant explanatory variables. Although the result is slightly skewed towards the long-term investor's monitoring capabilities, the coefficient is negative, hence the result is negligible due to its size and significance. This indicates that neither long-term investor's perceived monitoring capabilities nor short-term investor's value in share repurchases have a dominant effect for value stocks.

In the case for the growth stock sub-sample, *investor turnover* has a negative effect on cumulative abnormal returns. However, the coefficient is still insignificant. Furthermore, the explanatory variables are statistically insignificant for this sub-sample. As was the case with value stocks, a negative relationship is indicative of the market valuing the perceived

monitoring capabilities of long-term investors, however the insignificance of the coefficient implies that no conclusive interpretation can be made.

v. Time Robust Analysis

The analysis of the impact of *investor turnover* on cumulative abnormal returns conditional on time period results in two different outcomes. For the period before and including 2007, the overall effect is positive while for the period of 2008 and later the overall effect is negative. In both scenarios the both coefficients are statistically insignificant (Table 5).

For the time-period prior to 2007, *investor turnover* in the sub-sample of value stocks has a positive but insignificant coefficient. However, for the same period in the sub-sample of growth stocks, the coefficient for *investor turnover* appears to be substantially negative and significant. For the time period following 2008, the coefficient for *investor turnover* in the sub-sample of value stocks is negative but insignificant. Finally, for the same time period in the sub-sample of growth stocks, *investor turnover* appears to be highly negative and statistically significant.

In summary, the inconclusive results are independent of the sample time period with the exception of growth stocks, which have statistically significant[3] and negative investor turnover coefficients in both sub-samples. This indicates that the market values the perceived monitoring capabilities of long-term investors for growth firms, which is in line with our first hypothesis.

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[3] The results become insignificant for the earlier time period if standard errors are clustered over years instead of industries.

IX.   2. Long-Run Analysis

IX.   2. a) Portfolio Development

When comparing the long-run development of the cumulative abnormal returns it is evident that there is a substantial difference in the results we obtain conditional on the portfolio composition. Firstly, we observe clear evidence that there is a significantly positive long-run cumulative abnormal return following the share repurchase announcement (Figure 17 in the Appendix), i.e. we find evidence that the market does not fully incorporate the total value of a repurchase announcement in the short-run – given the assumption of a correctly specified model for expected returns.

Deconstructing the cumulative abnormal returns by value stocks-, growth stocks-, long-term investor-, and short-term investor-based portfolios, we observe that the market's incorporation of information is restricted to certain firm types: Growth stocks and stocks that are primarily held by long-term investors Figure 14 in the Appendix. For value stocks and stocks primarily held by short-term investors, the figure does not depict any cumulative abnormal returns in the long-run. Hence, there is no evidence that the market does not incorporate the information correctly at the time of the announcement for these stocks. Furthermore, as can be seen in Figure 15, the long-term cumulative abnormal returns are significant for the portfolio of growth stocks and for the portfolio of stocks held by long-term investors. The results indicate that on average the value of having long-term investors is positive and significant, which implies they add value.

Finally, when further deconstructing the portfolios into investor horizons conditional on market-to-book ratios, it appears that all unincorporated information can be accounted for by growth stocks that are held primarily by long-term investors (Figure 13). Furthermore, as can be seen in Figure 16 in the Appendix, this is the only cumulative abnormal return that is statistically significantly different from zero. Hence, long-term investors provide value for a growth firm in the long-run. Furthermore, the value cannot be attributed to value stocks, which actually exhibit a higher abnormal return if they are held by short-term investors.

IX.   2. b) Regression Analysis

For the simple long-run regression (Table 8), we observe that the coefficients for the *size*, *market-to-book* ratio, *stock liquidity* and *institutional holdings* are significant. While for the *market-to-book* ratio the coefficient is positive, for *size*, *stock liquidity* and *institutional holdings* they appear to be negative. That is, the smaller the firms in terms of total assets are,

the higher are the returns following share repurchase announcements. This is in line with our expectations, since the degree of informational asymmetry should be relatively higher for these firms. Furthermore, within the scope of the simple regression, growth stocks exhibit higher average abnormal returns than value stocks following share repurchase announcements. Additionally, lower stock liquidity results in higher average abnormal returns, which is in agreement with the expectation that a share repurchase will result in added stock liquidity by increasing the depth on the buy-side of the market.

For the long-run regression including time- and industry fixed effects, the *size* coefficient becomes negative while we still observe that the coefficients for the *market-to-book* ratios, *stock liquidity* and *institutional holdings* are significant but small in magnitude. Furthermore, the *market-to-book* ratio the coefficient is positive, for *stock liquidity* and *institutional holdings* they still appear to be negative.

Finally, for the long-run regression including robustness control variables, we obtain significant coefficients for *payment size*, *institutional holdings* and *institutional investors concentration*, while for the *market-to-book* ratio and *stock liquidity* the coefficients become statistically insignificant. The market seems to assign a positive value to the potential monitoring of institutional investors which is expected to be higher the more concentrated the institutional holdings are.

To summarize the general explanatory power of *investor turnover* on the long-run cumulative abnormal return, the effect is not statistically significant. Hence, no conclusive interpretation can be made on the whole.

When the regression is run on the sub-samples of value and growth stocks (Table 7 in the Appendix) the investor turnover effect becomes positive and negative, respectively. In the case for value stocks the value is significant at the 10% level and for the case of growth stocks the value is significant at the 5% level. These results are in line with our hypotheses: the perceived monitoring effect from long-term investor yield relatively larger abnormal for growth stocks, while the effect is less significant for value stocks and only the value that short-term investors place on share repurchases becomes relevant for the abnormal return. Furthermore, these results transfer to the sub-sample of announcements prior to 2005 (Table 6), which exclude the noise from the recent crisis.

IX. Conclusion

In this thesis, we evaluate the effects of institutional shareholders' investment horizons on average abnormal returns of companies following share repurchase announcements between 2000 and 2010 conditional on market-to-book ratios. We expect that companies that are announcing share repurchases and are held primarily by long-term investors should *on average* exhibit higher average abnormal returns following repurchase announcements than companies that are announcing share repurchases and are held primarily by short-term investors. However, we posit that this effect will *vary conditional on market-to-book ratios*. A share repurchase should theoretically be value-reducing if it is an imperfect decision, i.e. in cases where better investment opportunities exist. Given the assumption that long-term investors are more inclined to monitor, the decision to repurchase shares by firms that are held by long-term investors should be more likely to be value-creating. Furthermore, companies should be more inclined to announce share repurchases when they perceive their current market price as potentially undervalued, which is more likely to be the case for low market-to-book (value) stocks and less likely to be the case for high market-to-book (growth) stocks. Hence, the value that the market assigns to the monitoring of corporate affairs should diminish for value stocks but be enhanced for growth stocks. Conditional on the lower monitoring value assigned to value stocks, investor horizons should for value stocks not affect the perceived value of a share repurchase. However, under the assumption that short-term investors prefer share repurchases over dividends, catering to these preferences should create a higher market reaction to a share repurchase announcement to a value stock that is primarily held by short-term investors.

Over the short-run, we find no conclusive evidence that investor horizon has an impact on cumulative abnormal returns following share repurchase announcements in general or in the case for value or growth stocks. Hence, over the short-run the market does not seem to assign a positive value to the potential monitoring administrated by long-term institutional investors or the catering of short-term institutional investors' preferences. Over the long-run, we find evidence that all sustainable abnormal returns following announced share repurchases can be attributed to a portfolio of growth stocks held by long-term institutional investors. Thus, the value generated by long-term investors, theoretically through the monitoring of corporate affairs, is realized in the long-run only in the case of growth stocks. Furthermore, our analysis indicates that long-term investors tend to have a negative effect on the long-run cumulative abnormal returns following share repurchase announcements for value stocks.

A motivation for further research that emerges from our thesis would be the robustness of our analysis when being subject to a more elaborate expected return model, which might possess more explanatory power with regard to the exhibited cumulative abnormal returns over the long-run, or the analysis' robustness in different markets and/ or market conditions.

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Appendix

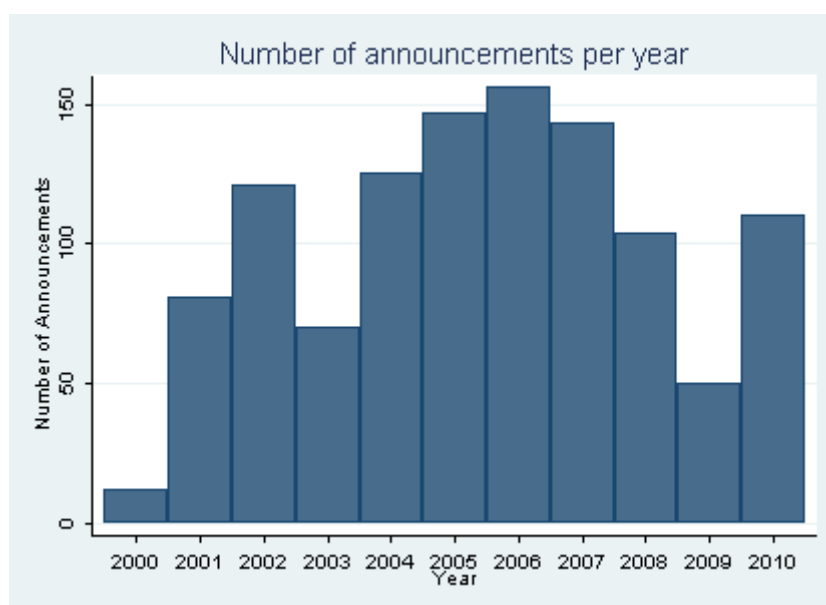Figure 2: Number of Share Repurchase Announcements per Year

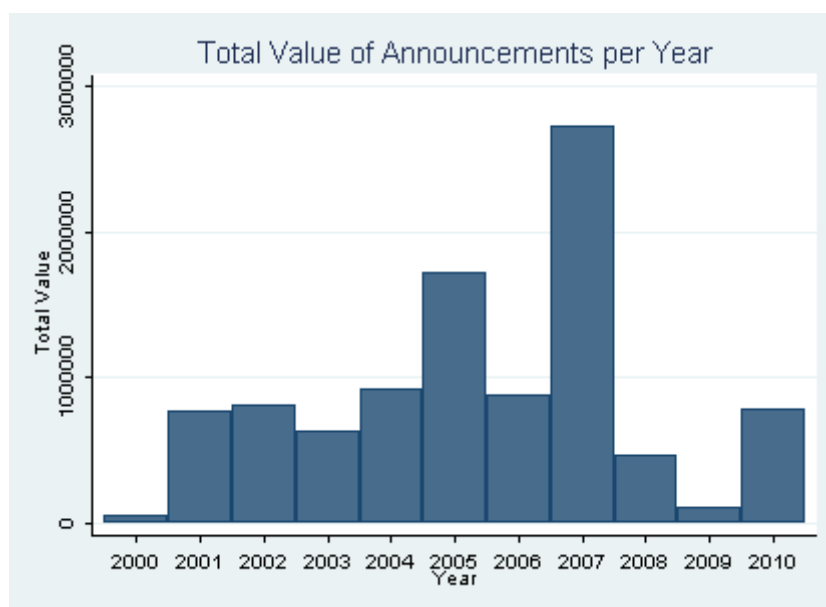Figure 3: Total Value of Share Repurchase Announcements per Year in US Dollar (Thousand)

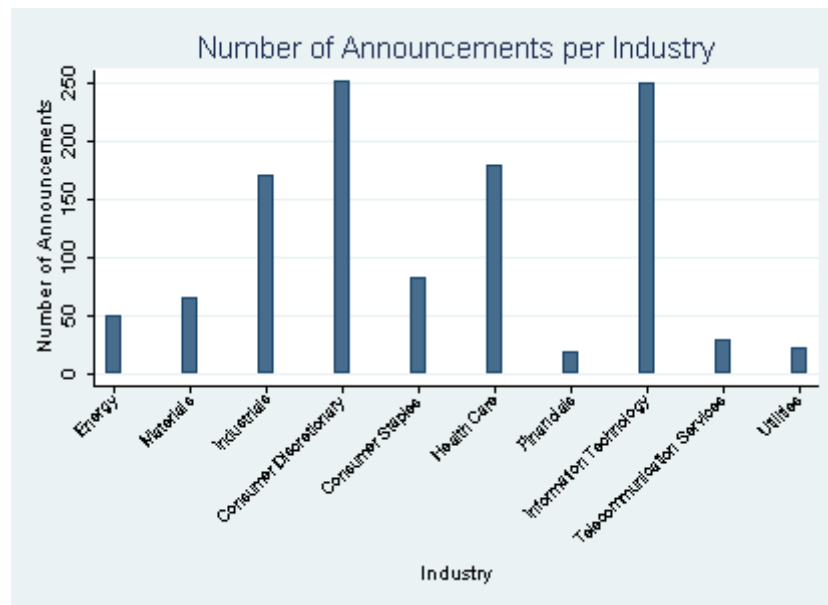Figure 4: Number of Share Repurchase Announcements per Industry

Figure 5: Average Percentage of Total Outstanding Shares Announced for Repurchase per Industry
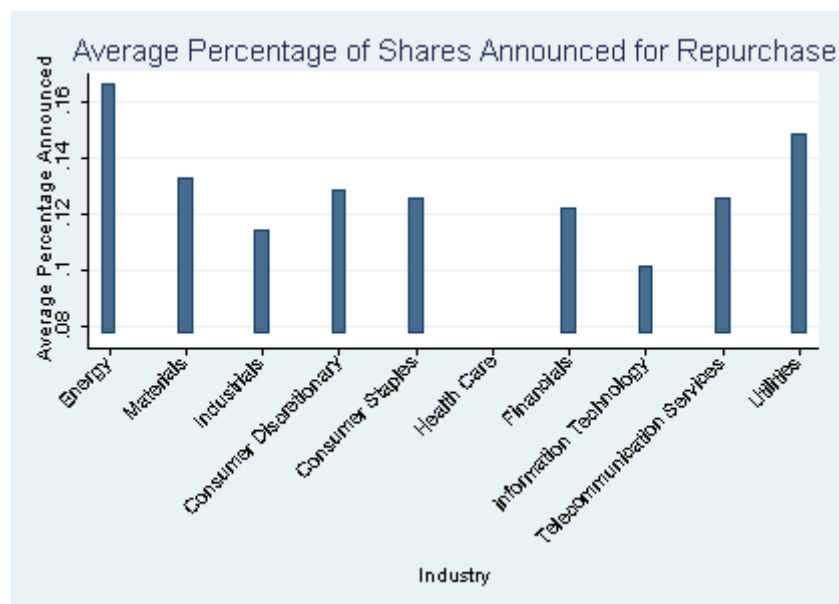
Figure 6: Total Value of Share Repurchase Announcements per Industry in US Dollars
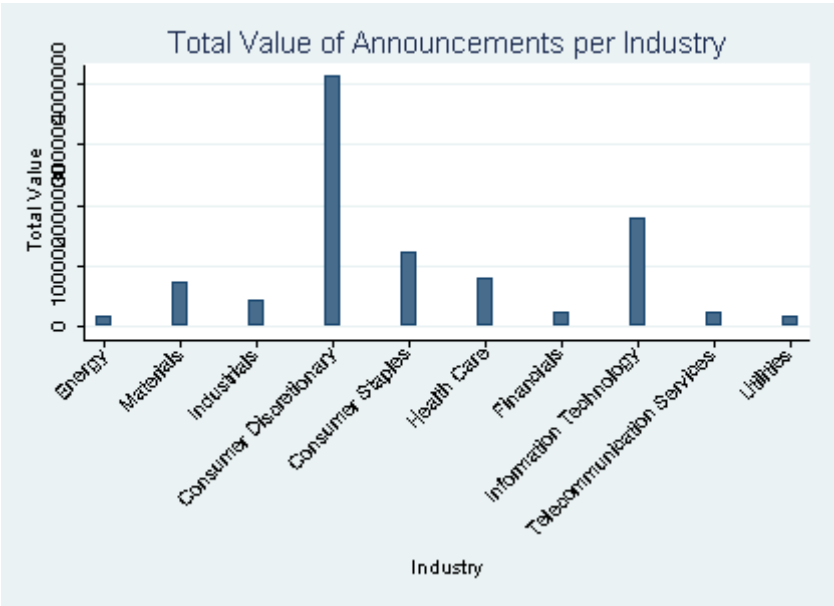(Thousand)

Table 1: Summary Statistics of All Observations

All Observations

Statistics	CAR	IT	Size	M/B	D/E	Liquid Assets	Stock Liquidity	Investor Concentration	Payout Ratio	Institutional Holdings	Manager Holdings	Equity Compensation	Analyst Estimates
Number	1119	1119	1119	1119	1119	1119	1119	1119	1119	1119	221	221	1053
Mean	0.02	0.29	6.78	3.50	0.33	0.27	2350778.00	-13.53	0.11	18.29	2.87	0.37	124.15
Median	0.01	0.29	6.61	2.65	0.18	0.23	1790495.00	-13.30	0.00	11.87	0.83	0.33	106.00
Standard Deviation	0.09	0.07	2.08	9.52	1.90	0.23	2193946.00	5.29	0.29	26.81	5.51	0.32	90.94

Value Stocks

Statistics	CAR	IT	Size	M/B	D/E	Liquid Assets	Stock Liquidity	Investor Concentration	Payout Ratio	Institutional Holdings
Number	244	244	244	244	244	244	244	244	244	244
Mean	0.02	0.28	6.62	-1.80	-0.15	0.22	1837525.00	-11.86	0.16	20.49
Median	0.02	0.28	6.37	1.20	0.26	0.16	1378109.00	-11.33	0.00	10.40
Standard Deviation	0.08	0.09	2.22	15.02	3.67	0.24	2466233.00	5.61	0.34	44.87

Growth Stocks

Statistics	CAR	IT	Size	M/B	D/E	Liquid Assets	Stock Liquidity	Investor Concentration	Payout Ratio	Institutional Holdings
Number	309	309	309	309	309	309	309	309	309	309
Mean	0.03	0.30	6.64	9.29	0.54	0.32	2873200.00	-14.31	0.10	18.55
Median	0.02	0.29	6.52	6.44	0.09	0.28	1984879.00	-14.16	0.00	11.88
Standard Deviation	0.11	0.06	2.15	9.62	1.22	0.25	2619036.00	5.49	0.29	19.50

Before 2008

Statistics	CAR	IT	Size	M/B	D/E	Liquid Assets	Stock Liquidity	Investor Concentration	Payout Ratio	Institutional Holdings
Number	855	855	855	855	855	855	855	855	855	855
Mean	0.02	0.30	6.70	3.81	0.36	0.28	2265375.00	-13.48	0.13	17.88
Median	0.01	0.29	6.53	2.73	0.17	0.23	1651061.00	-13.44	0.00	11.86
Standard Deviation	0.09	0.07	2.09	9.16	1.09	0.24	2272864.00	5.35	0.30	27.11

After 2007

Statistics	CAR	IT	Size	M/B	D/E	Liquid Assets	Stock Liquidity	Investor Concentration	Payout Ratio	Institutional Holdings
Number	264.00	264.00	264.00	264.00	264.00	264.00	264.00	264.00	264.00	264.00
Mean	0.02	0.28	7.07	2.52	0.23	0.25	2627369.00	-13.68	0.08	19.59
Median	0.02	0.26	6.81	2.43	0.25	0.19	2227798.00	-12.98	0.00	12.00
Standard Deviation	0.09	0.07	2.06	10.54	3.39	0.22	1893815.00	5.08	0.24	25.84

Table 2: Short-Run Regression Statistics for Sub-Groups by Time-Periods

VARIABLES	(1) Before 2008	(2) After 2007
Investor Turnover	0.0801	-0.0988
	(0.105)	(0.137)
Size	-0.00547*	0.00431
	(0.00258)	(0.00267)
MB	1.04e-05	-0.000378
	(0.000561)	(0.000284)
DE	0.000805	0.000166
	(0.00402)	(0.000448)
Liquid Assets	-0.0158	0.00361
	(0.0247)	(0.0400)
Stock Liquidity	-3.31e-10	3.82e-09
	(1.85e-09)	(3.85e-09)
Payout Ratio	0.00810	-0.00647
	(0.0160)	(0.0163)
Institutional Holdings	-0.000177**	6.59e-05
	(6.16e-05)	(9.86e-05)
Investor Concentration	-0.000174	0.00362**
	(0.000718)	(0.00128)
Constant	0.0965*	0.0510
	(0.0526)	(0.0567)
Observations	855	264
R-squared	0.079	0.093

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: General Short-Run Regression Statistics

VARIABLES	(1) Simple	(2) Fixed Effects	(3) Robust
Investor Turnover	0.0425	0.0494	0.141
	(0.0392)	(0.0980)	(0.101)
Size	-0.00453**	-0.00333	-0.00206
	(0.00181)	(0.00208)	(0.00539)
MB	0.000180	-3.11e-05	0.00190*
	(0.000304)	(0.000252)	(0.000771)
DE	-0.000353	0.000155	-0.0109*
	(0.00152)	(0.000525)	(0.00528)
Liquid Assets	-0.00926	-0.0118	0.00640
	(0.0139)	(0.0121)	(0.0410)
Stock Liquidity	5.77e-10	4.76e-10	3.26e-09
	(1.29e-09)	(1.39e-09)	(1.80e-09)
Payout Ratio	0.00838	0.00426	0.0265**
	(0.00961)	(0.00706)	(0.00713)
Institutional Holdings	-0.000153	-0.000109	-0.000131
	(0.000101)	(6.65e-05)	(0.000129)
Investor Concentration	0.000835	0.000635	0.00199**
	(0.000604)	(0.000793)	(0.000768)
Manager Holdings			0.00180***
			(0.000404)
Equity Compensation			-0.0138
			(0.0139)
Number of Analysts			8.29e-05
			(9.97e-05)
Constant	0.0544***	0.0982***	-0.0142
	(0.0182)	(0.0196)	(0.0647)
Observations	1,119	1,119	221
R-squared	0.024	0.065	0.201

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Short-Run Regression Statistics for Portfolios of Growth and Value Stocks

VARIABLES	(1) Value Stocks	(2) Growth Stocks
Investor Turnover	-0.00834	-0.295
	(0.157)	(0.168)
Size	-0.0110***	-0.00332
	(0.00328)	(0.00330)
MB	0.000303	-0.000359
	(0.000217)	(0.000733)
DE	0.000563	0.00289
	(0.000681)	(0.00619)
Liquid Assets	-0.0790**	0.00161
	(0.0274)	(0.0371)
Stock Liquidity	-8.55e-10	4.48e-09
	(1.77e-09)	(3.01e-09)
Payout Ratio	-0.00431	0.0111
	(0.0156)	(0.0289)
Institutional Holdings	-0.000108*	-0.000331
	(5.58e-05)	(0.000405)
Investor Concentration	0.000155	-8.09e-05
	(0.00173)	(0.00136)
Constant	0.210***	0.173**
	(0.0257)	(0.0729)
Observations	244	309
R-squared	0.234	0.115

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 5: Short-Run Regression Statistics for Time-Dependent Differences

VARIABLES	(1) Value Stocks Before 2008	(2) Growth Stocks Before 2008	(3) Value Stocks After 2007	(4) Growth Stocks After 2007
Investor Turnover	0.0322	-0.220**	-0.152	-0.474**
	(0.137)	(0.0925)	(0.237)	(0.198)
Size	-0.0114*	-0.00456***	-0.00554	0.00323
	(0.00528)	(0.00134)	(0.00475)	(0.0114)
MB	0.000476	-0.000166	2.43e-06	-0.00951
	(0.000270)	(0.00105)	(0.000200)	(0.00581)
DE	0.00126	0.00461	0.000533	-0.00171
	(0.00295)	(0.00876)	(0.000458)	(0.00914)
Liquid Assets	-0.0863***	0.0214	-0.0564	-0.120
	(0.0257)	(0.0407)	(0.0347)	(0.0913)
Stock Liquidity	-5.74e-10	1.99e-09	-7.55e-09	2.76e-08***
	(2.17e-09)	(3.97e-09)	(9.92e-09)	(7.99e-09)
Payout Ratio	0.0148	0.00645	-0.0388	0.0940**
	(0.00924)	(0.0566)	(0.0302)	(0.0338)
Institutional Holdings	-0.000173***	-0.000333	6.81e-05	-0.000795
	(4.65e-05)	(0.000264)	(0.000174)	(0.000494)
Investor Concentration	-0.000700	-0.000573	0.00226	0.00260
	(0.00144)	(0.000546)	(0.00323)	(0.00297)
Constant	0.201***	0.153	0.166	0.164*
	(0.0425)	(0.182)	(0.112)	(0.0857)
Observations	176	254	68	55
R-squared	0.290	0.108	0.260	0.517

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Long-Run Regression Statistics for Announcements Prior to 2005

VARIABLES	(1) General	(2) Value Stocks	(3) Growth Stocks
Investor Turnover	1.588	4.821**	-8.848*
	(1.954)	(1.668)	(4.081)
Size	-0.104	0.0532	-0.195**
	(0.0810)	(0.196)	(0.0737)
MB	0.0318**	0.00775	0.0157
	(0.0129)	(0.0137)	(0.0293)
DE	0.129	0.137	-0.0140
	(0.102)	(0.187)	(0.0716)
Liquid Assets	0.825	0.900	0.748
	(0.703)	(1.616)	(0.479)
Stock Liquidity	-1.84e-07***	-2.48e-07***	-1.10e-07*
	(4.75e-08)	(3.64e-08)	(5.24e-08)
Payout Ratio	-0.213	-0.493	-0.696*
	(0.544)	(0.512)	(0.347)
Institutional Holdings	-0.0180**	0.000158	-0.0184*
	(0.00579)	(0.00749)	(0.00947)
Investor Concentration	0.0332	0.0129	0.0388
	(0.0492)	(0.0562)	(0.0293)
Constant	4.659***	1.868	11.78***
	(1.169)	(1.904)	(1.978)
Observations	276	110	162
R-squared	0.268	0.365	0.411

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 7: Long-Run Regression Statistics for for Portfolios of Growth and Value Stocks

VARIABLES	(1) Value Stocks	(2) Growth Stocks
Investor Turnover	4.898*	-9.398**
	(2.181)	(3.897)
Size	0.0425	-0.189***
	(0.120)	(0.0490)
MB	0.00820	0.0169
	(0.0144)	(0.0239)
DE	0.132	-0.0196
	(0.160)	(0.117)
Liquid Assets	0.906	0.713
	(1.749)	(0.616)
Stock Liquidity	-2.50e-07***	-8.50e-08
	(5.19e-08)	(5.57e-08)
Payout Ratio	-0.513	-0.705***
	(0.629)	(0.196)
Institutional Holdings	0.00122	-0.0191*
	(0.00663)	(0.00956)
Investor Concentration	0.0121	0.0436
	(0.0367)	(0.0275)
Constant	1.847	11.82***
	(1.022)	(1.494)
Observations	113	174
R-squared	0.363	0.409

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 8: General Long-Run Regression Results

VARIABLES	(1) simple	(2) Fixed Effects	(3) Robust
Investor Turnover	0.287	1.272	-0.880
	(1.038)	(0.931)	(3.219)
Size	-0.101*	-0.0814	-0.206
	(0.0528)	(0.0580)	(0.130)
MB	0.0326***	0.0259*	0.0229
	(0.0119)	(0.0114)	(0.0472)
DE	0.0587	0.0842	0.128
	(0.0770)	(0.0824)	(0.277)
Liquid Assets	0.373	0.442	0.307
	(0.394)	(0.474)	(1.028)
Stock Liquidity	-1.43e-07***	-1.42e-07**	4.27e-09
	(3.11e-08)	(4.82e-08)	(5.64e-08)
Payout Ratio	-0.135	-0.184	-0.781**
	(0.0876)	(0.105)	(0.283)
Institutional Holdings	-0.01000**	-0.00862*	-0.0123**
	(0.00428)	(0.00453)	(0.00368)
Investor Concentration	0.0232	0.0190	0.0626***
	(0.0176)	(0.0117)	(0.0151)
Manager Holdings			-0.0194
			(0.0148)
Equity Compensation			-0.788
			(0.459)
Number of Analysts			0.00314
			(0.00212)
Constant	1.419***	4.453***	3.300*
	(0.477)	(0.655)	(1.516)
Observations	551	551	136
R-squared	0.102	0.178	0.293

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

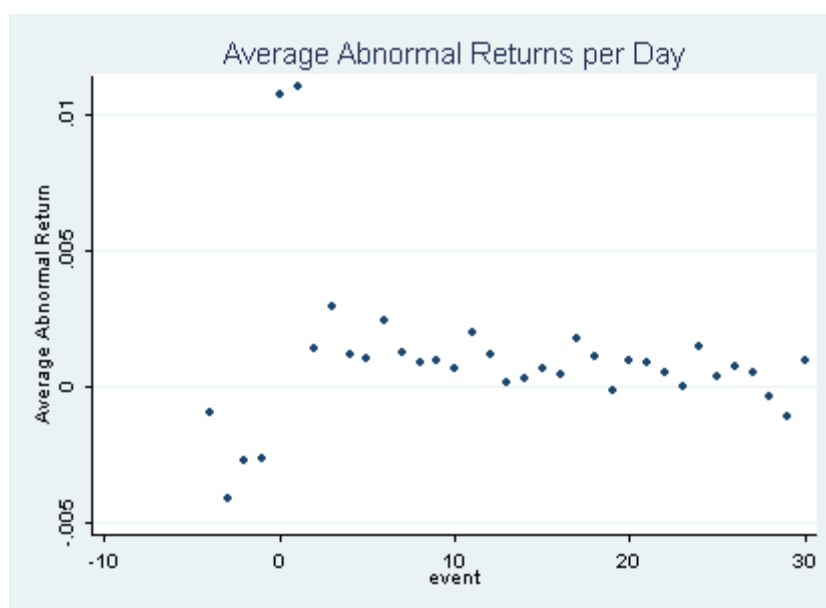Figure 7: Overall Average Abnormal Returns per Day (Short-Run)

Figure 8: Average Abnormal Returns for Investor Horizon Sub-Groups Conditional on Market-to-Book Ratios (Short-Run)
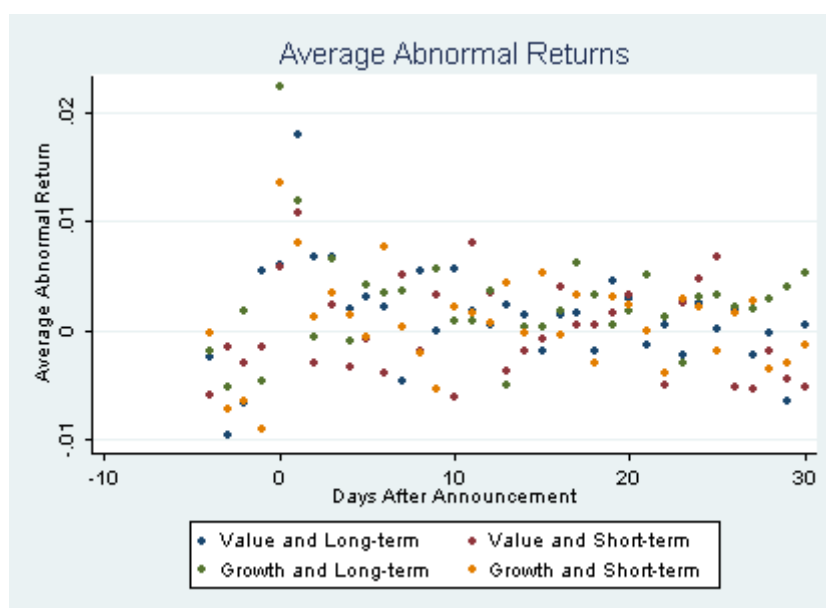
Figure 9: Average Abnormal Returns for Market-to-Book and Investor Horizon Sub-Groups
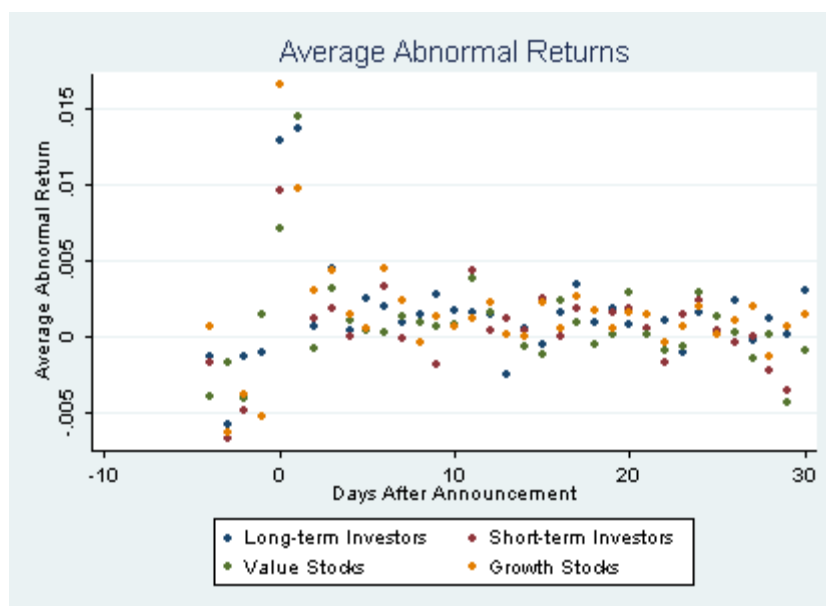(Short-Run)

Figure 10: Average Cumulative Abnormal Returns Following Share Repurchase
Announcements for All Observations (Short-Run)

Figure 11: Average Cumulative Abnormal Returns for Investor Horizon Sub-Groups
Conditional on Market-to-Book Ratios (Short-Run)

Figure 12: Average Cumulative Abnormal Returns for Market-to-Book and Investor Horizon
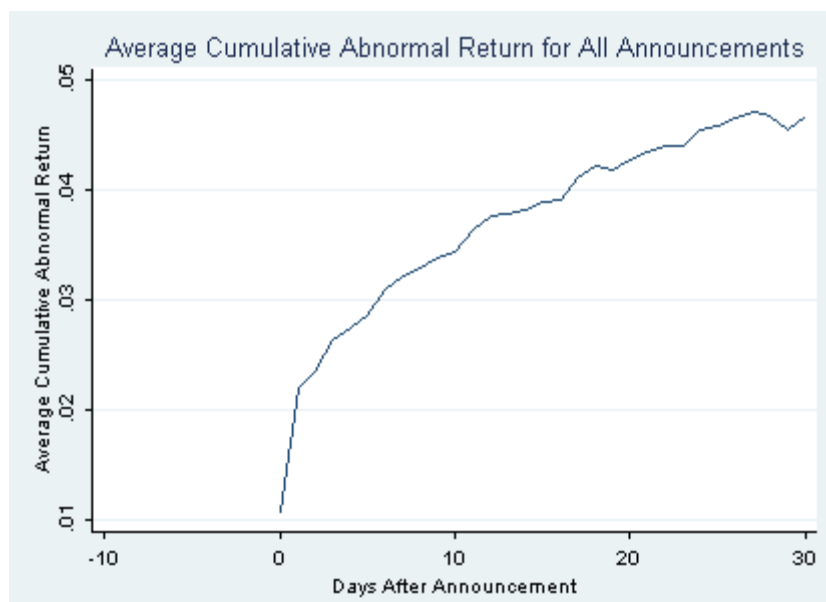Sub-Groups (Short-Run)

Figure 13: Average Cumulative Abnormal Returns for Investor Horizon Sub-Groups
Conditional on Market-to-Book Ratios (Long-Run)
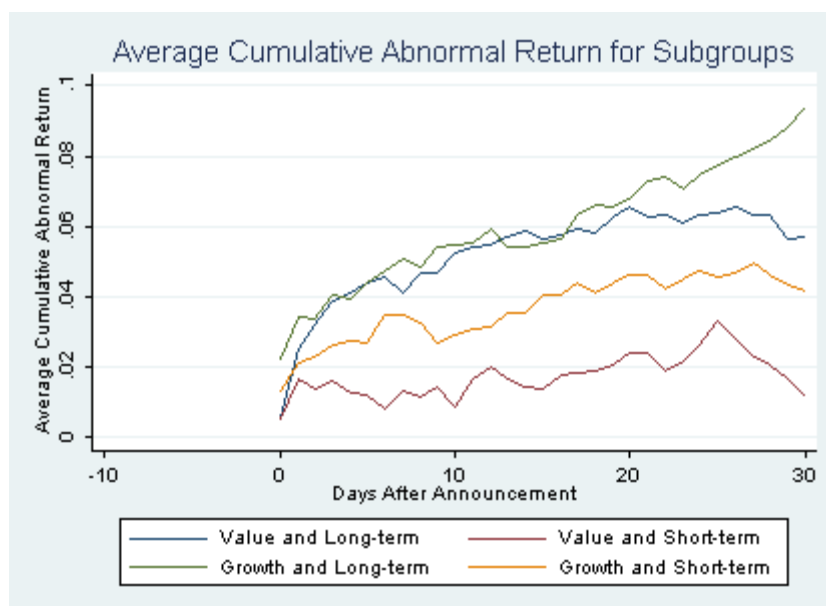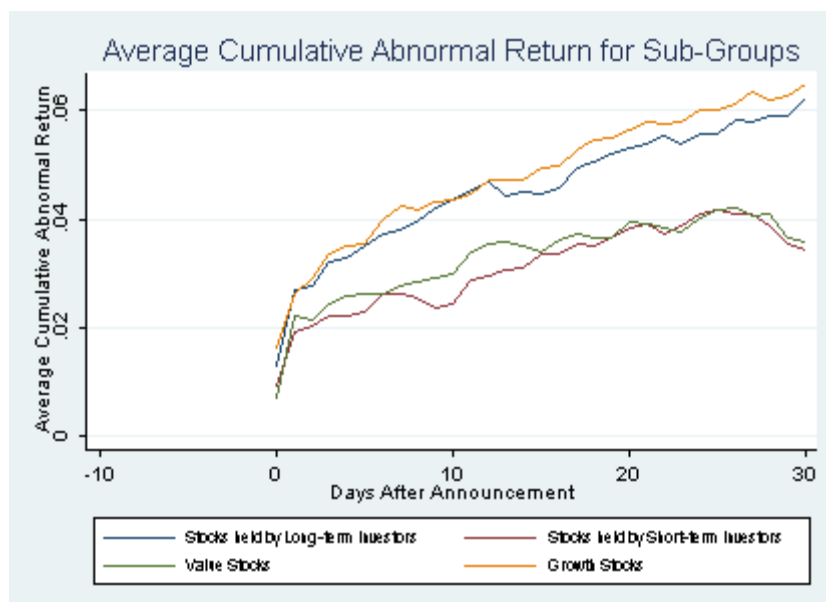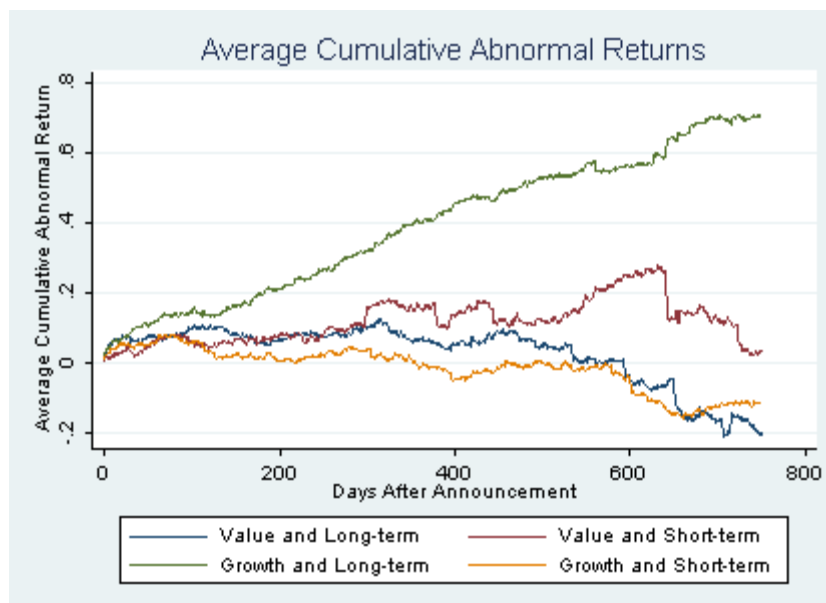

Figure 14: Average Cumulative Abnormal Returns for Market-to-Book and Investor Horizon
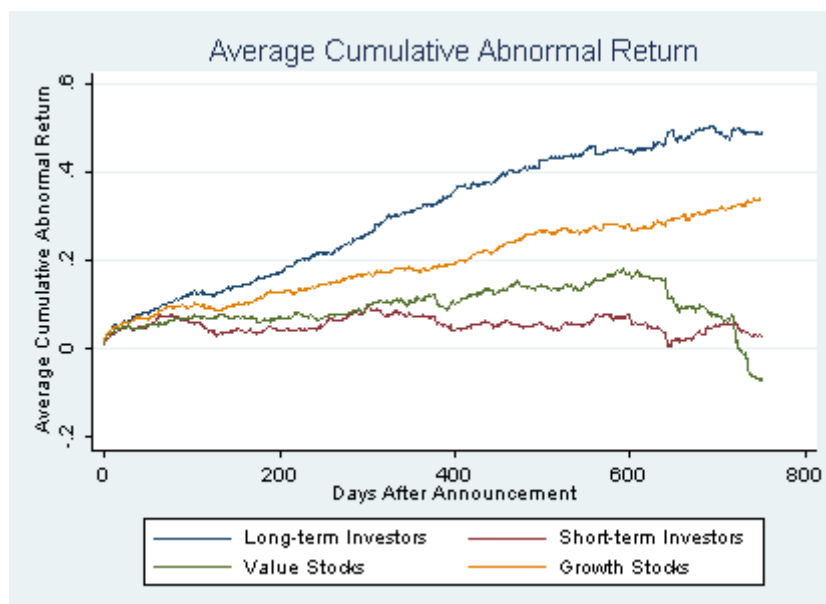Sub-Groups (Long-Run)

Figure 15: T-Statistics for Market-to-Book and Investor Horizon Sub-Groups
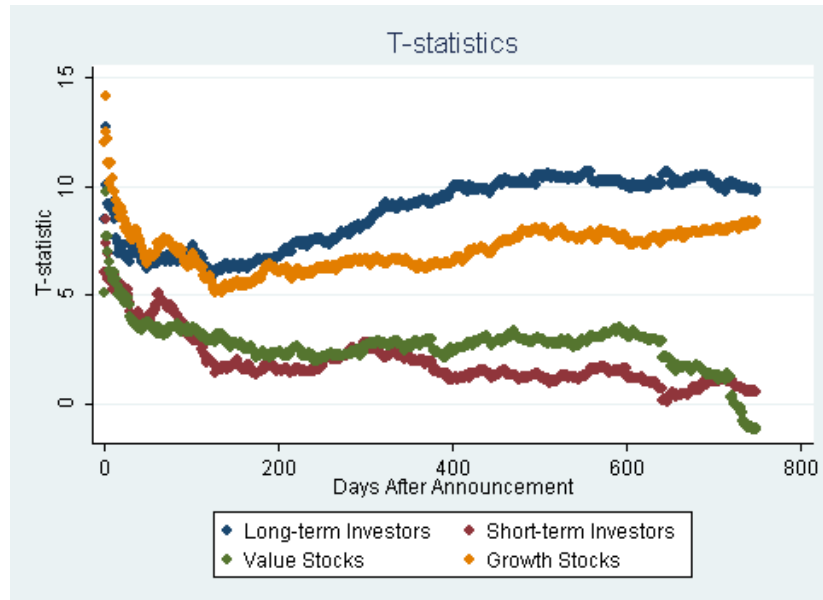

Figur 16: T-Statistics for Investor Horizon Sub-Groups Conditional on Market-to-Book Ratios
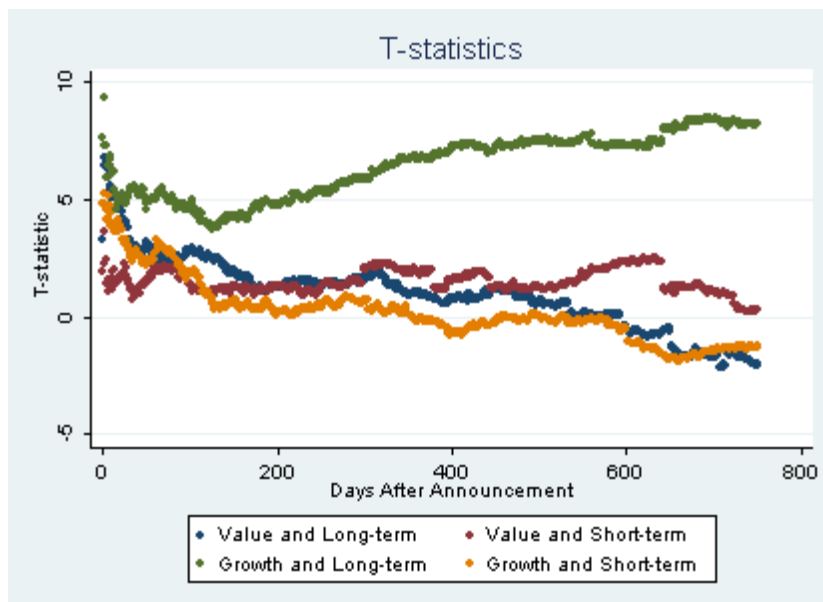
Table 9: MulticollinearityAnalysis

VARIABLES	(1) General	(2) fixed effects	(3) robust
Size	-0.000651	-0.000236	-0.00483
	(0.00137)	(0.00132)	(0.00317)
MB	6.47e-06	9.19e-05	-0.000856
	(0.000232)	(0.000225)	(0.000591)
DE	-0.000169	-0.000815	0.00859*
	(0.00116)	(0.00112)	(0.00508)
Liquid Assets	0.00369	0.000225	-0.0411**
	(0.0105)	(0.0102)	(0.0172)
Stock Liquidity	7.67e-09***	7.65e-09***	5.57e-09***
	(9.52e-10)	(9.23e-10)	(1.45e-09)
Investor Concentration	0.000781*	0.000919**	-0.000653
	(0.000456)	(0.000439)	(0.000725)
Repurchase Percentage	-0.0194***	-0.0181***	-0.0131
	(0.00721)	(0.00699)	(0.0117)
Institutional Holdings	-0.000160**	-0.000135*	-0.000158
	(7.58e-05)	(7.32e-05)	(0.000116)
Management Holdings			-0.000506
			(0.000549)
Equity Compensation			0.000255
			(0.00999)
Number of Analysts			-4.16e-05
			(5.18e-05)
Constant	0.294***	0.215***	0.334***
	(0.0106)	(0.0215)	(0.0222)
Observations	1,150	1,150	232
R-squared	0.071	0.166	0.126

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Cumulative Abnormal Returns

All	Value	Growth	Long-term	Short-term	Value and long-term	Value and short-term	Growth and long-term	Growth and short-term
1.08%	0.70%	1.65%	1.29%	0.95%	0.60%	0.54%	2.23%	1.35%
2.19%	2.21%	2.62%	2.70%	1.92%	2.52%	1.68%	3.45%	2.15%
2.34%	2.14%	2.92%	2.76%	2.04%	3.21%	1.39%	3.38%	2.28%
2.63%	2.45%	3.35%	3.22%	2.23%	3.88%	1.63%	4.04%	2.62%
2.75%	2.58%	3.49%	3.28%	2.24%	4.12%	1.30%	3.96%	2.77%
2.85%	2.61%	3.55%	3.51%	2.29%	4.38%	1.22%	4.38%	2.71%
3.08%	2.63%	3.99%	3.71%	2.62%	4.59%	0.82%	4.73%	3.48%
3.21%	2.77%	4.23%	3.81%	2.62%	4.14%	1.34%	5.08%	3.51%
3.29%	2.86%	4.17%	3.93%	2.55%	4.67%	1.15%	4.85%	3.24%
3.39%	2.93%	4.31%	4.22%	2.36%	4.68%	1.47%	5.40%	2.69%
3.44%	3.01%	4.36%	4.36%	2.45%	5.25%	0.86%	5.47%	2.92%
3.63%	3.39%	4.46%	4.52%	2.88%	5.43%	1.67%	5.53%	3.07%
3.77%	3.54%	4.72%	4.68%	2.95%	5.46%	2.01%	5.96%	3.14%
3.78%	3.56%	4.72%	4.43%	3.07%	5.69%	1.65%	5.43%	3.57%
3.81%	3.51%	4.72%	4.48%	3.12%	5.85%	1.47%	5.45%	3.57%
3.88%	3.38%	4.95%	4.45%	3.36%	5.65%	1.41%	5.53%	4.08%
3.92%	3.62%	4.99%	4.58%	3.37%	5.79%	1.81%	5.64%	4.06%
4.10%	3.71%	5.27%	4.93%	3.55%	5.95%	1.86%	6.31%	4.38%
4.22%	3.66%	5.45%	5.05%	3.51%	5.79%	1.92%	6.64%	4.09%
4.18%	3.66%	5.47%	5.19%	3.66%	6.24%	2.09%	6.56%	4.39%
4.28%	3.95%	5.64%	5.29%	3.85%	6.53%	2.41%	6.79%	4.62%
4.35%	3.91%	5.77%	5.38%	3.90%	6.26%	2.41%	7.27%	4.61%
4.40%	3.82%	5.74%	5.51%	3.73%	6.31%	1.92%	7.41%	4.24%
4.40%	3.75%	5.80%	5.40%	3.88%	6.09%	2.18%	7.09%	4.52%
4.55%	4.04%	6.01%	5.56%	4.11%	6.34%	2.65%	7.44%	4.73%
4.59%	4.18%	6.02%	5.58%	4.15%	6.36%	3.32%	7.75%	4.55%
4.65%	4.21%	6.12%	5.80%	4.11%	6.54%	2.82%	7.95%	4.70%
4.71%	4.07%	6.34%	5.78%	4.10%	6.32%	2.28%	8.17%	4.97%
4.67%	4.10%	6.20%	5.90%	3.88%	6.32%	2.09%	8.43%	4.62%
4.55%	3.66%	6.26%	5.91%	3.53%	5.66%	1.66%	8.83%	4.33%
4.67%	3.56%	6.47%	6.22%	3.44%	5.69%	1.14%	9.38%	4.19%

T-stats

All	Value	Growth	Long-term	Short-term	Value and long-term	Value and short-term	Growth and long-term	Growth and short-term
15.56	4.40	13.81	8.79	6.45	2.25	1.48	8.29	5.67
22.44	9.80	15.52	13.02	9.27	6.64	3.27	9.07	6.39
19.55	7.75	14.10	10.88	8.04	6.90	2.21	7.27	5.54
19.03	7.68	14.03	10.97	7.60	7.23	2.24	7.53	5.51
17.78	7.21	13.06	9.99	6.81	6.86	1.60	6.59	5.21
16.83	6.67	12.14	9.79	6.36	6.67	1.37	6.65	4.65
16.85	6.24	12.61	9.56	6.75	6.47	0.85	6.65	5.53
16.43	6.13	12.53	9.18	6.30	5.46	1.30	6.69	5.22
15.84	5.97	11.64	8.94	5.79	5.81	1.06	6.01	4.54
15.50	5.79	11.40	9.10	5.09	5.51	1.28	6.36	3.59
14.99	5.69	11.00	8.97	5.03	5.90	0.71	6.13	3.70
15.17	6.13	10.78	8.91	5.67	5.84	1.33	5.94	3.73
15.13	6.15	10.96	8.86	5.58	5.64	1.54	6.15	3.66
14.62	5.97	10.56	8.07	5.59	5.67	1.21	5.40	4.01
14.23	5.67	10.19	7.90	5.48	5.63	1.05	5.23	3.88
14.04	5.30	10.35	7.59	5.72	5.27	0.97	5.15	4.29
13.74	5.50	10.14	7.57	5.57	5.23	1.21	5.09	4.14
13.98	5.48	10.41	7.93	5.70	5.22	1.20	5.54	4.34
13.99	5.26	10.46	7.91	5.48	4.95	1.21	5.67	3.95
13.52	5.13	10.24	7.91	5.58	5.20	1.28	5.46	4.13
13.50	5.40	10.29	7.88	5.72	5.31	1.45	5.52	4.24
13.42	5.23	10.29	7.83	5.66	4.97	1.42	5.77	4.14
13.28	4.99	10.03	7.84	5.30	4.90	1.10	5.75	3.72
13.00	4.80	9.91	7.52	5.39	4.63	1.22	5.38	3.88
13.16	5.06	10.06	7.59	5.60	4.73	1.46	5.53	3.98
13.02	5.13	9.88	7.47	5.54	4.65	1.79	5.66	3.75
12.95	5.07	9.87	7.62	5.38	4.69	1.49	5.70	3.81
12.87	4.82	10.03	7.45	5.28	4.45	1.18	5.75	3.96
12.54	4.77	9.64	7.48	4.90	4.37	1.07	5.83	3.61
12.02	4.19	9.57	7.36	4.38	3.85	0.83	6.00	3.33
12.13	4.01	9.72	7.62	4.20	3.81	0.56	6.27	3.17