Do myopic firm owners trade off payouts for investment? Evidence from share buyback reform

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Abstract

Following the 1982 share repurchase liberalization in the US, firms with greater short-termist ownership increase payouts by 1% of total assets. This is entirely driven by share repurchases and reduced equity issuance while dividends do not fall after the event. These results soundly reject perfect substitutability of dividends and share repurchases. The increase in payouts is mirrored by an equally sized decline in investment, showing that share repurchase liberalization has sizable real effects on firm behavior. Tests exploiting insider trading behavior strongly suggest that the results are driven by myopic considerations, rather than efficient down-sizing of firms following the reform.

1 Introduction

In this paper, I study the effects of share buyback liberalization in the United States in 1982 on corporate policies, notably payout and investment choices. In a frictionless Modigliani and Miller (1958) setting, dividends and share repurchases are equivalent means of paying out cash to shareholders while there is a strict dichotomy between payout and investment policies so that investment decisions, in theory, should not be affected. On the other hand, theories of corporate myopia predict that there can be a trade-off between payouts and investment in the presence of information imperfections, where firms use payouts to signal about their investment prospects. These trade-offs are particularly prevalent at firms that have higher ownership by short-term

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investors, who turn over their shares relatively quickly. They face the strongest incentives to engage in inefficient trade-offs of short-term gains at longer-run costs.

The empirical test I design discriminates between these two views of share buyback reform. Splitting US public firms by their share of short-termist institutional owners in the pre-reform period, I estimate in a differences-in-differences setting how firms' payout and investment decisions vary when previously heavily restricted share repurchases are greatly liberalized in 1982. I find that firms with greater ex-ante short-termist ownership increase payouts by 1.24 percent of total assets while reducing investment by 1.0-1.1 percent of total assets. These effects are large since yearly gross investment at the average firm amounts to 8.1 percent of total assets. Moreover, the results clearly indicate the presence of an investment-payout trade-off at firms with higher short-termist ownership.

Two lines of argument can reconcile these empirical results with theory. One is the myopia interpretation: Firms inefficiently cut back on investment to increase payouts due to short-termist pressures originating from their owners having short holding horizons. Alternatively, firms could also be efficiently sizing down. In particular, those firms with high short-termist ownership could have been over-investing in the pre-reform period or hoarding large cash balances. Following the reform, those funds would be paid out to shareholders instead of being inefficiently invested in negative net present value projects.

In order to distinguish these two arguments, I test how insider trading behavior reacts to higher short-termist ownership, the logic being as follows: If the myopia view is the dominant one, prospects for the firm worsen when short-termist ownership rises since investment will be reduced too much. Hence, insiders have an incentive to sell their shares in the firm. In contrast, if the dominant view is the efficient downsizing argument, the higher presence of short-termist owners if anything improves the prospects of the firm as those short-termists push towards cutting inefficient over-investment. Consequently, insiders have incentives to maintain their holdings in the firm or increase them.

Using a merged dataset of newly digitized insider trading data for the pre-1986 period and existing data since 1986, which captures the universe of trades by corporate insiders, I test whether higher short-termist ownership is related to insider sales. In an estimated logit model, high short-termist ownership predicts sales by corporate insiders in the post-reform period but not prior to the reform. For a formal test, I collapse the insider trading data at the firm-level and estimate a differences-in-differences specification with insider trades as dependent variable. After the 1982 share repurchase liberalization, firms with high pre-reform short-termist ownership have a significantly higher fraction of insider sales over total insider trades than firms that started from low short-termist ownership. These results are consistent with the myopia view but harder to reconcile with efficient downsizing.

Building on these firm-level results, I further ask whether industry-level general equilibrium effects partially offset the firm-level forces. Since some firms reduce their investment myopically, other firms in the same industry might increase their investment and seize an opportunity to

expand. I adapt recent advances in the estimation of regional general equilibrium multipliers (Mian et al., 2019) to a corporate finance setting. Rather than comparing household-level and regional-level multipliers, I compare firm-level and industry-level multipliers. This exercise reveals the presence of sizable investment multipliers in industry-level general equilibrium. Those offset most of the firm-level negative effect on investment highlighting the importance of intra-industry re-allocation.

While the discussion so far has focused on a historical natural experiment, the results carry significant relevance as of today. Between 1/2 and 2/3 of cash distributions to shareholders at US corporations in the 21st century have taken the form of shares repurchases, with the remainder consisting of dividends. At the same time as share buybacks have overtaken dividends in their relative importance, total payouts at US companies have steadily increased over the past two decades.

Large amounts of payouts have the potential to weaken firm's balance sheet position in a crisis, if insufficient funds are retained to build up buffers. In Section 2, I show that firms with higher share repurchases (relative to cash flow, net income or assets) during the 2010-decade have larger negative cumulative abnormal returns in the February 2020 stock market downturn.

The central question of the paper whether market forces push firms towards making myopic decisions relates to a large literature on contract theory and the organization of the firm, in particular multi-tasking models such as Holmström and Milgrom (1991), Holmström and Tirole (1993), Holmström (1999) and Acemoglu et al. (2008).

The corporate finance myopia literature was started by Stein (1988), Stein (1989) and Shleifer and Vishny (1990). More recent theoretical papers on corporate short-termism include Bolton et al. (2006) who discuss the dotcom-bubble, Milbradt and Oehmke (2015) who focus on firms choosing project length and Hackbarth et al. (2018). Empirical evidence largely centers around managers and their compensation (Edmans et al. (2017), Edmans et al. (2018)) and agency costs (Crane et al., 2016).

My paper also relates to a large corporate finance literature on firms' payout behavior going back to Lintner (1956). Those papers include Miller and Rock (1985), Brennan and Thakor (1990), Allen et al. (2000), empirical evidence by Grullon and Michaely (2002), Larrain and Yogo (2008), Derrien et al. (2013), Boissel and Matray (2019), Michaely et al. (2019).

Finally, my paper also relates to the literature in macroeconomics discussing weak investment and increasing payouts. These trends are discussed in Gutiérrez and Philippon (2016), Gutiérrez and Philippon (2017) and Gutiérrez and Philippon (2018). Terry (2017) provides empirical evidence and an estimated model highlighting the effects of managers' pressure to meet quarterly earnings forecasts. De La O (2019) discusses the effects of share repurchases on long-term trends in capital allocation without, however, providing microeconomic moments related to the 1982 shares repurchase liberalization. My paper provides a large set of micro moments and stresses the key role of short-termist owners.

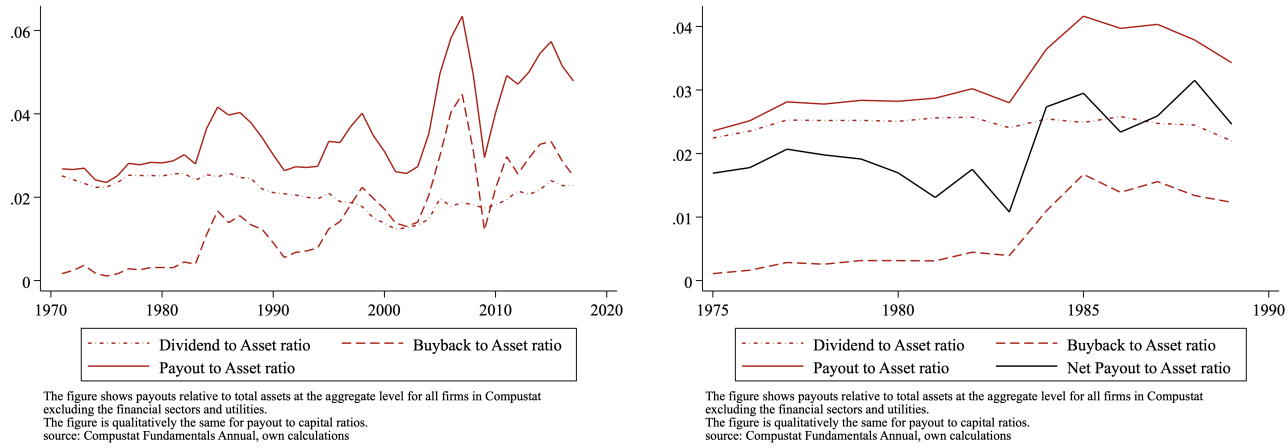
Section 2 provides aggregate evidence on the importance of share repurchases. Section 3

discusses the data and empirical approach. Results for the differences-in-differences estimation are presented in Section 4. Section 5 implements the insider holdings test. Section 6 provides estimates on industry general equilibrium effects and Section 7 concludes.

2 Aggregate Evidence

This section discusses the aggregate evidence. Most notably three facts stand out: share repurchases are the dominant form of payouts in the 21st century, the amount of repurchases is of a similar magnitude as investment, cash flow or net income and, finally, during the Covid-19 stock market downturn in February 2020, firms that had done more share buybacks prior to 2020, saw a greater negative stock price reaction. These three facts highlight the continued importance of companies' share repurchase activity in recent years before turning to the 1980s for the bulk of the empirical work.

Figure 1 shows aggregate payouts relative to total assets for non-financial, non-utility Compustat firms.



(a) 1970-2018 **(b)** 1975-1989

Figure 1: Payout ratios of US firms

A figure similar to the left-hand one has been computed by Gutiérrez and Philippon (2016) and Gutiérrez and Philippon (2018). The rising importance of share buybacks - the purchase of its own shares by a company - as a means of distributing cash to shareholders is evident. At the same time, dividends have remained relatively stable so that total payouts have increased considerably from slightly above 2% of total assets to up to 6% of total assets.

On the right-hand side, I add the net payouts ratio which subtracts equity issuance from gross payout while focusing on the 1975-1989 period which features 7 years before and after the 1982 share buyback liberalization. This addresses concerns that the rise in payouts to assets could be offset by an equal increase in equity issuance. However, Figure 1 reveals that the surge in payouts is not countered by increased issuance as net payouts and gross payout rise

to a similar extent. This statement extends to the 1990-2020 period. Payouts (net of equity issuance) have substantially increased.

Table 1 reports 2018 aggregates for the same firms as Figure 1:

	Volume in billion dollars
Share Buybacks	708.92
Dividends Total	415.52
Stock Issuance	148.71
Gross Investment	813.04
Cash Flow	1643.5
Net Income	906.42

Table 1: 2018 Aggregates

Share buybacks make up about 63% of cash distributions to shareholders exceeding the aggregate importance of dividends. The dollar amount spent on repurchases comes close to the amount spent on gross investment and equals about 75 % total net income.

These large disbursement to shareholders raise the question whether companies weaken their balance sheets. To understand this, I compute payout ratios for US firms for 2010-2019 and test whether they are related to cumulative abnormal returns in the 2020 Covid-induced stock market crash. This methodology was pioneered by Campbell et al. (1997) (for a recent application, see Acemoglu et al. (2016)). I focus on the stock market downturn from February 19 to February 28 2020, triggered by news about the escalating Covid pandemic as the event period. News about the spread of Covid-19 in Italy and other European countries as well as concerns about the impact of Covid-19 on the domestic economy led to a sell-off in US equity markets totaling in a more than 10 % drop within 10 days in the second half of February 2020. While the sell-off continued after a brief rebound well into March 2020, I focus on the initial downturn to have a well-defined event-period.

To obtain a benchmark for returns, I use data from January 1, 2019 up to January 19, 2020 - 1 month before the event time - consistent with the prior literature. For that time frame, I estimate the following model for returns R_{it} of firm i on trading day t:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it} \tag{1}$$

R_{mt} denotes the market return on day t for which I use the S&P 500 index. The abnormal returns AR_{it} on the event days in February 2020 are then defined as the returns of a stock in excess of the predicted return given the estimated coefficients $\hat{\alpha}_i$ and $\hat{\beta}_i$:

$$AR_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt} \tag{2}$$

Notice that while I use the same index t for time in equations 1 and 2, the former regression is estimated on the pre-event time window while the abnormal returns are computed for the

event times. Cumulative abnormal returns CAR_{it} are given by the sum of abnormal returns AR_{it} over the event time window:

$$CAR_i = \sum_{t=0}^{T} AR_{it} \tag{3}$$

Using these estimated cumulative abnormal returns, I then estimate whether firms' repurchase activity in the decade leading up to 2020 is related to cumulative abnormal returns during the Covid-19 stock market drop. I respectively normalize the total buyback volume of each firm by total assets, net income and cash flow. Using these measures, I run a cross-sectional regression of cumulative abnormal returns on a measure of buyback activity BB_i:

$$CAR_i = \alpha + \beta BB_i + \epsilon_i \tag{4}$$

This regression allows to test the hypothesis whether buyback activity prior to the Covid-19 crisis predicts abnormal stock returns at the onset of the crisis. Table 2 summarizes the results for the different normalizations:

	(1)	(2)	(3)
$\frac{\text{Buybacks}}{\text{Cash Flow}}$	-0.0220**		
	(0.0110)		
$\frac{\text{Buybacks}}{\text{Net Income}}$		-0.0135***	
		(0.0046)	
$\frac{\text{Buybacks}}{\text{Assets}}$			-0.2362**
			(0.1160)
N	2558	2560	2584
R^2	.0013	.0018	.0011

Results are from a regression of CAR from Feb19 to Feb28 on average buyback ratio over previous decade. $***p < .01, **p < .05, *p < .1$

Table 2: Cumulative Abnormal Returns during Covid-19

Regardless of normalizations, all three regressions find a significantly negative relationship between prior buyback activity and abnormal returns. Firms that repurchased relatively more shares experienced lower cumulative abnormal returns in February 2020 when the Covid-19 crisis reached the stock market supporting the notion that large amounts of share buybacks might leave companies vulnerable to negative shocks. The standard deviation of buyback to asset ratios is around 4 percentage points. A one standard deviation increase in that ratio implies a 1 % lower cumulative abnormal return. Hence, firms with higher normalized amounts of repurchases over the 2010s face a considerable negative stock price reaction at the onset of the Covid-19 crisis.

Overall, these results highlight how the analysis of share buyback liberalization in the 1980s carries relevance for current developments regarding corporate payout policies.

3 Empirical Strategy

3.1 Data

Data for US firms is from Compustat at yearly frequency. Ownership can be constructed from 13-f filings with the SEC which are available from 1980 onward from Thomson Reuters. These filings are filed by institutional investors exceeding $ 100 million in assets under management. They contain detailed stock holdings at the security level (CUSIP) for the universe of these institutional investors' holdings covering about 35-45 % of total stock market ownership in the US during the 1980s.

I merge the holdings data with CRSP and update shares outstanding from CRSP - in line with the previous literature (s. Ben-David et al. (2019), for example). Some firms have shares held by all institutional investors exceeding total shares outstanding. I drop those records. Finally, I update the manager identifiers from Thomson-Reuters to deal with the original identifiers being re-assigned when an institution exits. Appendix A contains more details on the sample selection criteria.

3.2 Summary Statistics

Table 3 summarizes the AUM-weighted median holding horizons across types of institutional investors as well as the turnover ratio, both computed at a quarterly frequency. There is a potential ambiguity regarding how to treat investment companies that offer several mutual funds. As noted by Schmalz (2018), "governance and voting are usually conducted at the family level". Thus, I record each investment company in the data, which contains their aggregate portfolio holdings across various funds.

Investor Type	N	Holding Period	Turnover
Banks	429	9.091168	-.0944875
Insurance Companies	122	10.06682	-.1198651
Investment Companies	125	7.951154	-.1498804
Investment Advisors	688	6.444815	-.1654995
Others(Pension Funds, Universities, Foundations)	172	9.926121	-.0932097

Table 3: Summary Statistics: Institutions

Insurance companies, University endowments and pension funds tend to have the longest holding horizons with a median of 10.06 and 9.92 quarters. On the other side of the spectrum, investment companies and investment advisors tend to have the shortest horizons with a median of 7.95 and 6.44 quarters. The turnover measures mirror this classification. Investment advisors turn over their portfolios almost twice as fast as pensions funds, universities and foundations

(16.5 % quarterly turnover versus 9.3%) This provides insights into which institutional investors will most likely be classified as short-termists: investment companies and investment advisors.

Finally, Table 4 presents an overview of the firms which are matched between Compustat and the Thomson Reuters holdings data.

Variable	Obs	Mean	Std. Dev.
Age	18382	17.106	9.348
Total assets	18382	747.355	3796.031
Cash flow	18164	.461	.66
Return on assets	18382	.033	.122
Gross investment/ total assets	17734	.081	.065
Net investment/ total assets	17748	.026	.067
Payout ratio	17729	.019	.023

Table 4: Summary statistics

The average firm is about 17 years old but there is large variation in age. Firms with higher short-termist ownership tend to be older and larger. Gross investment (replacement of depreciated capital plus net investment in new capital) is about 8% of total assets for the average firm. Net additions to the capital stock make up 2.6% of total assets. Both investment figures are subject to significant variation over time. Gross payouts are about 2% of total assets for the average firm.

3.3 Share-buyback reform

Until 1982, share buyback regulation in the United States was governed by the 1934 Securities Exchange Act. In the wake of the Great Depression, it targeted stock price manipulation. Most notably, a share repurchase program could trigger an SEC investigation. Some companies have been charged with price manipulation (SEC vs. Georgia Pacific 1960; Genesco (1966)) (Grullon and Michaely, 2002). Rather than an explicit ban, there was large regulatory uncertainty around share repurchases both for firms and for the brokers potentially involved, who could also be investigated under the Securities Exchange Act.

On November 26 1982, the SEC altered the landscape adopting rule 10b-18 which outlined how share repurchases on the open market could be conducted without violating the Securities and Exchange Act providing a so-called "safe harbor". It lays out the conditions under which a share repurchase program can be carried without violating SEC rules. In particular, there are restrictions on timing (no trading within the last 10-30 minutes of the trading day), volume (capped at 25% of daily trading volume) and the use of brokers (single broker on any given day). SEC chairman John Shad was quoted as follows: "Without the change, companies are inhibited from making big open-market buys" (Grullon and Michaely, 2002).

3.4 Identifying short-termist owners

The next building block for the analysis consists of identifying short-termist firm owners. I define the share of short-termist owners $\mu_{i,t}$ at firm i in quarter t as:

$$\mu_{i,t} = \sum_{j} s_{i,j,t} \boldsymbol{I}(\kappa_{j,-i} \leq 6)$$

j indexes institutional investors. $s_{i,j,t}$ captures the share of institution j in total ownership of a firm measured as the institution's share of total stock outstanding. $\kappa_{j,-i}$ is the median holding horizon of investor j across all their stock holdings. Firm i is excluded so that the firm-level measure $\mu_{i,t}$ is not driven by investors' holding horizons for the firm itself. The cutoff for an investor to be defined as short-termist is a median holding horizon κ below 6 quarters [1]. Empirically, $\mu_{i,t}$ is readily computed from the 13-f holdings data.

At the institution level, 82 % of investment advisors and 77 % of investment companies are classified as short-termist investors consistent with the earlier observations from Table 3.

The empirical strategy critically relies on variation in ownership by short-termist institutions across firms. Figure 2 plots the distribution of $\mu_{i,t}$ in the pre-reform period.

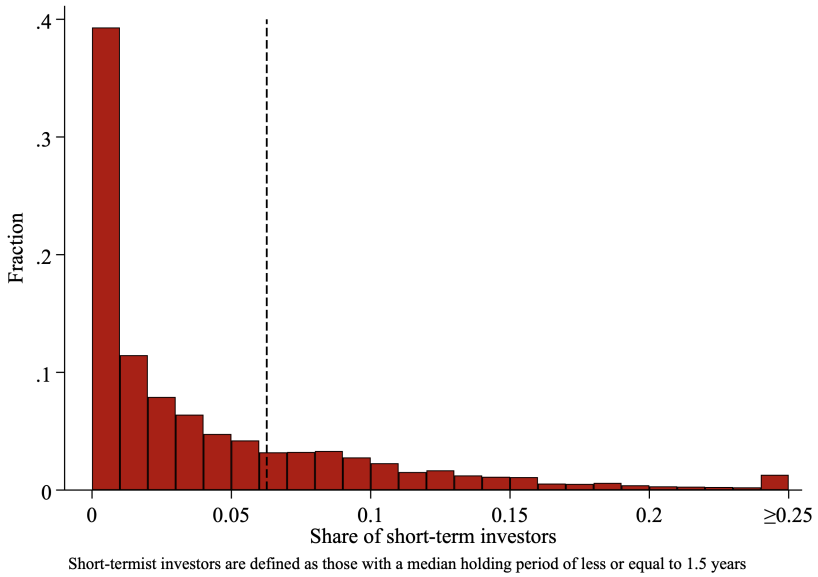


Figure 2: Share of short-termist investors across firms

There is substantial variation in the fraction of short-termist owners across firms. While many firms (almost 40%) have less than 1% of their shares held by short-termist investors, the distribution extends far to the right. The dashed line indicates the 75-percentile of the distribution, which corresponds to 6.27% of shares being held by short-termist investors. Moreover,

[1] Since $\kappa_{j,-i}$ excludes firm i each investor has a a marginally different κ for different firms. However, I can verify that no investor is sometimes classified as short-termist and sometimes as long-termist but instead the classification is unique for each institution.

the share of short-termist owners correlates positively with market capitalization. Larger firms are the ones that tend to have a greater fraction of short-termist owners.

To assess robustness of the main results with respect to the investor classification, I construct several other measures to identify short-termist investors. In a first step, the 6-quarter threshold is varied, second I compute the mean instead of median of investors' holding periods across firms. Finally, I compute the turnover ratio $T_{j,t}$ for each institution, defined as follows (consistent with Barber and Odean (2000) and Derrien et al. (2013)):

$$T_{j,t} = \sum_i \omega_{i,j,t} \Big(\frac{\text{Holdings Value}_{i,j,t} - \text{Holdings Value}_{i,j,t-1}}{\text{Holdings Value}_{i,j,t-1}} \Big)$$

Turnover is the weighted sum across all holdings of a given institution at a given point in time of the changes in the value of their holdings where the weights capture the portfolio share of those holdings at $t-1$ in the institution's total AUM. The measure is set to zero when net purchases occur to avoid double-counting transactions.

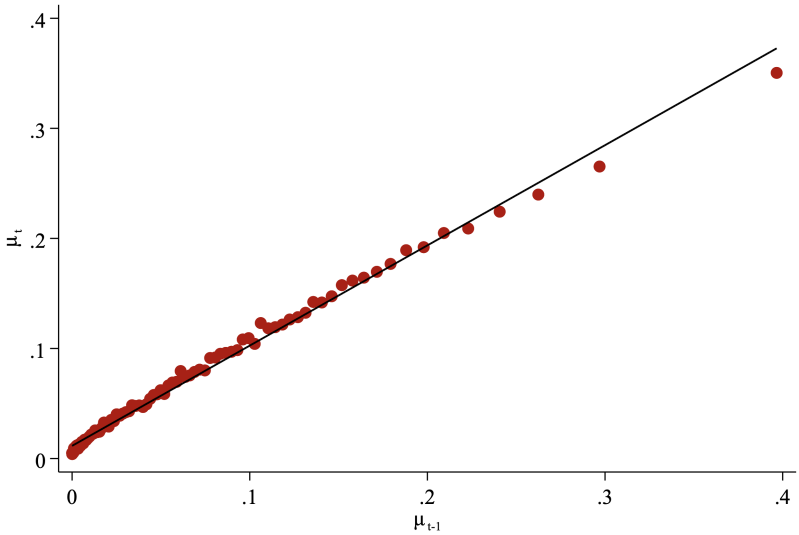
In Appendix C.1, the correlation between these several measures is reported. All the correlations are positive and large. The fact that the turnover ratio is highly correlated with the other measures is particularly comforting because the turnover ratio uses slightly different information on changes in holdings value compared to the mean and median measures, which all rely on similar measures of investors' holding horizons.

For the core of the empirical analysis, I work with yearly Compustat data. Hence, I aggregate the holdings data, in particular the share of short-termist owners $\mu_{i,t}$, at the yearly level before merging the two data sets. From now on, t refers to a year rather than a quarter.

The empirical strategy relies on identifying firms with higher and lower short-termist ownership to construct a treatment and control group. Since short-termists do not hold stocks for long, this raises the question whom short-termists trade with. Empirically, the share of short-termist owners across firms is persistent over time, suggesting that short-termists trade to a large extent with other short-termists. Figure 3 shows a binned scatter plot of the persistence of $\mu_{i,t}$ against its first lag.

Figures C.1 and C.2 in the Appendix show the same plot for the second and for the fifth lag, respectively. The positive autocorrelation is evident.

Partially, the high autocorrelation of short-termist ownership follows from its mirror image: long-termist ownership. Firms that have large long-termist ownership have few owners that continuously adjust their holdings. Consequently, as long as there is no differential pattern in the household sector's stock turnover across firms, firms with large long-termist ownership do not experience quick inflows of short-termist owners since there is little ownership turnover.



Binned scatter plot of lagged and contemporaneous μ. The number of bins is 100.
Time frequency is yearly. μ is defined as the share of short-termist firm owners.

Figure 3: Autocorrelation of μ

3.5 Why cater to short-termist owners ?

While short-termist investors hold a sizable fraction of shares in many public companies, they very rarely hold a majority of shares. How can they influence corporate decision-making? There are at least four pieces of evidence relating to shareholder activism, negotiations with management, price impact of large investors and survey evidence.

The 1980s are a period of rising shareholder activism including the emergence of hedge funds, many of which rely on activist strategies. Prominent examples in the data include Icahn Enterprises and Soros Fund Management. Among the tools at the disposal of activist shareholders are shareholder proposals filed at the annual shareholder convention, direct negotiations with management as well as proxy fights.

Carleton et al. (1998) provide a case study on the role of those private negotiations for the Teachers Insurance and Annuity Association, which I classify as a short-termist investor given their median holding period. Based on the protocols of the insurer's discussions with management, they show that the insurer obtains an agreement with management on governance issues raised during those meetings in more than 90 % of cases. Moreover, in the majority of cases, they do so without initiating a vote on a shareholder proposal.

Furthermore, recent research on demand-based asset pricing by Koijen and Yogo (2019) highlights the price impact of institutional investors, who trade against themselves when buying or purchasing stocks if demand is elastic. Demand elasticities at the 90th percentile of the distribution of institutional investors imply that a 10% demand shock leads to .8 - 1.5 % price increase depending on the type of institution. In turn, ex-post price impact provides institutional shareholders with an ex-ante mechanism to influence corporate governance.

Finally, survey evidence by Graham et al. (2005) finds that the majority of over 400 inter-

viewed executives would sacrifice positive net-present-value investment as to manage earnings. Cutting back on valuable investment is preferred to discretionary accounting choices by those managers.

3.6 Estimation

Having captured the heterogeneity in short-termist ownership across firms, I now turn to the empirical estimation. The first question I want to answer is: Does SEC rule 10b-18 affect firms' payout behavior? In a second step, the question is whether other firm-level outcomes are also affected. The empirical methodology to answer both of these questions will be similar.

The econometric framework is a differences-in-differences design where I compare firms with high short-termist ownership prior to the reform to firms with low short-termist ownership in the pre-reform period:

$$y_{it} = \alpha_i + \alpha_{t,ind} + \beta \textit{Post}_t \textit{Treat}_i + \gamma X_{it} + \epsilon_{it} \tag{5}$$

The pre-period is defined as 1980-82 while the post-period covers 1983-87. Firms are split along the pre-reform 75 percentile of the previously constructed short-termist ownership variable $\mu_{i,t}$. Practically, treated firms are those whose short-termist ownership exceeds 6.27%. The key coefficient of interest is β, which captures the differences-in-differences effect. Firm fixed effects α_i and time-industry fixed effects $\alpha_{t,ind}$ are added to the regression. The industry-level used are 4-digit SIC industries. Finally, X_{it} are a set of firm-level controls.

The key outcomes of interest in the first stage are payout variables. Notably, I use the net buyback to assets ratio defined as buybacks minus issuances divided by total assets, the dividends to assets ratio and the sum of these two, which is the net payout ratio. The net payout ratio measures all payouts to shareholders, that is dividends and repurchases, net of issuance relative to total assets.

In a second step, the same specification is estimated to analyze whether the reform has a differential impact on the investment dimension. For ease of comparison with the first stage, gross investment and net investment, which captures net additions to the capital stock, are again normalized by total assets.

In all specifications, standard errors are clustered at the firm-level.

The key identifying assumption for Equation 5 is that outcomes trend in parallel prior to the policy change. Beyond a graphical inspection, this can be tested more formally using an event-study specification:

$$y_{it} = \alpha_i + \alpha_{t,ind} + \sum_{\substack{\tau=1980 \\ \tau \neq 1982}}^{1987} \beta_\tau \mathbf{1}(\tau = t) \textit{Treat}_i + \gamma X_{it} + \epsilon_{it} \tag{6}$$

The variable definitions remain unchanged. However, we can now trace out the sequence

of coefficients β_τ and test for the absence of pre-event trends. For the event-study specification, the 1982 coefficient is normalized to zero.

Conceptually, the null hypothesis embraces Modigliani-Miller: Payout policy does not respond to the availability of share repurchases and reforms to payout policies do not have an effect on investment behavior. The alternative that reforms to payout policy affect investment behavior includes but is not limited to a setting where short-termist frictions arising from firm ownership break the Modigliani-Miller result.

Before delving into the empirical results, I check the balance of covariates across treated firms with high short-termist ownership and their untreated counterparts with relatively low short-termist ownership in Table 5.

	Control		Treated	
	mean	sd	mean	sd
Total Assets	453.24	4426.22	1311.53	3048.68
RoA	0.04	0.11	0.06	0.07
Cash Flow	0.46	0.69	0.54	0.49
Leverage	0.25	0.18	0.23	0.15
Inst. Holding Share	0.09	0.10	0.34	0.16
Age	14.19	8.30	20.36	9.60
Observations	3936		1675	

Table shows balance of covariates across control and treated firms in the pre-reform period (19080-82). RoA is measured as net income over assets. Cash Flow is ebitda over capital. Leverage is debt over assets.

Table 5: Balance of Covariates

Treated firms are larger, have higher return on assets, a larger total share of institutional owners and are older. Consequently, I include these variables as control - for age, I use age fixed effects as a more comprehensive way to control for cross-age heterogeneity. Controlling for total institutional ownership is particularly crucial because the main sorting variable, the pre-reform share of short-termist owners, could simply proxy for institutional ownership. However, by including the total share of institutions I ensure that the differences-in-differences coefficient picks up the differential impact of short-termist ownership controlling for the total share of institutional ownership.

4 Empirical Results

4.1 Effects on payouts

The first question is whether short-termism affects firm's payout behavior. Then, in the second stage - if payout behavior is affected - we can ask whether other decisions at the firm level are affected as well. Precisely, I will test whether the liberalization of share repurchases

in November 1982 has a differentially stronger impact on firms that have higher short-term oriented ownership.

4.1.1 Graphical Evidence

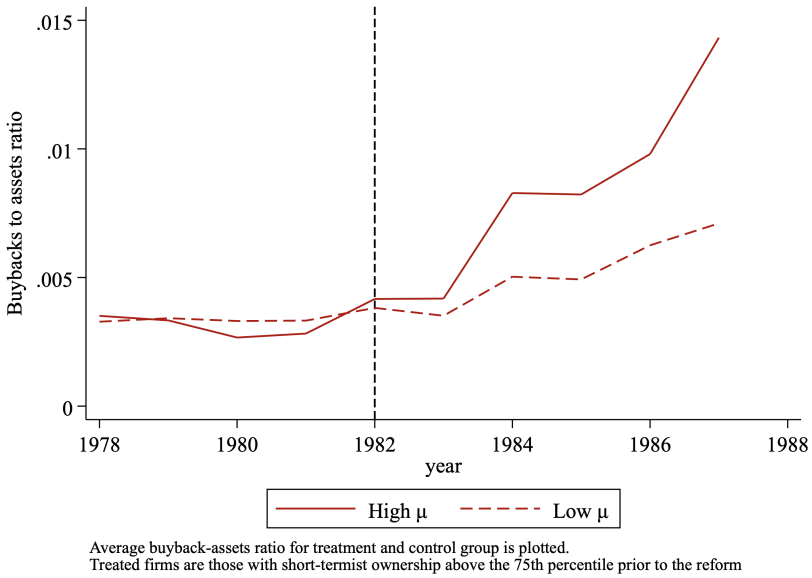


Figure 4: Buyback to Asset ratios around 1982

Figure 4 presents graphical evidence on the impact of the reform. Firms are split along the 75-percentile of pre-reform short-termist ownership into the treatment and control group. I then report the average buyback-to-assets ratio across both groups.

Until the reform in November 1982, buyback to asset ratios trend in parallel across both groups of firms. Following the reform, a large wedge opens up. This is a first piece of evidence that share repurchase liberalization differentially affects firms with high short-termist ownership. However, the vast heterogeneity across firms reported in Table 5 raises the question whether the differences observed in Figure 4 are simply due to firms across both groups being markedly different. Therefore, a formal estimation exercise is needed and results are reported in the next section.

4.1.2 Discrete DiD estimation

Table 6 reports results from the raw discrete differences-in-differences estimation from equation 5 without fixed effects. All ratios are multiplied by 100 so that a net payout ratio of 1 corresponds to net payouts being 1% of total assets.

Firms with high short-termist ownership increase their net payout ratios following the reform by about .86 percent of total assets. The median firm in the sample has a payout-to-asset ratio of .88% so this corresponds to nearly a doubling of its net payout-to-asset ratio. Breaking down this increase in payouts reveals that the entire increase stems from an increase in net

	$\frac{NetBuybacks}{Assets}$	$\frac{Dividends}{Assets}$	$\frac{NetPayouts}{Assets}$
Treated x Post	0.8793***	-0.0183	0.8610***
	(0.2424)	(0.0427)	(0.2494)
Treated	-0.0467	0.6618***	0.6151**
	(0.2367)	(0.0672)	(0.2670)
Post	0.3936***	-0.1715***	0.2221
	(0.1487)	(0.0233)	(0.1525)
N	14008	14008	14008
R^2	.0039	.0472	.0066

This table shows how payouts evolve after buyback liberalization in Nov 1982. Treatment is defined as being above the 75 percentile of short-termist ownership prior to the reform. The post-period starts in 1983-87. The pre-period covers 1980-82 Standard errors are clustered at the firm level. Controls are total institutional ownership, lagged total assets and lagged RoA. $***p < .01, **p < .05, *p < .1$

Table 6: Differences-in-differences estimation

buybacks while the response of dividends is both statistically and economically insignificant. This supports the interpretation of the effect stemming from repurchase liberalization. It also argues against the substitution hypothesis stating that dividends and buybacks are simply substitutes for one another. According to the substitution hypothesis, any increase in repurchases or reduced issuance should be matched by a decline in dividends as both payout methods are perfect substitutes. The results in Table 6 do not support this hypothesis. In the next step, the same regressions are repeated including firm and year-industry fixed effects. Firm fixed effects remove time-invariant differences across firms which addresses concerns such as short-termists simply owning firms with higher average payout ratios driving the results. Year-industry fixed effects remove variation stemming from other macroeconomic or industry-wide shocks[2].

	$\frac{NetBuybacks}{Assets}$	$\frac{Dividends}{Assets}$	$\frac{NetPayouts}{Assets}$	$\frac{NetBuybacks}{Assets}$	$\frac{Dividends}{Assets}$	$\frac{NetPayouts}{Assets}$
Post	0.71***	-0.10***	0.61***			
	(0.19)	(0.02)	(0.19)			
Treated x Post	1.28***	0.08*	1.36***	1.18***	0.06	1.24***
	(0.35)	(0.04)	(0.36)	(0.39)	(0.05)	(0.39)
N	13417	13417	13417	13412	13412	13412
R^2	.322	.879	.385	.468	.905	.516
Firm FE	x	x	x	x	x	x
Year-industry FE				x	x	x
Firm Controls				x	x	x

This table shows how payouts evolve after buyback liberalization in Nov 1982, controlling for total institutional ownership, lagged total assets and RoA. Treatment is defined as being above the 75 percentile of short-termist ownership prior to the reform. The post-period starts in 1983-87. All regressions include firm, year-industry and age fixed effects. The pre-period covers 1980-82 Standard errors are clustered at the firm level. $***p < .01, **p < .05, *p < .1$

Table 7: Differences-in-differences estimation

Table 7 reports results from the fully saturated regressions. While the results in Table 6 exploited both within and across-firm variation, the inclusion of firm fixed effects effectively only leaves within-firm variation. The net payout ratio increases by 1.24% of total assets at

[2]Results are completely robust to using year fixed effects only. Year-industry fixed effects are used as to make these regressions consistent with the investment regressions to follow, where year-industry fixed effects account for differential investment opportunities across industries.

firms with high short-termist ownership. This is large both relative to firms' average payout ratios and relative to their investment activity. Again, the key margin driving this increase is the net payout margin while the response of dividends is quantitatively an order of magnitude smaller and statistically at most barely significant. This is consistent with the availability of share buybacks since November 1982 affecting firm-level payout behavior.

To further test the identifying assumption of parallel trends, I proceed to estimating event studies. All variable and fixed effects definitions carry over. However, I now include yearly interactions of an indicator for that particular year with the treatment variable. This allows to zoom in on the timing and test the identifying assumption.

The event-study plots to follow report the respective series of estimated β-coefficients with their 95 % confidence bands. Figure 5 strongly confirms the differences-in-differences results and provides further support for the empirical design.

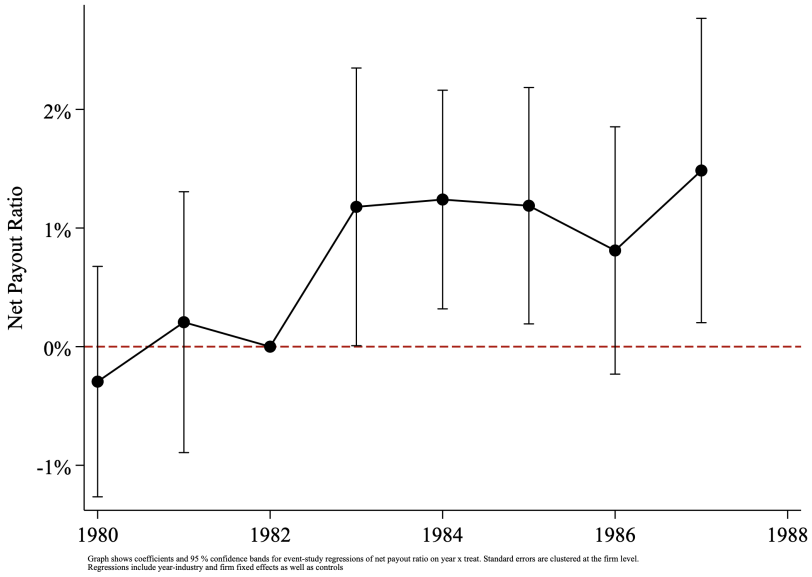
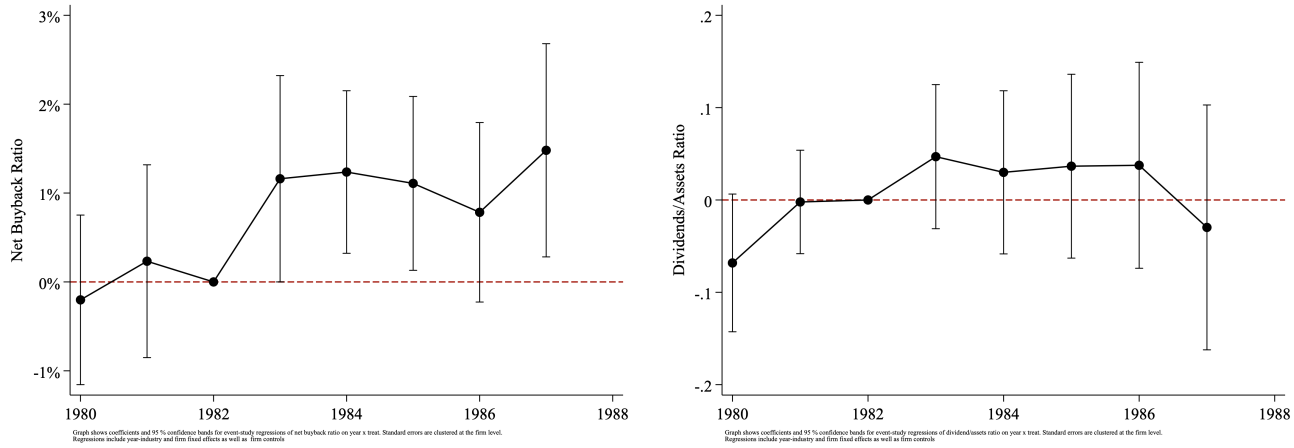


Figure 5: Net payout ratio over time

The figure clearly shows that net payout ratios increase strongly differentially precisely after the reform in November 1982. Prior to the reform, all estimated coefficients are insignificant and very close to zero. Figure 6 contains the corresponding event studies for dividends and net buybacks. They confirm that the increase in net payouts is driven by net share repurchases. The post-reform response of dividends is never significant in these event-study specifications and an order of magnitude smaller.

4.2 Effects on investment

Results in the previous section clearly indicate that firms with higher short-termist ownership substantially raise their payout ratios by about 1.2% of total assets. Those additional funds being paid out to shareholders must originate from reductions on other margins. In particular,



(a) Net Buyback Ratio **(b)** Dividends Assets Ratio

Figure 6

this section investigates investment outcomes. The key measures of investment are gross and net investment relative to total assets. Thus, the estimates can easily be compared to those from the previous section. While gross investment ($\Delta k_{it} + \delta k_{it-1}$) captures the entire investment activity by the firm, net investment subtracts replacement of depreciated capital so that it only measures net additions to the capital stock (Δk_{it}).

4.2.1 Graphical Evidence

Figure 7 plots the evolution of the gross investment to capital ratio at treated and untreated firms in the 1980s. The 1982 ratio of both time series is normalized to 1:

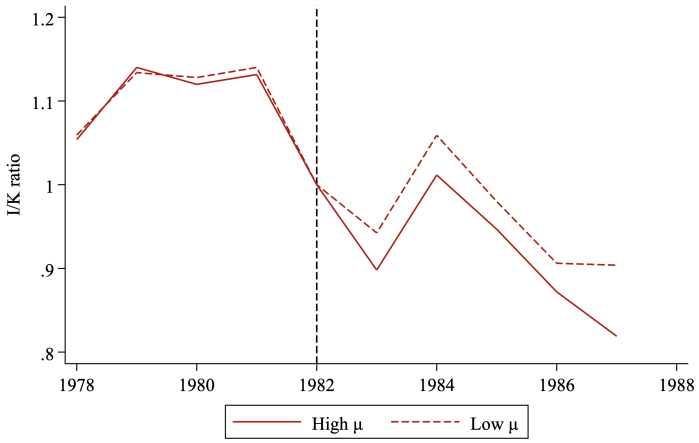


Figure 7: Normalized I/K ratio

Both ratios trend completely in parallel until 1982. Following share buyback liberalization and the surge in net payouts documented earlier, investment at treated firms declines differentially

more. The plot therefore suggests that firms are substituting between investment and payouts. However, Figure 7 does not take into account any of the cross-firm heterogeneity. Therefore the next section reports econometric results.

4.2.2 Discrete DiD estimation

The empirical set-up is the same as in equation (5). Formally, I test whether firms with a higher short-termist ownership reduce their investment (relative to total assets) differentially after the reform.

	$\frac{GrossInvestment}{Assets}$	$\frac{GrossInvestment}{Assets}$	$\frac{NetInvestment}{Assets}$	$\frac{NetInvestment}{Assets}$
Treated x Post	-0.83***	-1.02***	-1.24***	-1.15***
	(0.32)	(0.28)	(0.33)	(0.36)
N	13961	13941	13961	13941
R^2	.0418	.697	.118	.53
Firm Controls	x	x	x	x
Firm FE		x		x
Year-industry FE		x		x

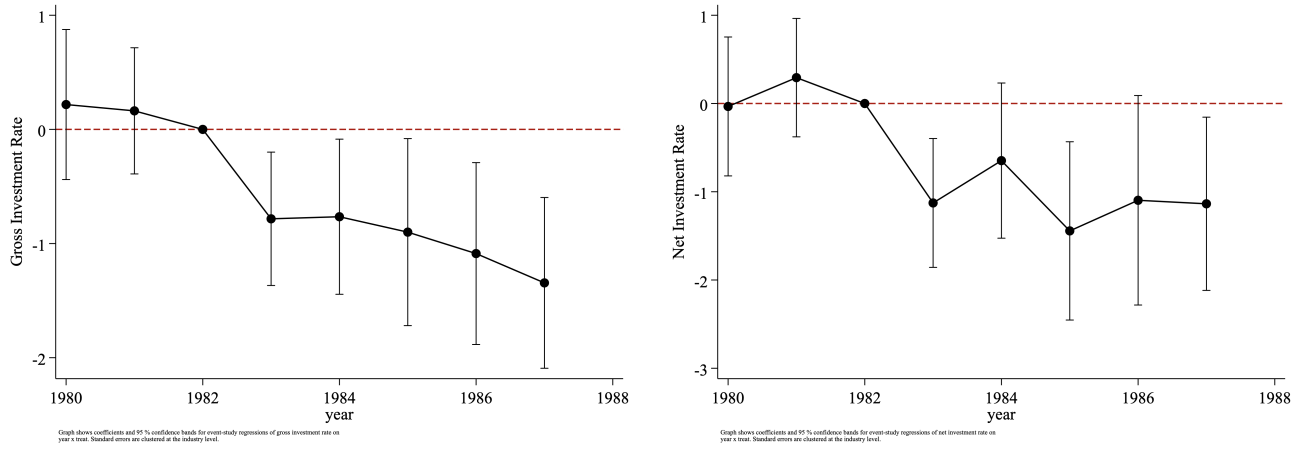
Table 8: DiD: investment rate

Effects on gross and net investment rates are quantitatively comparable. In the raw regressions with firm controls only, both fall by .82 and 1.23% of total assets respectively. These effects are larger, about 1.0-1.1% of total assets in the saturated regressions. The average gross investment rate is 8.1% of total assets, the average net investment rate is 2.6% of total assets. Thus, the estimated fall in investment at firms with higher short-termist ownership is quantitatively large. Frequently, investment rates are negative when firms do not replace all of their depreciated capital. To facilitate interpretation of the estimated β coefficients in the investment regressions, we can relate them to the standard deviation of investment rates. A one percentage point fall in gross and net investment rates corresponds to about 15% of one standard deviation [3].

Relying on an event-study specification, the underlying parallel trends assumption can be tested formally and the timing can be investigated more precisely. The inclusion of year-industry fixed effects is particularly important here to remove not only time trends but also heterogeneity in investment trends and investment opportunities across sectors.

Figure 8 shows that trends in both real and gross investment rates are approximately parallel prior to the reform with a sharp and statistically significant drop in the first post-reform year 1983. The drop persists over time. If anything, point estimates in 1987 are slightly larger than the initial post-reform estimate. It is striking how the investment event studies are close to being mirror images of the event-studies for net payouts. Thus, there is evidence for the basic trade-off

[3]The standard deviation of gross investment and net investment rates are 6.5% and 6.7% respectively.



(a) Gross investment rate

(b) Net investment rate

Figure 8: Investment rate event studies

emphasized in the theoretical myopia literature: Firms with greater short-termist ownership reduce investment activities but increase payouts after share repurchase liberalization, which increases payout flexibility.

5 Alternative Stories

Results so far paint a clear picture: Firms with higher short-termist ownership increase payouts at the expense of investment following share buyback liberalization. Interpreting these results is not straightforward, though, because they are consistent with at least two broad interpretations. First, it could be that firms with higher short-termist ownership were inefficiently over-investing until 1982. After the 1982 share buyback reform, they paid out those funds that were previously invested. This would imply that share buyback reform provides firms a means of efficiently sizing down. For the remainder, I will refer to this mechanism as "efficient downsizing mechanism".

The second set of of mechanisms that could be at work could originate from short-termist capital market pressures, consistent with the myopia literature. Given the greater flexibility of share repurchases relative to dividends, firms with greater short-termist ownership use a buyback-driven increase in payouts in an attempt to signal higher intrinsic value. Those signaling considerations come at the expense of positive net present value investment. This second mechanism will be referred to as "myopia mechanism."

This section provides first a formal test to discriminate between the two hypotheses using insider holdings data. Then, several other potential explanations are discussed.

5.1 Insider Holdings Test

To disentangle more precisely between the "efficient-downsizing" and the "myopia" hypotheses, this section proposes a test based on insider holdings data. The idea underlying the test is as follows: Following share buyback reform, firms with high short-termist ownership substitute from investment to payouts. If this follows the "efficient downsizing" argument, prospects for the firm have not worsened. Thus, incentives for insiders to hold stock in their firms are not affected or would even improve. On the other hand, the "myopia" argument stipulates that the change in firms' behavior is ultimately inefficient. In that case, insiders have an incentive to sell their shares and reduce their portfolio's exposure to the firm. Thus, the trading behavior of insiders at firms with high short-termist ownership can provide information that allows to separate the two hypotheses. The underlying assumption for insider trades to reveal any information beyond market prices is that insiders have some information about the firm that is not immediately observable by all market participants and can also not be inferred by all market participants. Since insider trades are published only with delay and total insiders holdings are quantitatively very small at about .1% of total market value (Jeng et al., 2003), the public cannot readily infer how insiders traded in the 1980s from publicly available data or from aggregate market movements.

For insider trading data, I use two data sources. Starting in 1986, Thomson Reuters Insiders Data covers the universe of stock transactions by corporate insiders.[4] These filings are mandatory for corporate insiders defined as "officers and directors, and any beneficial owners of more than ten percent of a class of the company's equity securities" by the SEC [5]. In order to obtain data for the period around the 1982 share buyback reform, I digitize insider tradings data for the 1978-1985 period from the SEC's Official Summary of Security Transactions and Holdings.

Both sets of data capture the information from SEC Forms 3, 4 and 5, which record executed trades by firm insiders. Merging both of these datasets therefore provides a full account of insider trading at US public firms from 1978 until 1987, covering the same time period as the previous empirical analysis.

The insider trading data contains the following information: name of insider, firm, amount of holdings, transaction date, type of transaction (sale or purchase) and amount of shares transacted. Combining post-transactions holdings and the amount of shares transacted, I can infer the pre-transaction amount of holdings. While Thomson Reuters does some checking for mistakes in the records, the data still contains mistakes such as more shares being purchased than are held post-transaction. Those are removed from the data. For more details on the digitizing procedure and data construction, see Appendix B. Critically, I remove transactions by large institutional shareholders to avoid a mechanical correlation between the μ-measure

[4]Derivative Transactions are not available before 1996.

[5]https://www.sec.gov/fast-answers/answersform345htm.html

and any measures of insider trading, which would otherwise bias downward the regression coefficients in equation 8. Summary statistics at the trade-level for those firms that are matched to Compustat are provided in Table 9:

Variable	Obs	Mean	Std. Dev.
Sale Flag	47097	.443	.497
Number of Shares Bought	26134	11747.85	364437.1
Purchase Price	14546	16.761	21.959
Number of Shares Sold	20298	9607.043	84793.58
Sale Price	15394	25.679	47.095

Table 9: Summary Statistics: Insider Trades

Notice that many firms are not matched to Compustat, because the analysis focuses on non-financial Compustat whereas the bulk of insider transactions take place in the financial sector.

"Sale flag" is a binary indicator for whether an insider transaction is a sale ($Sale = 1$) or a purchase ($Sale = 0$). As we can see, 44.3 % of transactions are sales. Next I break down the numbers of shares transacted, The average transaction involves more than 10,000 shares in either trading direction but there is large skewness in the distribution. For a small fraction of trades, only the sale-flag is reported so that the number of observations with numbers of shares bought or sold is lower than the total number of observations. For more than half of the transactions, transaction prices are also observed.

5.1.1 Logit Estimation

In a first step, I test the predictive power of short-termist ownership onto insider transactions. Using the binary classification of transactions as sales or purchases, a logit model is estimated, separately for the pre-reform (1978-1981) and for the post-reform (1983-1987) period. These regressions show whether the predictive power of short-termist ownership for insider trades has changed around 1982. The data is three-dimensional consisting of trades by insider j of firm i at time t.

$$P(Sale_{ijt} = 1) = \frac{1}{1 + \exp(-[\beta \mu_{i,t-1} + \gamma X_{i,t-1}])} \tag{7}$$

Controls are RoA, size and total institutional ownership. $\mu_{i,t-1}$ is lagged ownership by short-termist institutions. All right-hand side variables are lagged by one year. Equation 7 tests whether short-termist ownership predicts insider sales. Table 10 reports the marginal effects from the logit estimation, with the pre-reform period in the first two columns and post-reform estimates in the last two columns. The underlying logit coefficients are reported in Table C.2. One would worry that large short-termist institutional investors would also qualify as insiders

so there would be a mechnical relationship between the right-hand side measures of short-termist ownership and insider transactions. This is the reason for dropping records of insider transactions by institutional investors in the insider trading data. Having done that, there is no a-priori correlation between explanatory variables and outcomes.

	78-81	78-81	83-87	83-87
Sale Flag				
μ_{t-1}	-0.2186***	0.0343	0.1952***	0.2642***
	(0.0730)	(0.1113)	(0.0324)	(0.0512)
RoA		0.3737***		0.0576**
		(0.0800)		(0.0292)
log(Assets)		-0.0448***		-0.0257***
		(0.0037)		(0.0019)
Total Inst. Holdings		0.1248**		0.0930***
		(0.0508)		(0.0252)
N	12226	12224	39017	38985
Pseudo R2	5.4e-04	.0145	6.8e-04	.0045

Logit Regression marginal effects for predicting insider sales. Standard errors are Huber-White heteroskedasticity robust. $***p < .01, **p < .05, *p < .1$

Table 10: Logit Marginal Effects

Prior to the reform, short-termist ownership, as measured by $\mu_{i,t-1}$, has either no or negative predictive power for insider transactions as evidenced in the first two columns. In the post-reform period, the reverse is true. High ownership by short-termist institutional investors predicts high sales by insiders in the subsequent year. Moving from 0% to 10% of short-termist owners raises the likelihood of an insider sale by 2.5 percentage point for the following year. The effect is quantitatively large when compared to the other control variables. These results suggest that share buyback reform and the effects on corporate decisions analyzed earlier also affect trading incentives for corporate insiders after 1982. Since this analysis was only a predictive test, the next subsection provides a more formal test for the pattern highlighted in Table 10.

5.1.2 Difference-in-Differences Estimation

To make the firm-level analysis comparable to the earlier sections, I aggregate the insider data at the firm level. For 2103 unique firms, this yields a measure of the propensity by insiders to sell shares and of the transaction amounts of corporate insiders.

In this step, I estimate regression 8 at the firm level. This provides a stronger test than the logit model because I now explicitly test whether those firms most affected by the reform display different insider trading behavior after SEC rule 10b-18 is passed.

$$\frac{\textit{Insider Sales}_{it}}{\textit{Total Insider Trades}_{it}} = \alpha_i + \alpha_{t,ind} + \beta Post_t Treat_i + \gamma X_{it} + \epsilon_{it} \tag{8}$$

The differences-in-differences design is the same as in equation 5 and all variable definitions

carry over, including the set of control variables X_{it} (RoA, total assets and total institutional ownership). The coefficient of interest is β. It tests whether insider sales make up a greater fraction of transactions in the post-reform years at firms that have high pre-reform short-termist ownership. Table 11 reports results both from an unweighted and from a size-weighted estimation of equation 8:

	Unweighted	Weighted
Post x Treated	0.0847**	0.3770**
	(0.0428)	(0.1593)
N	6702	6700
R^2	.655	.759
Firm FE	x	x
Time-industry FE	x	x
Controls	x	x

Table 11: Linear Regression

The fraction of insider sales among all insider trades rises significantly both in the unweighted and in the weighted regression. For the average firms, the fraction rises by 8.5 percentage points. The increases are more concentrated among larger firms so weighting by size reveals an increase by 37.7 percentage points after the reform.

Taken together, these results show that insiders at firms, which have more short-termist ownership prior to the reform, exhibit more insider sales following the reform. These results are consistent with the surge in payouts and the cuts in investment after the reform having a negative impact on those firms so insiders opt for selling stakes in their company. On the other hand, if paying out potential free cash flows and reducing investment was efficient, one would expect $\beta \leq 0$ in equation 8, which was statistically rejected.

5.2 Other candidate explanations

If the rise in share repurchases is primarily about paying out excess cash balances, one should observe treated firms holding larger amounts of cash relative to untreated firms. However, in the data, I observe the opposite. The average cash balance (relative to assets) at treated firms is 2.8 % whereas it is 4.1 % for the control group. Hence, clearly, those firms that increase payouts following the reform do not have larger ex-ante cash holdings.

The "efficient downsizing mechanism" also suggests that treated firms should have lower investment opportunities in the post period. Having lower investment opportunities relative to the control group, would imply lower investment according to standard q-theory. Empirically, Tobin's Q is similar across both groups.

Finally, there is a large literature on how changes to dividend taxation affect firm behavior. The old public finance view (Poterba and Summers, 1985) suggests that lower payout taxes

increase investment as the after-tax marginal product of investment increases. Since share repurchases are taxed at a lower rate for most shareholders[6], the liberalization of share repurchases effectively lowers the tax rate on distributions. According to the old view in public finance, this should boost investment. There is not evidence for that. Investment slows in the aggregate and those firms that repurchase the most, hence make the most use of the lower tax rate, actually reduce their investment.

The "new view" in public finance (Auerbach (1979), Bradford (1981)) stipulates that marginal investment is financed out of retained earnings or debt rather than through new equity issues. A lower payout tax has no effect on investment since the increase in the after-tax return on investment is exactly offset by the opportunity cost of investment (see Yagan (2015) for a more detailed discussion). This view cannot explain the results either.

6 Industry-level general equilibrium

The entire analysis so far focused on the firm-level dimension. What happens at the industry-level when some firms reduce their investment while increasing their payouts? Can firms with more long-termist ownership step in and potentially fill in parts of the investment gap or does the entire industry reduce investment ? These questions are inherently about intra-industry reallocation and therefore about industry-level general equilibrium effects. Methodologically, I address these questions using recent advances in the estimation of general equilibrium multipliers (Sarto (2018) and Mian et al. (2019)). The interest in this nascent literature is not primarily on recovering macro elasticities from regional data (see Beraja et al. (2019) and Chodorow-Reich (2020) for examples) but rather how to recover regional elasticities that are potentially affected by regional general equilibrium effects from data on microeconomic observations such as households. Here, I apply a similar methodology in a corporate finance setting to uncover intra-industry general equilibrium effects. The definition of industry are 4-digit SIC codes of which there are 357 unique codes in the data for the relevant 1980-87 time period.

The procedure of Mian et al. (2019) relies on a two-step methodology. In a first step, which corresponds to the estimation of equation 5, the firm-level effect is estimated. The industry-year fixed effects absorb any industry-level general equilibrium effects such as wage patterns, industry-level price indices or industry-level shocks. Hence, equation 5 identifies the partial equilibrium effect within an industry holding all other forces constant. Notice that the year-industry fixed effects also absorb all economy-wide general equilibrium effects. To open up the black box of industry-level general equilibrium effects, which could potentially mitigate

[6]They are taxed at the capital gains tax rate while dividends are taxed at the owner's income tax rate. The latter exceeds the capital gains tax rate by about 30 percentage points in the higher tax brackets implying that share repurchases are the more tax-efficient way to pay out earnings - at least for shareholders in the higher income tax brackets.

the impact of lower firm-level investment at firms with high short-termist ownership, I estimate the industry-level analogue of equation 5. However, given the relatively low frequency of the data, there are too few quarterly observations aggregated at the economy-wide level to estimate the economy-wide general equilibrium multiplier.

To uncover the industry general equilibrium effects, I estimate the industry-level version of 5 where all variables are aggregated at the industry level. Thus, $y_{ind,t}$ is the mean of outcome y in industry ind in year t. The same holds for the construction of the treatment and of the control variables at the industry level.

$$y_{ind,t} = \alpha_{ind} + \alpha_t + \beta_2 \textit{Treat}_{ind} \text{ x } \textit{Post}_t + \gamma X_{ind,t} + \epsilon_{ind,t} \tag{9}$$

The principal empirical strategy is unchanged. Only the level of the variation is now different. Equation 9 uses within-industry variation to identify β_2 . Most crucially, the difference between β_2 and β, which was obtained from estimating equation 5, reveals the size of within-industry general equilibrium effects. This is the key result from Mian et al. (2019). If β and β_2 are identical, the industry-level effect corresponds to the firm-level effect. Hence, there is no difference between the industry-level outcomes and firm-level outcomes. No forces at the industry-level mitigate or amplify the firm-level outcomes. Importantly, this would not imply the absence of higher-order general equilibrium effects at the economy level. The time fixed effects absorb any shocks at the economy-wide level such as productivity shocks or business cycle shocks, which affect all firms.

If β_2 were to exceed β, there would be within-industry amplification. For example, increasing payouts at some firms - those with higher short-termist ownership - could trigger general re-allocation away from that industry.

Table 12 reports the industry-level results for the three main outcomes of interest: net payouts, gross and net investment. As before I express the ratios as percentages of total assets:

	$\frac{\text{Net Payouts}}{\text{Assets}}$	$\frac{\text{Gross Investment}}{\text{Assets}}$	$\frac{\text{Net Investment}}{\text{Assets}}$
Treated x Post	1.6128***	-0.4263	0.7756
	(0.6097)	(0.5756)	(0.6811)
N	2658	2677	2679
R^2	.48	.595	.393
Controls	x	x	x
Year FE	x	x	x
Industry FE	x	x	x

Table 12: Industry-level GE effects

These results are very interesting both on the payout and at the investment dimension. In industries with more treated firms net payouts are 1.6 percentage points higher (measured relative to total assets). This industry-level effect is slightly larger than the firm-level outcome in Table 7 although the difference is not statistically significant. Hence, there is little general

equilibrium impact on the payout margin. The industry-level effects of the reform on payouts are almost entirely driven by the firm-level response, which was estimated at about 1.24 percentage points (relative to total assets). Thus, increasing payouts do not lead to general equilibrium amplification on the payout margin.

On the investment margin, however, results are substantially different. Neither for net nor gross investment is the coefficient statistically significant. Moreover, the point estimate for net investment actually turns positive, while the firm-level results in Table 8 reported a negative firm-level response. While the industry-level estimates are less precise due to the lower number of observations at the industry-level, the difference between β_2 and β is clearly positive at the 4-digit industry-level. This implies significant within-industry re-allocation of investment. While firms with higher short-termist ownership reduce investment, there is substantial re-allocation of investment. As a result, I cannot reject the null hypothesis that short-termist ownership has no post-reform effect on investment. At the same time as firms with higher short-termist ownership cut back on investment, their counterparts with more long-term ownership expand their investment activity .

7 Conclusion

This paper uses a natural experiment - share repurchase liberalization in the United States in 1982 - as a natural experiment to study frictions in firms' payout decisions. I find evidence that companies with higher short-termist ownership increase their payouts substantially following the reform. This comes at the expense of lower investment expenditures. The same firms that raise their payouts by about 1.2% percent of total assets, representing a large and unprecedented increase in payouts, reduce their investment by an almost equal amount. In sum, these results highlight the presence of an investment-payout trade-off that is exacerbated by the presence of short-termist firm owners.

To better understand these results and separate between an efficient-downsizing and a myopic interpretation, a test using newly digitized insider trading data is conducted. Under the assumption that corporate insiders have a non-zero degree of information advantage over the average market participant, these tests provide additional information beyond analyzing market values. Concretely, higher short-termist ownership predicts insider sales and firms with higher pre-reform short-termist ownership have more insider sales after the reform. This is consistent with a myopia interpretation where firms with higher short-termist ownership inefficiently increase payouts in an attempt to signal better prospects to the market,.

Finally,l the payout effects persist at the industry-level. However, there is a sizable general equilibrium multiplier that undoes much of the firm-level investment effect. This result highlights the importance of intra-industry re-allocation. Investigating these empirical results within a structural corporate finance model remains an avenue for future research.

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A Firm Data Construction

All data is accessed through WRDS. Data cleaning for Compustat follows standard practice in the investment-macro literature (for example: Ottonello and Winberry (2018)) From the raw Compustat data, I exclude the financial sector (SIC: 6000-6999) and the heavily regulated utilities sector (SIC: 4900 - 4999). Firms incorporated outside the US are excluded as well as those with negative sales, negative total assets or negative employment. Furthermore, I exclude firms with acquisitions exceeding five percent of total assets. I also require firms to be present in the sample both in the pre-reform period (prior to 1982) and in the post-reform period (after 1982). Data is winsorized at the 2-98 percent level. To deflate nominal quantities, I use implicit price deflators from the Bureau of Economic Analysis (https://apps.bea.gov/iTable/iTable.cfm?reqid=19&step=2#reqid=19&step=2&isuri=1&1921=survey).

Further data is being sourced from CRSP and Thomson-Reuters s-34 files. CRSP and the TR holdings data are being merged at the CUSIP-year-month level. Finally, in some cases, total holdings by one institutional manager exceed total shares outstanding for that firm (221 observations). Consistent with prior literature such as Ben-David et al. (2019), I drop observations where holdings of one institutional manager in a particular firm exceed 50 %. This drops a total of 1,397 observations out of 5.8 million. Ultimately, the CRSP data is used to update shares outstanding relative ot the Thomson-Reuters data. Then, we compute holding shares at the manager level. I remove observations where total holdings across all managers exceed a share of 100 % (.2 % of all observations, 13,562 manager-quarters).

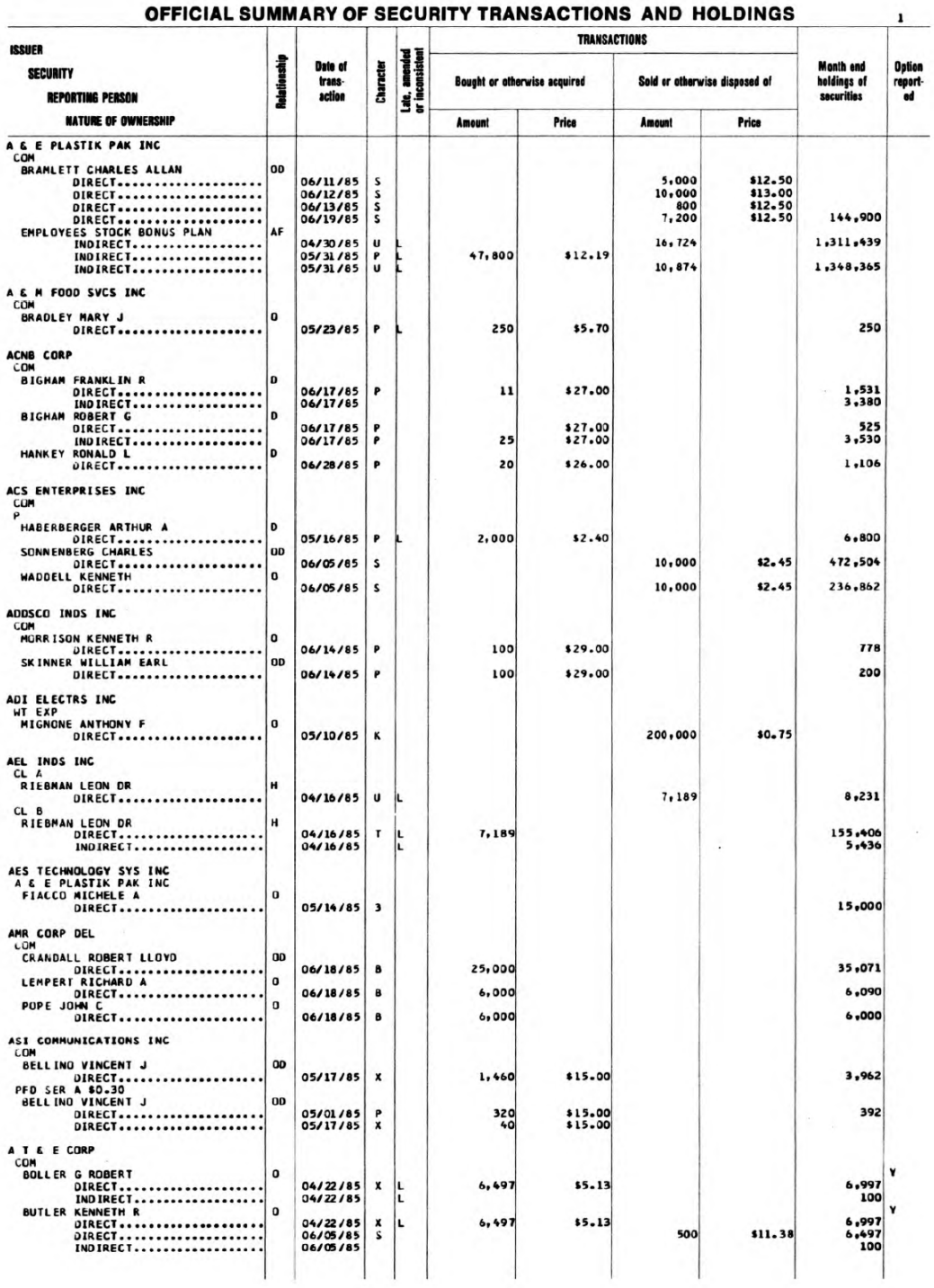
B Insider Trading Data Construction

The first component of insider trading data for the 1978-1985 period consists of newly digitized data from the SEC's Summary of Security Transactions and Holdings. The data contains all corporate insider transactions for US public companies featuring company name, insider name, insider role, share type, transaction data, sale-purchase indicator, transaction amount and price as well as end-of-month shareholdings for each insider. Figure B.1 provides an example for a scanned page from the source data. For each year, there are around 1000 such pages with raw data.

I convert the data to Excel using OCR software (ABBYY Fine Reader). Next, I eliminate duplicate records and records with scanning mistakes (transaction amount or price incorrectly read). Mistakes in reading numbers, "O" instead of "0" for example, are corrected as well. Overall, I retain 88.5% of the original records.[7]

In the final step, I merge the insider trading data to Compustat using company names (Compustat variable comnam) and STATA's matchit algorithm. I keep matches with a similarity

[7] 971,058 separate transactions out of 1,097,401



OFFICIAL SUMMARY OF SECURITY TRANSACTIONS AND HOLDINGS 1

ISSUER / SECURITY / REPORTING PERSON / NATURE OF OWNERSHIP	Relationship	Date of transaction	Character	Late, amended or inconsistent	TRANSACTIONS: Bought or otherwise acquired — Amount	Bought or otherwise acquired — Price	Sold or otherwise disposed of — Amount	Sold or otherwise disposed of — Price	Month end holdings of securities	Option reported
A & E PLASTIK PAK INC										
COM										
BRAMLETT CHARLES ALLAN	OD									
DIRECT		06/11/85	S				5,000	$12.50		
DIRECT		06/12/85	S				10,000	$13.00		
DIRECT		06/13/85	S				800	$12.50		
DIRECT		06/19/85	S				7,200	$12.50	144,900	
EMPLOYEES STOCK BONUS PLAN	AF									
INDIRECT		04/30/85	U	L			16,724		1,311,439	
INDIRECT		05/31/85	P	L	47,800	$12.19				
INDIRECT		05/31/85	U	L			10,874		1,348,365	
A & M FOOD SVCS INC										
COM										
BRADLEY MARY J	O									
DIRECT		05/23/85	P	L	250	$5.70			250	
ACNB CORP										
COM										
BIGHAM FRANKLIN R	D									
DIRECT		06/17/85	P		11	$27.00			1,531	
INDIRECT		06/17/85							3,380	
BIGHAM ROBERT G	D									
DIRECT		06/17/85	P			$27.00			525	
INDIRECT		06/17/85	P		25	$27.00			3,530	
HANKEY RONALD L	D									
DIRECT		06/28/85	P		20	$26.00			1,106	
ACS ENTERPRISES INC										
COM										
P										
HABERBERGER ARTHUR A	D									
DIRECT		05/16/85	P	L	2,000	$2.40			6,800	
SONNENBERG CHARLES	OD									
DIRECT		06/05/85	S				10,000	$2.45	472,504	
WADDELL KENNETH	O									
DIRECT		06/05/85	S				10,000	$2.45	236,862	
ADDSCO INDS INC										
COM										
MORRISON KENNETH R	O									
DIRECT		06/14/85	P		100	$29.00			778	
SKINNER WILLIAM EARL	OD									
DIRECT		06/14/85	P		100	$29.00			200	
ADI ELECTRS INC										
WT EXP										
MIGNONE ANTHONY F	O									
DIRECT		05/10/85	K				200,000	$0.75		
AEL INDS INC										
CL A										
RIEBMAN LEON DR	H									
DIRECT		04/16/85	U	L			7,189		8,231	
CL B										
RIEBMAN LEON DR	H									
DIRECT		04/16/85	T	L	7,189				155,406	
INDIRECT		04/16/85		L					5,436	
AES TECHNOLOGY SYS INC										
A & E PLASTIK PAK INC										
FIACCO MICHELE A	O									
DIRECT		05/14/85	3						15,000	
AMR CORP DEL										
COM										
CRANDALL ROBERT LLOYD	OD									
DIRECT		06/18/85	B		25,000				35,071	
LEMPERT RICHARD A	O									
DIRECT		06/18/85	B		6,000				6,090	
POPE JOHN C	O									
DIRECT		06/18/85	B		6,000				6,000	
ASI COMMUNICATIONS INC										
COM										
BELLINO VINCENT J	OD									
DIRECT		05/17/85	X		1,460	$15.00			3,962	
PFD SER A $0.30										
BELLINO VINCENT J	OD									
DIRECT		05/01/85	P		320	$15.00			392	
DIRECT		05/17/85	X		40	$15.00				
A T & E CORP										
COM										
BOLLER G ROBERT	O									Y
DIRECT		04/22/85	X	L	6,497	$5.13			6,997	
INDIRECT		04/22/85		L					100	
BUTLER KENNETH R	O									Y
DIRECT		04/22/85	X	L	6,497	$5.13			6,997	
DIRECT		06/05/85	S				500	$11.38	6,497	
INDIRECT		06/05/85							100	

Figure B.1: Example for scanned insider trading data from 1985

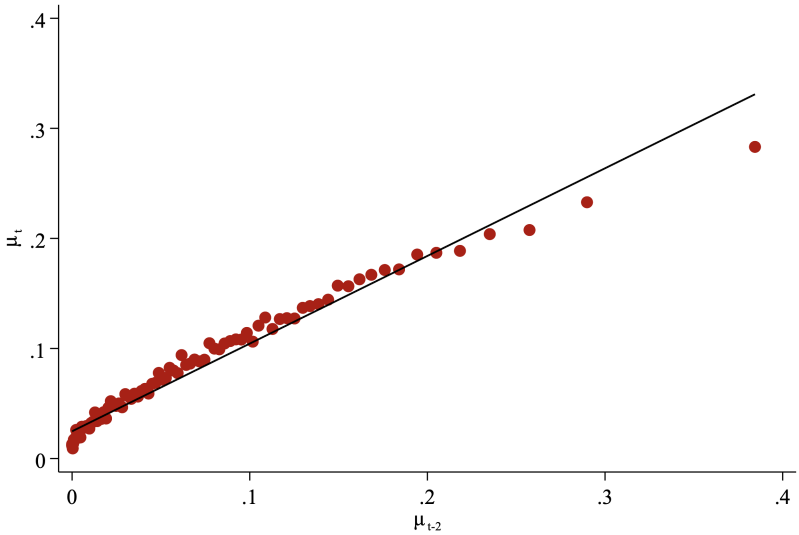
score above the 25th percentile, which keeps type-I matching errors close to zero and therefore reduces statistical noise in the estimation step. The final dataset features 2103 unique non-financial, non-utility firms.

C Supplementary Results and Robustness Checks

	Correlation
4 quarters	0.8054
5 quarters	0.9144
7 quarters	0.9294
8 quarters	0.8847
Turnover	0.7152
Mean	0.6376

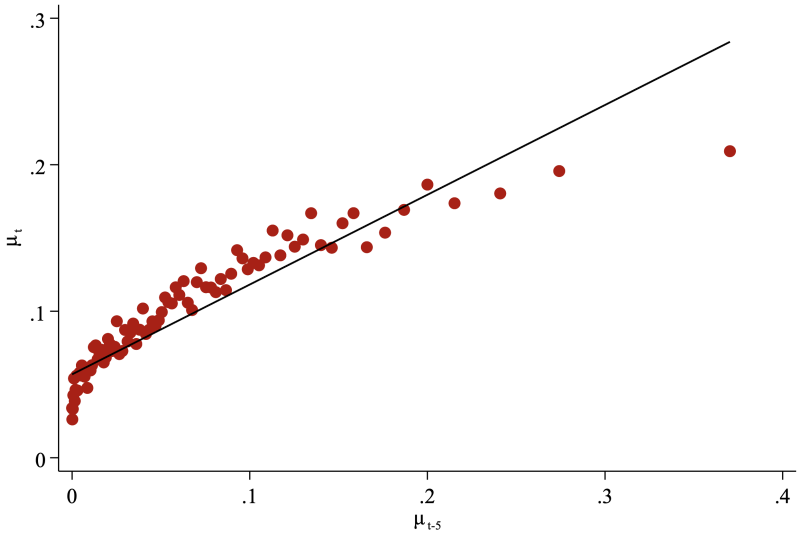
4 quarters refers to using a median holding period of 4 quarters (rather than 6 in the baseline) to define short-termist owners. The same applies to the other measures involving quarters. Further measures are an institution's turnover ratio and the mean holding period.

Table C.1: Alternative constructions for μ



Binned scatter plot of contemporaneous μ and its second lag. The number of bins is 100. Time frequency is yearly. μ is defined as the share of short-termist firm owners.

Figure C.1: Second lag autocorrelation of μ



Binned scatter plot of contemporaneous μ and its fourth lag. The number of bins is 100.
Time frequency is yearly. μ is defined as the share of short-termist firm owners.

Figure C.2: Fifth lag autocorrelation of μ

	78-81	78-81	83-87	83-87
Sale Flag				
μ_{t-1}	-0.8907***	0.1398	0.7823***	1.0590***
	(0.2973)	(0.4540)	(0.1298)	(0.2052)
RoA		1.5238***		0.2308**
		(0.3265)		(0.1171)
log(Assets)		-0.1825***		-0.1029***
		(0.0152)		(0.0076)
Total Inst. Holdings		0.5087**		0.3727***
		(0.2072)		(0.1008)
Constant	-0.2188***	0.4502***	0.0235	0.4409***
	(0.0254)	(0.0712)	(0.0153)	(0.0332)
N	12226	12224	39017	38985
Pseudo R2	5.4e-04	.0145	6.8e-04	.0045

Logit Regression results for predicting insider sales. Standard errors are Huber-White heteroskedasticity robust. $***p < .01, **p < .05, *p < .1$

Table C.2: Logit Estimates