Journal of Banking and Finance 110 (2020) 105656

Contents lists available at ScienceDirect

Journal of Banking and Finance

journal homepage: www.elsevier.com/locate/jbf

Shareholder investment horizons and bank debt financing ☆

Brandon N. Cline [a,*], Xudong Fu [b], Tian Tang [b]

[a] Department of Finance and Economics, Mississippi State University, United States
[b] Department of Finance, University of Louisville, United States

ARTICLE INFO

Article history:
Received 6 February 2019
Accepted 20 September 2019
Available online 23 September 2019

JEL classification:
G3
G31

Keywords:
Investor horizon
Debt financing
Monitoring avoidance

ABSTRACT

This paper investigates the impact of institutional shareholder investment horizons on a firm's use of bank debt. We find that short-term institutional ownership of the borrowing firm has a negative effect on bank debt financing. This finding provides evidence consistent with the monitoring avoidance incentives of short-term shareholders. In contrast, long-term institutional ownership has a positive impact on the firm's reliance on bank debt financing. These effects are attenuated by higher managerial ownership and more motivated investors and are exacerbated by higher information opacity. Our results are robust to potential endogeneity concerns, the potential use of bonds, firm size effects, and alternative measures of investment horizon. Investigating the effects of investment horizons on other aspects of debt corroborates our main findings.

1. Introduction

Debt financing is an important source of funding for U.S. corporations. Firms can raise debt from arm's-length investors, such as public bondholders, or from financial intermediaries, such as banks. Previous studies illustrate the relative benefits and costs of using bank debt as opposed to public debt (e.g. Diamond, 1984; Boyd and Prescott, 1986; Fama, 1985; Rajan, 1992; Chemmanur and Fulghieri, 1994). A few papers also explore firm characteristics, such as growth opportunities (Houston and James, 1996), credit quality (Denis and Mihov, 2003), corporate social capital (Hasan et al., 2017), or control-ownership divergence (Lin et al., 2013) as factors influencing a firm's amount of bank debt. The impact of shareholder investment horizons on a firm's use of bank debt, however, has not been explored in the literature. This study fills this void by investigating the association between institutional shareholder investment horizons and a firm's percentage of debt held by banks using a comprehensive sample of U.S. firms from 1990 to 2015.

Institutional investors, who are more sophisticated than individual investors (Baghdadi et al., 2018; Yang et al., 2016; Prevost et al., 2016), are now the major owners of U.S. firms[1]; however, these investors are far from homogenous (Hotchkiss and Strickland, 2003; Ferreira et al., 2017). One important dimension by which they differ is the length of their investment horizons.[2] This difference is economically important because institutional investors with short-term horizons have less incentive to spend resources on monitoring since they are less likely to invest long enough to recoup the costs of their monitoring efforts (Gaspar et al., 2005; Chen et al., 2007). Long-term investors, however, are more likely to use voice channels, which are direct interventions (Hirschman, 1970) and related to monitoring (Harford et al., 2018), as opposed to non-direct exit channels (Edmans and Manso, 2011).

Recent studies shed light on the impact of shareholder investment horizons on corporate decisions. These studies show that investor horizons impact firm investments, equity financing, payout choices (Derrien et al., 2013; Gaspar et al., 2013; Harford et al., 2018), value of a takeover deal (Gaspar et al., 2005), cost of debt and credit rating (Elyasiani et al., 2010), CSR investments (Kim et al., 2019), and insider trading (Fu et al., 2019). Consistent

☆ We are grateful to Collin Gilstrap, Junnatun Naym, Valeriya Posylnaya, Alvaro Taboada, Haoyang Xiong and an anonymous referee as well as the conference and seminar participants at Clemson University, Florida Atlantic University, the University of Louisville and the annual meetings of the Financial Management Association, and the Southern Finance Association for their helpful comments and suggestions. All errors and omissions are our own.

* Corresponding author.
E-mail addresses: brandon.cline@msstate.edu (B.N. Cline), xudong.fu@louisville.edu (X. Fu), lori.tang@louisville.edu (T. Tang).

[1] Blume and Keim (2017) find that the proportion of equities managed by institutional investors started to increase rapidly after the World War II, reaching 34% by 1980 and 67% by the end of 2010.

[2] These horizons vary due to differences in regulatory restrictions and competition (Yan and Zhang, 2009), investment objectives and strategies (Edelen, 1999), capability to continuously gather capital to implement long-term strategies (Schleifer and Vishny, 1997), and ability to process and trade on information (Scharfstein and Stein, 1990; Dow and Gorton, 1997; Yan and Zhang, 2009).

https://doi.org/10.1016/j.jbankfin.2019.105656
0378-4266/

evidence across this literature supports the short-termism vs. long-termism notion. Specifically, short-term investors press firms to achieve short-term goals at the expense of long-term value (Porter, 1992; Bushee, 1998, 2001). Conversely, long-term investors focus on the firm's long-term prospects and impose more efficient monitoring.

Banks, compared to public bondholders, are more efficient monitors who also use the voice channel. The monitoring benefits stem from (1) the alleviation of free rider problems, (2) access to superior information, (3) effective punitive measures, and (4) efficiency in renegotiation during financial distress. Due to the costs associated with monitoring (Rajan, 1992), free rider problems from diffuse ownership of public debt weaken individual bondholders' incentive to monitor. This is not the case, however, for banks with concentrated ownership (Esty and Megginson, 2003). Banks maintain a "continuous, intimate and flexible relationship" with borrowers (Myers, 1977) and hence enjoy comparative cost advantages (Diamond, 1991). In addition, because banks are "inside debt" (Fama, 1985), they have access to private information and assume the role of information producers (Leland and Pyle, 1977; Diamond, 1984). Third, due to the short maturity of senior bank debt, coupled with superior access to information, banks are effective in punishing firms that engage in expropriation and opportunistic behavior (Park, 2000). Lastly, to maintain their reputation, banks devote resources to monitoring so that they can make informed decisions when choosing renegotiation (Bolton and Scharfstein, 1996) or liquidation for companies in financial distress (Chemmanur and Fulghieri, 1994), and consequently face less coordination problems (Gertner and Scharfstein, 1991).

Each of these arguments theoretically suggests that not only are banks more efficient at monitoring, but also that they have a greater incentive to monitor.[3] Consequently, banks are more likely to impose strict monitoring on firms with higher proportions of short-term institutional ownership, making it more difficult for short-term equity investors to divert corporate resources for their own benefit. To avoid more stringent scrutiny and monitoring by banks, firms with higher short-term institutional ownership may rely less on bank debt financing (Lin et al., 2013). On the other hand, such firms with higher short-term ownership are in greater need of monitoring (Bharath et al., 2008; Chen et al., 2013). From this perspective they should rely more on bank debt (Houston and James, 1996; Denis and Mihov, 2003) to reduce value-destroying behavior from transient shareholders. If the avoidance of monitoring (need for monitoring) is the driving force, short-term institutional investment horizons will negatively (positively) relate to the proportion of bank debt financing.

In contrast, long-term equity investors are incentivized to monitor to safeguard their investment (Hirschman, 1970). Given the superior monitoring of banks, long-term investors may rely more on bank debt for additional security in their long-run stake in the firm. However, bank debt can bring disadvantages to long-term investors. Bolton and Scharfstein (1996) argue that compared to public debt, bank debt has an ex-ante disadvantage in that it increases the cost of debt. Cross-monitoring arguments by Datta et al. (1999) and Booth (1992) suggest that because long-term investors are already efficient monitors (Gaspar et al., 2005), bank monitoring can be less desirable when long-term equity investors are present.[4] If these monitoring advantages (cross-monitoring disadvantages) of bank debt are the dominant concerns for long-term investors, the ownership of long-term institutional investors will positively (negatively) relate to the proportion of bank debt financing.

Collectively, these theoretical arguments indicate that the association between shareholder investment horizons and firm bank debt remains an empirical issue. To test these theories, we construct investor horizon variables based on institutional investors' overall portfolio turnover following Gaspar et al. (2005). We find that ownership of short-term investors is negatively related to the firm's percentage of debt held by banks, supporting the notion that short-term investors reduce bank monitoring. This result is not only statistically significant but also economically significant. For example, a one-standard-deviation increase in short-term institutional ownership decreases bank debt by 3.18% at the mean. We also find a positive relation between long-term investor ownership and bank debt financing, indicating that long-term investors value the monitoring provided by banks.

Factors that increase the need for monitoring should magnify these associations. Thus, to further test the short-term investor bank monitoring avoidance hypothesis and the long-term investor bank monitoring reliance hypothesis, we investigate whether the findings are influenced by three factors related to monitoring needs. First, Lin et al. (2013) suggest a more pronounced monitoring need, and hence exacerbated monitoring avoidance, when the information environment is opaque. Consistent with their findings, we show that the negative association between short-term shareholder investment horizon and bank debt usage is enhanced by a firm's information opacity. Long-term shareholders, however, favor bank debt more when information opacity is more severe.

Second, managerial equity ownership is effective in facilitating internal and external monitoring (Jensen and Murphy, 1990; Datta et al., 2005), resulting in reduced marginal benefits from bank monitoring. This natural internal monitoring incentive should weaken short-term investors' desire to evade monitoring from banks and long-term investors' appetite for it. We find that managerial incentive compensation reduces the importance of bank monitoring for short-term investors, as reflected by their mitigated propensity to evade bank debt.

Third, Fich et al. (2015) show that motivated investors are themselves effective monitors. This implies that motivated investors will reduce short-term (long-term) investors' propensity to avoid (value) bank debt because bank monitoring is less beneficial in the presence of motivated, self-monitoring investors. Consistent with this hypothesis, we find that both the negative effect of short-term investors and the positive effect of long-term investors on bank debt percent are attenuated with the presence of motivated investors.

We perform a battery of robustness tests to address potential endogeneity concerns. One concern is reverse causality. Short-term (long-term) investors may be attracted to firms with less (more) reliance on bank debt. It is also likely that banks avoid firms with short-term investors due to short-term investors' impact on long-term value. Another possibility is that investor horizons and proportional bank debt financing are driven by some omitted and unobserved variables, such as firm investment opportunities, which could be related to both investment horizons (Harford et al., 2018) and proportional bank debt. To address these concerns, following Harford et al. (2018), we first split our horizon measures into quasi-indexers and non-quasi-indexers: the former is plausibly exogenous and the latter endogenous. Because quasi-indexers

[3] The theoretical hypotheses of efficient bank monitoring are supported by empirical evidence. For example, Datta et al. (1999) show that the existence of bank debt lowers the at-issue yield spreads for first public straight bond offers. A recent paper by Saunders and Song (2018) shows that bank monitoring is effective in reducing managers' risk-taking incentives. Companies that require monitoring, either due to high information risk (Bharath et al., 2008), greater tax avoidance (Hasan et al., 2014), or because of a recent restatement (Chen et al., 2013), also rely heavily on bank debt.

[4] Rajan (1992) also suggests that banks can negatively affect other capitalists through their own rent-seeking activities and management incentive distortion.

have less control over their portfolio selection, their holdings and horizons are less endogeneous to firm policies. Our results are consistent for both quasi and non-quasi-indexers.

We employ other methodologies as well to address endogeneity. First, we use change regressions, where the change in bank debt percent is regressed on changes in the investor horizons. This controls for time-invariant omitted factors that may drive both investor horizons and the use of bank debt. Second, we conduct 2SLS estimations by employing Russell 1000/2000 index switches as instruments for investment horizons (Schmidt and Fahlenbrach, 2017; Chang et al., 2015). Third, we exploit the 2003 mutual fund scandal (Anton and Polk, 2014) as an exogeneous shock on investment horizons using 2SLS methodology. Fourth, to address the potential dynamic relation between the bank debt ratio and shareholder investment horizon, we employ dynamic GMM tests (Wintoki et al., 2012). The results remain qualitatively unchanged. We also find a positive association between shareholder investment horizons and leverage, which provides additional support that the negative relation between short-term institutional ownership and bank debt percent is due to short-term investors' avoidance of bank debt to reduce the monitoring from the banks, but not driven by the possibility that short-term investors encourage the use of bonds. Additional tests on the effect of firm size suggest the primary results remain after considering that large firms tend to use more public bond financing, while some small firms depend primarily on bank financing (Diamond, 1991).

Finally, we investigate the effects of shareholder investment horizons on other aspects of debt. We find that shorter-horizon firms include fewer covenants to avoid monitoring when they issue public bonds. Also, firms with higher concentrations of short-term institutional investors use debt with longer maturity and less security, whereas firms with long-term investors use debt with shorter maturity and more security. These results provide further evidence in support of the hypotheses that shareholders with short investment horizons avoid external monitoring when making corporate debt decisions, whereas shareholders with long investment horizons find it beneficial.

This paper contributes to three strands of literature. First, it is related to recent discussions of voice and exit channels by shareholders to influence company decisions (Edmans, 2009; Edmans and Manso, 2011). While this study is motivated by recent papers, such as Derrien et al. (2013) and Lin et al. (2013), it extends the literature by showing the matching interactions of these two channels from shareholders' and debtholders' perspectives. We find that long-term shareholders, who exert their influence through monitoring (voice), choose private debt with advantages in intervention (voice). Short-term shareholders, who use more exit channels, prefer public debt with less voice but more exit possibility. Second, our work contributes to the debt choice literature. Our findings show that institutional shareholder investment horizons are an important dimension of shareholder heterogeneity, which has a significant impact on firms' bank debt. This paper, to the best of our knowledge, is the first to study this topic. Third, we contribute to the emerging investor horizons literature by extending prior studies on the relationship between institutions and debt decisions (Zhang and Zhou, 2018; Huang and Petkevich, 2016).

2. Hypothesis development

Institutional investors with shorter shareholder investment horizons are incentivized to allocate fewer resources to monitoring, as they are less likely to enjoy the benefits (Gaspar et al., 2005; Chen et al., 2007). Short-term investors also tend to trade more frequently to exploit short-lived private information (Yan and Zhang, 2009) and press managers to achieve short-term goals at the expense of long-term value (Porter, 1992; Bushee, 1998, 2001). These self-dealing incentives increase a firm's bankruptcy risk and impair collateral value. As a result, banks are more likely to impose strong monitoring in the presence of high short-term investor ownership. Anticipating more stringent scrutiny and monitoring from the bank, firms with higher short-term investor ownership may rely less on bank debt financing to avoid monitoring (Lin et al., 2013). If this monitoring avoidance dominates, we expect the ownership of short-term investors to negatively relate to the proportion of bank debt financing.

On the other hand, because short-term investors are more likely to extract private benefits at the expense of other shareholders, such firms are in greater need of monitoring (Bharath et al., 2008; Chen et al., 2013). From this perspective, firms with a higher proportion of short-term investors should rely more on bank debt (Houston and James, 1996; Denis and Mihov, 2003). If the need for monitoring is the driving force, we expect the ownership of short-term institutional investors to positively relate to the proportion of bank debt financing. We present our first hypothesis as follows:

H1a. *Ceteris paribus*, higher short-term institutional ownership reduces a firm's reliance on bank debt, consistent with the monitoring avoidance hypothesis.

H1b. *Ceteris paribus,* higher short-term institutional ownership increases a firm's reliance on bank debt, consistent with the monitoring needs hypothesis.

Comparatively, institutions with long-term investment horizons are more likely to engage in "relationship investing", which increases long-term investors' incentives for monitoring to safeguard their investment (Hirschman, 1970). As discussed above, bank debt financing has a distinct monitoring advantage due to the resulting reduction of free ride problems (Diamond, 1991), superior access to private information (Fama, 1985), punitive measures (Park, 2000), and efficiency in distress (Chemmanur and Fulghieri, 1994). If the monitoring advantages of bank debt prevail, we predict long-term investment horizons to positively relate to the proportion of bank debt financing.

Bank debt can, however, bring disadvantages to long-term investors. Investors with longer investment horizons spend significant time learning about their firms and engage in costly monitoring themselves (Gaspar et al., 2005). Furthermore, Datta et al. (1999) argue that cross-monitoring occurs when observable monitoring by one type of investors diminishes the duplicative monitoring by other investors. Booth (1992) supports this claim by showing that banks in fact spend less resources on monitoring when a firm is already monitored by other capitalists. Banks can also negatively affect other borrowers by self-rent-seeking and management incentive distortion (Rajan, 1992).

Taken together, these studies suggest that bank monitoring may be less desirable in the presence of institutional shareholders with long-term investment horizons. If these disadvantages of bank debt are the dominant concerns for long-term investors, we predict long-term investment horizons to negatively relate to the proportion of bank debt financing. Therefore, the effect of long-term shareholder investment horizons on the firm's choice in bank debt is an empirical question. We formally state our second hypothesis:

H2a. *Ceteris paribus*, higher long-term institutional ownership increases a firm's reliance on bank debt due to the superior monitoring benefits from using bank debt.

H2b. *Ceteris paribus*, higher long-term institutional ownership reduces the use of bank debt due to the disadvantages of cross-monitoring and rent-seeking behavior associated with bank debt.

3. Data and variables

3.1. Sample construction

To examine the impact of institutional investment horizons on a firm's percentage of debt held by banks, we obtain data from four primary sources: (1) Thomson-Reuters 13F institutional holding database, which provides ownership information for institutional managers with $100 million or more in assets under management; (2) Capital IQ, which provides detailed information on the corporate debt structure for both public and private companies; (3) Financial statement data from COMPUSTAT; and (4) stock return data from CRSP. For subsequent analysis financial analyst information is obtained from I/B/E/S, and managerial stock and option holding information is obtained from Execucomp. We restrict the sample to U.S. public firms and exclude regulated utilities (SIC 4900-4999) and financial firms (SIC 6000-6999). Our primary sample consists of 22,943 firm-year observations covering 4,646 firms from 1990 to 2015. We choose 1990 as the start year because this is the first year Capital IQ reports debt component information.

3.2. Shareholder investment horizon variables

To construct our shareholder investment horizon variables, we begin by calculating the turnover rate following Gaspar et al. (2005). We first calculate institutional investor *i*'s aggregate purchase in quarter *t* (*ChurnRate_buy* $_{i,t}$) using Eq. (1) and *i*'s aggregate sell in quarter *t* (*ChurnRate_sell* $_{i,t}$) using Eq. (2) as follows:

$$ChurnRate\_buy_{i,t} = \sum_{k=1}^{N_K} \left| \left(S_{k,i,t}P_{k,t} - S_{k,i,t-1}P_{k,t-1} - S_{k,i,t-1}\Delta P_{k,t} \right) \right| \quad if\ S_{k,i,t}P_{k,t} > S_{k,i,t-1}P_{k,t-1} \tag{1}$$

$$ChurnRate\_sell_{i,t} = \sum_{k=1}^{N_K} \left| \left(S_{k,i,t}P_{k,t} - S_{k,i,t-1}P_{k,t-1} - S_{k,i,t-1}\Delta P_{k,t} \right) \right| \quad if\ S_{k,i,t}P_{k,t} \le S_{k,i,t-1}P_{k,t-1} \tag{2}$$

$S_{k,i,t}$ and $S_{k,i,t-1}$ are the numbers of shares of stock *k* held by institutional investor *i* in quarters *t* and *t-1*, respectively; $P_{k,t}$ and $P_{k,t-1}$ represent the prices of stock *k* at the end of quarters *t* and *t-1*, respectively. We adjust for stock splits and dividends using the CRSP price adjustment factor. N_k is the number of firms held by institutional investor *i* in quarter *t*. The churn rate of investor *i* in quarter *t* is

$$ChurnRate1_{i,t} = \frac{(ChurnRate\_buy_{i,t} + ChurnRate\_sell_{i,t})}{\sum_{k=1}^{N_k} \frac{(S_{k,i,t}P_{k,t} + S_{k,i,t-1}P_{k,t-1})}{2}} \tag{3}$$

$ChurnRate1_{i,t}$ measures how frequently an institutional investor rotates her positions in all the stocks in her portfolio. A short-term investor has a high churn rate, as she trades her positions in the portfolio more frequently. A long-term investor has a low churn rate, with positions being held for a relatively longer period of time. We then calculate the average quarterly churn rate of each institutional shareholder over the past four quarters (*t-3*, *t*) to obtain a more stable and precise measure of the churn rate of institutional investors.

$$Average\ Churn\ Rate_{i,t} = \left\langle \frac{1}{4} \sum_{r=0}^{3} ChurnRate1_{i,t-r} \right\rangle \tag{4}$$

Short-term (mid-term/long-term) institutional investors are defined as the investors who have an *Average Churn Rate* in the top (middle/bottom) tercile. Based on the three terciles, we then specify three categories of institutional investor horizon: the percentages of firm's ownership held by short-term (*IO Short-term investors)*, mid-term *(IO Mid-term investors)*, and long-term (*IO Long-term investors)* investors (Yan and Zhang, 2009; Gaspar et al., 2013).

An alternative measure of shareholder investment horizons is the firm-level investor turnover rate contained in a single ratio. We use the average churn rate of each institutional investor to construct the aggregate investor turnover for firm *k* at quarter *t*. As shown in Eq. (5), we calculate the weighted average churn rate of all institutional investors in firm *k* in quarter *t*.

$$Investor\ Turnover\ (Turnover) = \sum_{i=1}^{J_i} w_{k,i,t} \langle Average\ Churn\ Rate_{i,t} \rangle \tag{5}$$

J_i is the total number of institutional investors reporting holdings in firm *k* and $w_{k,i,t}$ is the weight of institutional investor *i*'s holding in firm *k* in quarter *t*. Firms with high (low) institutional investor turnover are firms dominated by short-term (long-term) shareholders. We include this alternative measure of shareholder investment horizons for robustness purposes in baseline tests.

3.3. Debt structure variables

Following Lin et al. (2013), and using the detailed information of debt structure reported by Capital IQ, we construct two debt source measures, *Bank debt percent* and *Public debt percent*. *Bank debt percent* is calculated as the ratio of the sum of term loans and revolving credits divided by total debt. *Public debt percent* is calculated as the ratio of the sum of senior bonds and notes, subordinated bonds and notes, and commercial paper divided by total debt. Total debt is the sum of all types of debt, including term loans, revolving credits, senior bonds and notes, subordinated bonds and notes, commercial paper, capital leases, and other debt. Due to the small amount of capital leases and other debt for most firms, *Bank debt percent* and *Public debt percent* are close complements, thus using either measure as the test variable gives similar results with opposite signs. For brevity, we only report test results when *Bank debt percent* is used as the dependent measure.[5]

In addition to testing the impact of shareholder investment horizons on firms' bank debt percent, we also investigate the impact of shareholder investment horizons on three components of debt structure: debt covenants, debt maturity, and debt security. Covenants are measured by covenant intensity, which is equal to the number of covenants in a new debt issue (Bradley and Roberts, 2015; Nash et al., 2003). Debt maturity is measured using the proportion of total debt maturing beyond three years, and debt security is measured using the proportion of total debt secured by collateral (Johnson, 2003; Datta et al., 2005; Billett et al., 2007).

3.4. Control variables

In all specifications we include a vector of controls previously shown to influence the percentage of firm debt held by banks: *Profitability*, *Tangibility*, *Q*, *Leverage*, *Firm size*, and *Z-score<1.81* (Houston and James, 1996; Krishnaswami et al., 1999; Cantillo and Wright, 2000; Denis and Mihov, 2003; Lin et al., 2013). We also use year and industry (based on two-digit SIC code) fixed effects in our analyses. Detailed explanations of the construction of variables are provided in Appendix A.

Table 1 reports summary statistics for the firms in our sample. The average bank debt percent in the sample is 49.3%, and the

[5] The results are robust to using the alternative debt structure variables as a ratio of public debt to bank debt for all the firms with nonzero bank debt, and robust to the exclusion of capital leases and other debt from total debt to calculate the bank debt percent and public debt percent.

Table 1
Summary statistics.
This table presents summary statistics for three categories of variables used in our study: *Debt variables*, *Institutional shareholder variables*, and *Firm characteristics*. The primary sample contains 22,943 firm-year observations for U.S. firms spanning the period 1990 through 2015. A detailed description of each variable is provided in Appendix A and in the text.

Variable	Mean	Std Dev	Median	25th Pctl	75th Pctl	N
Debt variables:						
Bank debt percent	0.493	0.399	0.478	0.035	0.952	22,943
Public debt percent	0.379	0.384	0.282	0.000	0.743	22,943
Debt maturing >3 years	0.491	0.385	0.559	0.024	0.858	18,660
Secured debt	0.347	0.387	0.138	0.000	0.725	20,678
Institutional shareholder variables:						
IO Short-term investors	0.147	0.129	0.127	0.046	0.219	22,943
IO Mid-term investors	0.245	0.188	0.246	0.090	0.371	22,943
IO Long-term investors	0.160	0.121	0.147	0.057	0.240	22,943
Turnover	0.196	0.059	0.190	0.160	0.223	22,943
Motivated shares	0.124	0.183	0.044	0.000	0.183	22,943
Motivated funds	0.039	0.060	0.020	0.000	0.051	22,943
Firm characteristic variables:						
Profitability	0.064	0.500	0.113	0.056	0.165	22,943
Tangibility	0.542	0.438	0.427	0.210	0.784	22,943
Q	2.065	4.828	1.502	1.116	2.203	22,943
Leverage	0.254	0.604	0.212	0.084	0.351	22,943
Firm size	6.290	2.061	6.212	4.801	7.656	22,943
Z-score<1.81	0.169	0.375	0.000	0.000	0.000	22,943
Manager delta	0.267	0.214	0.207	0.110	0.369	9167
Number of analysts	7.330	6.785	5.000	2.000	10.000	17,121
Abnormal accruals	0.929	2.011	0.207	0.065	0.647	19,570

average public debt percent is 37.9%. The interquartile of bank debt percent is 91.7% and the interquartile of public debt percent is 74.3%. These suggest a wide variation of the use of bank debt across firms in the sample. Furthermore, the average institutional ownership of short-term (mid-term/long-term) horizon investors is 14.7% (24.5%/16.0%). Together, institutional owners on average hold 55.2% of the total shares outstanding in our sample, underscoring the importance of focusing on institutional owners for general shareholder analysis.

The average *Turnover*, a weighted average of churn rates across all institutional investors for a given company, is 0.196. Because it measures both purchases and sales, we interpret this ratio to suggest that for a typical company in our sample, a tenth of its institutional shareholders exit within a quarter. This implies that short-term investors constitute a sizable portion of all institutional investors. To minimize the possible effects of outliers in our regressions, all non-binary variables are winsorized at the 1st and 99th percentiles.

4. Empirical results

4.1. Baseline results

In this section, we investigate the influence of shareholder investment horizons on the use of bank debt. The dependent variable, the ratio of bank debt to total debt, is left-censored at zero and right-censored at one. Thus, we estimate with the following Tobit model:

$$\begin{aligned} &Bank\ Debt\ Percent_{i,t} \\ &= \alpha + \beta(Shareholder\ investment\ horizon\ variables_{i,t-1}) \\ &\quad + \gamma(Control\ variables_{i,t-1}) + Yeardummies \\ &\quad + Industry\ dummies + \varepsilon_{i,t} \end{aligned} \tag{6}$$

Table 2 presents estimation results of Eq. (6). Models 1, 2, and 3 include independently the percentage of ownership held by short-term, mid-term, and long-term institutional investors, respectively. The results suggest a negative and significant association between short-term institutional investor ownership and the proportion of bank debt. In Model 1, the coefficient on *IO Short-term investor* is −0.396 and significant at the 1% level. The average marginal effect is −0.246, indicating that a one-standard-deviation increase in the holding of short-term investors decreases the proportion of bank debt financing by 3.18% at the mean. By contrast, the results reported in Model 3 show a positive relation between the ownership of long-term institutional investors and the portion of bank debt. A one-standard-deviation increase in the holdings of long-term investors increases bank debt financing by 1.94%. The insignificant coefficient on *IO Mid-term investors* suggests the proportion of mid-term ownership has little impact.

The signs and significance of coefficients for the control variables are in line with those from the previous literature. In support of Lin et al. (2013), we find a negative association between Tobin's Q and the proportion of bank debt. Consistent with Denis and Mihov (2003), firm size remains an important factor in the debt decision, suggesting that smaller firms rely more on bank debt.

Model 4 reports the joint effects including all three groups.[6] When all three investment horizon measures are included in the same regression, *IO Short-term investors* remains significantly negative, and *IO Long-term investors* remains significantly positive. The results in Model 4 also indicate that mid-term shareholders significantly decrease the proportion of bank debt financing, although it is insignificant in Model 2 when we consider mid-term shareholder ownership in isolation.[7]

For robustness, Model 5 substitutes the three institutional investor horizon measures with firm-level *Turnover*. Consistent with the results from Models 1, 3, and 4, the results in Model 5 reveal a negative and significant coefficient for *Turnover*. Because *Turnover* is inversely related to shareholder investment horizon, this finding suggests that companies with longer average shareholder investment horizons are more likely to use bank debt.

[6] Because the sum of short-term, mid-term, and long-term shareholder ownerships is equal to total institutional ownership (IO), IO is dropped in Model 4.

[7] Test results reported in the sections to come reveal that the coefficient of mid-term shareholder ownership either loses significance or changes sign. We consider this evidence that the mid-term group contains a mixture of short- and long-term investors.

Table 2
Institutional investor horizons and bank debt percent.
This table reports Tobit regression estimates for the effect of institutional shareholder investment horizons on the use of bank debt for the sample of 22,943 firm-year observations for the period 1990 through 2015. The dependent variable is the *Bank debt percent*, defined as total bank debt divided by total debt, where bank debt is the sum of term loans and revolving credit. Models 1, 2, and 3 examine the effect of *IO short-term*, *IO mid-term*, and *IO long-term investors*, respectively. Each horizon measures the ratio of ownership by short-term, mid-term, and long-term institutional investors divided by the total ownership outstanding. Short-term, mid-term, and long-term are categorized as those institutional investors with an overall portfolio turnover rate in the top, middle, and bottom tercile, respectively. Model 4 reports the joint effects for all three investment horizon measures. Model 5 substitutes *Turnover* for the standard horizon measures. *Turnover* is defined as the firm-level weighted average churn rate by institutional investor. Detailed variable descriptions are provided in Appendix A. Tobit estimation methods are used controlling for industry and year fixed effects. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dep. Var: Bank debt percent					
	(1)	(2)	(3)	(4)	(5)
IO	0.018	−0.055***	−0.135***		−0.073***
	(0.016)	(0.019)	(0.015)		(0.012)
IO Short-term investors	−0.396***			−0.349***	
	(0.044)			(0.036)	
IO Mid-term investors		−0.058		−0.084***	
		(0.040)		(0.028)	
IO Long-term investors			0.258***	0.144***	
			(0.045)	(0.038)	
Turnover					−0.605***
					(0.065)
Profitability	0.509***	0.513***	0.508***	0.511***	0.502***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Tangibility	0.025**	0.031**	0.030**	0.022*	0.027**
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Q	−0.058***	−0.060***	−0.059***	−0.058***	−0.059***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Leverage	0.007	−0.003	0.000	0.008	−0.002
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
Firm size	−0.073***	−0.072***	−0.074***	−0.073***	−0.074***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Z-score<1.81	−0.040***	−0.045***	−0.042***	−0.041***	−0.037***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Year effects	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes
Observations	22,943	22,943	22,943	22,943	22,943

Collectively, the results reported in Table 2 indicate that short-term institutional shareholders tend to choose public debt financing over bank debt. Long-term shareholders on the other hand prefer bank debt financing to public debt. These relations between corporate debt choices and investment horizons are consistent with our hypotheses that short-term institutional shareholders rely more on public debt to avoid monitoring, while long-term institutional shareholders value the monitoring advantage of bank debt.

The results to this point are consistent with the prediction that monitoring concerns from shareholders with different investment horizons play an important role in the corporate debt decision due to their heterogeneous attitude toward bank monitoring. Next, we test these monitoring incentives by studying factors likely to impact the needs and benefits of bank monitoring. Specifically, the short-term investor monitoring avoidance (long-term investors' monitoring reliance) hypothesis predicts that the negative (positive) relation between short-term (long-term) stock holdings and the proportion of bank debt should be strengthened when the needs and benefits are greater. We therefore examine information opacity, managerial incentives, and investor motivation.

4.2. Information opacity

Less transparent firms are in greater need of monitoring (Lin et al., 2012). Short-term investors, who possess information advantages (Yan and Zhang, 2009), incur lower costs and have more incentives to extract short-term benefits at the expenses of long-term investors in opaque environments.[8] Anticipating the higher probability of rent extraction by short-term investors and other stakeholders, banks will monitor such companies more intensively. Consequently, short-term investors' incentives for bank debt avoidance should be enhanced with higher information opacity.[9] In contrast, expecting more value-destructing activities from short-term investors when information transparency is low, long-term investors should rely more on bank debt for its monitoring.

To investigate the effect of information opacity on the association between investment horizons and the use of bank debt, we construct two variables to proxy for information opacity: analyst coverage and abnormal accruals. Analyst coverage is calculated as the total number of financial analysts following a firm. Abnormal accruals are unsigned abnormal accruals computed using the Jones model (Jones, 1991) as modified by Dechow et al. (1995).

Table 3 reports estimates on the proportion of bank debt including our measures for opacity.[10] In Panel A, information opacity is proxied by the *Number of analysts*. Consistent with Bharath et al. (2008), who find that firms with higher information opacity use more bank debt, the coefficient on *Number of analysts* is significantly negative in all specifications. More important for us, however, is the interaction effect between the number of analysts and investor horizons. The coefficient on the interaction term between *Number of Analysts* and *IO Short-term investors* is positive and significant. This suggests that the negative relation between short-term shareholder ownership and the reliance on bank debt

[8] In unreported tests, we find that *Abnormal accruals* (*Number of analysts*) has a positive (negative) effect on *Turnover* ratio, suggesting that short-term (long-term) investors focus on firms with high (low) information opacity.

[9] In support of this argument Lin et al. (2012, 2013) find that information opacity has significant effects on a firms' controlling shareholders' incentives to avoid bank monitoring.

[10] Sample sizes are smaller in these models because some observations are dropped due to missing number of analysts or incomplete data to calculate abnormal accruals.

Table 3
Information opacity, institutional investor horizons and bank debt choice.
Tobit estimations of the effects of information opacity on the relation between institutional shareholder investment horizons and the use of bank debt are reported. The dependent variable is the *Bank debt percent*, defined as total bank debt divided by total debt, where bank debt is the sum of term loans and revolving credit. Panel A reports the results when information opacity is proxied by the *Number of analysts*. Panel B reports the results when information opacity is proxied by *Abnormal accruals*. Models 1, 2, and 3 of both panels examine the effect of *IO short-term*, *IO mid-term*, and *IO long-term investors*, respectively. Each horizon measures the ratio of ownership by short-term, mid-term, and long-term institutional investors divided by the total ownership outstanding. Short-term, mid-term, and long-term are categorized as those institutional investors with an overall portfolio turnover rate in the top, middle, and bottom tercile, respectively. Model 4 reports the joint effects for all three investment horizon measures. Detailed variable descriptions are provided in Appendix A. Tobit estimation methods are used controlling for industry and year fixed effects. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Panel A: Number of Analysts				
Dep. Var: Bank debt percent				
	(1)	(2)	(3)	(4)
IO	0.053***	−0.039*	−0.114***	
	(0.018)	(0.021)	(0.018)	
Number of analysts	−0.011***	−0.010***	−0.007***	−0.010***
	(0.001)	(0.002)	(0.002)	(0.002)
IO Short-term investors	−0.517***			−0.444***
	(0.066)			(0.061)
IO Short-term investors	0.016**			0.015**
* Number of analysts	(0.007)			(0.007)
IO Mid-term investors		−0.063		−0.090*
		(0.055)		(0.048)
IO Mid-term investors		0.009*		0.007
* Number of analysts		(0.005)		(0.005)
IO Long-term investors			0.367***	0.316***
			(0.068)	(0.063)
IO Long-term investors			−0.017***	−0.014**
* Number of analysts			(0.006)	(0.007)
Profitability	0.522***	0.526***	0.512***	0.518***
	(0.031)	(0.031)	(0.031)	(0.031)
Tangibility	0.028*	0.037**	0.034**	0.026*
	(0.014)	(0.014)	(0.014)	(0.014)
Q	−0.061***	−0.063***	−0.061***	−0.059***
	(0.004)	(0.004)	(0.004)	(0.004)
Leverage	−0.047*	−0.061**	−0.056**	−0.047*
	(0.027)	(0.027)	(0.027)	(0.027)
Firm size	−0.066***	−0.065***	−0.065***	−0.066***
	(0.003)	(0.003)	(0.003)	(0.003)
Z-score<1.81	−0.027*	−0.031**	−0.029*	−0.026*
	(0.015)	(0.015)	(0.015)	(0.015)
Year effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Observations	17,121	17,121	17,121	17,121
Panel B: Abnormal Accruals				
Dep. Var: Bank debt percent				
	(1)	(2)	(3)	(4)
IO	0.018	−0.053**	−0.128***	
	(0.017)	(0.021)	(0.017)	
Abnormal accruals	0.008**	−0.002	−0.005	−0.001
	(0.003)	(0.004)	(0.003)	(0.004)
IO Short-term investors	−0.343***			−0.272***
	(0.049)			(0.042)
IO Short-term investors	−0.045***			−0.075***
* Abnormal accruals	(0.017)			(0.020)
IO Mid-term investors		−0.071		−0.104***
		(0.044)		(0.034)
IO Mid-term investors		0.016		0.022
* Abnormal accruals		(0.012)		(0.015)
IO Long-term investors			0.224***	0.107**
			(0.051)	(0.046)
IO Long-term investors			0.040**	0.048**
* Abnormal accruals			(0.018)	(0.021)
Profitability	0.536***	0.540***	0.532***	0.534***
	(0.028)	(0.028)	(0.028)	(0.028)
Tangibility	0.021	0.030**	0.030**	0.020
	(0.013)	(0.013)	(0.013)	(0.013)
Q	−0.063***	−0.065***	−0.064***	−0.062***
	(0.003)	(0.003)	(0.003)	(0.003)
Leverage	0.013	0.002	0.006	0.014
	(0.026)	(0.026)	(0.026)	(0.026)
Firm size	−0.074***	−0.073***	−0.075***	−0.074***
	(0.003)	(0.003)	(0.003)	(0.003)
Z-score<1.81	−0.040	−0.047***	−0.043***	−0.042***
	(0.014)***	(0.014)	(0.014)	(0.014)
Year effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Observations	19,570	19,570	19,570	19,570

financing is significantly enhanced in the presence of less analyst coverage. In other words, short-term shareholders avoid bank debt financing more with higher information opacity.

In Model 3, the interaction term between *Number of analysts* and long-term shareholder ownership is negative and significant, indicating that long-term shareholders use more bank debt for additional monitoring when information opacity is severe. These two findings are robust to the inclusion of all three investment horizons and interaction terms reported in Model 4.

Panel B reports results where information opacity is proxied by *Abnormal accruals*. The coefficient on the interaction term between *Abnormal accruals* and *IO Short-term investors* is negative, suggesting that the negative effect of the short-term institutional ownership on bank debt financing is significantly enhanced with higher *Abnormal accruals*. *Abnormal accruals* also magnify long-term investors' reliance on bank debt as the interaction term between *Abnormal accruals* and *IO Long-term investors* is positive and significant.

Taken together, the results in Table 3 support our conjecture that information opacity intensifies the avoidance relation between short-term shareholder ownership and bank debt financing. We also find evidence that information opacity enhances the reliance relation between long-term shareholder ownership and the usage of bank debt.

4.3. Managerial incentives

Managerial incentive compensation ties top managers' personal wealth to company stock performance. Because vesting requirements of option- and stock-based compensation incentivize long-run performance (Fu and Ligon, 2010), CEOs with such plans have longer incentive horizons, making their interests more aligned with the interests of long-term shareholders (Cadman and Sunder, 2014). The implication is that managerial incentives reduce the benefits of bank monitoring, as firms with incentivized managers themselves impose direct monitoring and mitigate agency concerns (Masulis et al., 2009; Jensen and Murphy, 1990).

We therefore posit that in the presence of managers with long-term incentive compensation, it is more difficult for short-term shareholders to extract private benefits at the expense of long-term value. Hence, management incentive compensation lowers the monitoring avoidance of short-term shareholders and the monitoring reliance of long-term shareholders. We therefore anticipate a weakened association between investment horizons and bank debt financing when managerial incentives are high.

To test this conjecture, we construct *Manager delta*, which is the sensitivity of CEO income with respect to a 1% change in stock price (Core and Guay, 2002), to measure manager-shareholder alignment These test results are reported in Table 4. The coefficient on the interaction term between *Manager delta* and *IO Short-term investors* is positive and significant for Models 1 and 4, but the interaction term between *Manager delta* and *IO Long-term investors* is not significant. These results suggest that managerial sensitivity to stock price attenuates the negative effect of short-term investment horizons on bank debt financing, implying that managerial incentives reduce the benefits of bank monitoring and weaken short-term shareholders' avoidance of bank debt.[11]

4.4. Investor motivation

Investor motivation is another determinant of monitoring effort by shareholders (Bushee, 1998). Fich et al. (2015) find that the presence of motivated investors in target firms improves target firm shareholder returns during mergers and acquisitions, confirming that motivated investors are more effective in monitoring financial decisions. Nagel et al. (2015) show that motivated investors improve future payout and operating performance. These papers suggest that companies with more motivated institutional investors, who invest a sizeable portion of their portfolios in the firm, should benefit less from bank monitoring because they are already subject to strict scrutiny from their own shareholders. Therefore, similar to management incentive, we predict that the presence of motivated investors mitigates the association between bank debt and shareholder investment horizons.

Following Fich et al. (2015), we include two variables to proxy for investor motivation: the percentage of shares outstanding owned by motivated funds (Models 1 - 4), and the percentage of motivated funds (Model 5). A motivated fund is defined as an institution whose holding value of the firm is in the top 10% of all firms in that institution's portfolio.

As shown in Table 5, the interaction term of *IO Short-term investors (IO Long-term investors)* and *Motivated* is positive (negative) and significant at the one percent level in all models. Thus, in the presence of motivated investors, companies receive less benefit

Table 4
Managerial incentives, institutional investor horizons and bank debt.
This table presents Tobit regression results from estimating the effects of managerial incentives (*Manager delta*) on the relation between institutional shareholder investment horizons and the use of bank debt. The dependent variable is the *Bank debt percent*, defined as total bank debt divided by total debt, where bank debt is the sum of term loans and revolving credit. Models 1, 2, and 3 examine the effect of *IO short-term*, *IO mid-term*, and *IO long-term investors*, respectively. Each horizon measures the ratio of ownership by short-term, mid-term, and long-term institutional investors divided by the total ownership outstanding. Short-term, mid-term, and long-term are categorized as those institutional investors with an overall portfolio turnover rate in the top, middle, and bottom tercile, respectively. Model 4 reports the joint effects for all three investment horizon measures. Detailed variable descriptions are provided in Appendix A. Tobit estimation methods are used controlling for industry and year fixed effects. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dep. Var: Bank debt percent				
	(1)	(2)	(3)	(4)
IO	0.103***	−0.046	−0.150***	
	(0.032)	(0.038)	(0.029)	
Manager delta	0.050	0.051	−0.103*	−0.098
	(0.049)	(0.065)	(0.062)	(0.091)
IO Short-term investors	−0.515***			−0.387***
	(0.080)			(0.075)
IO Short-term investors	1.097***			1.298***
* Manager delta	(0.257)			(0.263)
IO Mid-term investors		−0.011		−0.001
		(0.072)		(0.061)
IO Mid-term investors		−0.016		−0.053
* Manager delta		(0.204)		(0.207)
IO Long-term investors			0.363***	0.176**
			(0.085)	(0.083)
IO Long-term investors			0.044	0.066
* Manager delta			(0.277)	(0.283)
Profitability	0.958***	0.987***	0.927***	0.928***
	(0.067)	(0.068)	(0.067)	(0.068)
Tangibility	0.001	0.000	−0.004	−0.003
	(0.019)	(0.019)	(0.019)	(0.019)
Q	−0.085***	−0.088***	−0.083***	−0.083***
	(0.006)	(0.006)	(0.006)	(0.006)
Leverage	−0.154***	−0.172***	−0.155***	−0.149***
	(0.034)	(0.034)	(0.034)	(0.034)
Firm size	−0.119***	−0.116***	−0.121***	−0.122***
	(0.004)	(0.004)	(0.004)	(0.004)
Z-score<1.81	0.036*	0.025	0.031	0.036*
	(0.019)	(0.020)	(0.019)	(0.019)
Year effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Observations	9,167	9,167	9,167	9,167

[11] In unreported tests, we use *Manager vega* as a robustness measure and find similar results.

Table 5
Motivated investors, institutional investor horizons and bank debt.
Reported are Tobit estimations of the effects of motivated investors on the relation between institutional shareholder investment horizons and the use of bank debt. The dependent variable is the *Bank debt percent*, defined as total bank debt divided by total debt, where bank debt is the sum of term loans and revolving credit. Models 1 through 4 report results where motivated investors is proxied by *Percent motivated shares*. *Percent motivated shares* is the percent of shares owned by motivated investors, as defined by Fich et al. (2015). In Model 5, *Percent motivated funds* is substituted as the measure for motivated investors. *Percent motivated funds* is the percent of institutions who are motivated investors, as defined by Fich et al. (2015). Detailed variable descriptions are provided in Appendix A. Tobit estimation methods are used controlling for industry and year fixed effects. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dep. Var: Bank debt percent					
	(1)	(2)	(3)	(4)	(5)
Motivated investor measure:	Percent motivated shares	Percent motivated shares	Percent motivated shares	Percent motivated shares	Percent motivated funds
IO	0.111***	0.044**	−0.066***		
	(0.017)	(0.021)	(0.017)		
Motivated	−0.595***	−0.656***	−0.240***	−0.514***	−0.091
	(0.045)	(0.059)	(0.057)	(0.075)	(0.183)
IO Short-term investors	−0.546***			−0.455***	−0.391***
	(0.047)			(0.046)	(0.048)
IO Short-term investors * Motivated	0.980***			1.080***	0.749**
	(0.137)			(0.164)	(0.348)
IO Mid-term investors		−0.161***		−0.095***	−0.080**
		(0.041)		(0.036)	(0.035)
IO Mid-term investors * Motivated		0.794***		0.584***	−0.256
		(0.128)		(0.157)	(0.586)
IO Long-term investors			0.288***	0.476***	0.362***
			(0.052)	(0.049)	(0.047)
IO Long-term investors * Motivated			−0.324*	−1.257***	−5.038***
			(0.191)	(0.208)	(0.702)
Profitability	0.506***	0.513***	0.501***	0.503***	0.508***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Tangibility	0.021*	0.029**	0.033***	0.018	0.017
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Q	−0.049***	−0.052***	−0.053***	−0.048***	−0.048***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Leverage	−0.008	−0.016	−0.012	−0.007	−0.014
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
Firm size	−0.055***	−0.055***	−0.061***	−0.055***	−0.054***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Z-score<1.81	−0.046***	−0.052***	−0.046***	−0.048***	−0.046***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Year effects	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes
Observations	22,943	22,943	22,943	22,943	22,943

from bank monitoring, so the avoidance of (reliance on) bank debt from short-term (long-term) investors is mitigated. These results strengthen the main findings that short-term (long-term) investors avoid (benefit from) banking monitoring.

5. Robustness tests

5.1. Endogeneity concerns

The baseline regression estimates reported in Table 2 indicate that long-term investors and short-term investors have notably different attitudes toward bank debt. However, these results could be biased if the percentage of bank debt determines investor horizons of a firm or if both investor horizons and the percentage of bank debt are driven by some omitted and unobservable variables. Related, a potential bias is likely if a dynamic relation exists between the percentage of bank debt and the explanatory variables. To address these potential concerns, we split the overall horizon measures into those of quasi-indexers and non-quasi-indexers. We also employ change regressions, two-stage least square estimations methods, and dynamic GMM estimations.

5.1.1. Quasi-indexers vs. non-quasi-indexers

Harford et al. (2018) suggest that splitting investor horizon variables into quai-indexer horizon variables and non-quasi-indexer horizon variables provides a useful identification strategy. Although the literature shows that quasi-indexers impact various corporate policies (Appel et al., 2016; Boone and White, 2015), they are exogenous to debt decisions because their portfolio composition is largely determined by the constituents of their relative benchmark index. We therefore re-run our baseline tests in Table 2 replacing *IO* with *IO Quasi-indexers* and *IO Non-quasi-indexers,* replacing *IO Short-term investors* with *IO Short-term quasi-indexers* and *IO Short-term non-quasi-indexers*, replacing *IO Mid-term investors* with *IO Mid-term quasi-indexers* and *IO Mid-term non-quasi-indexers*, and replacing *IO Long-term investors* with *IO Long-term quasi-indexers* and *IO Long-term non-quasi-indexers*. To provide robustness, we also substitute *Turnover* with *Turnover (Quasi-indexers)* and *Turnover (Non-quasi-indexers).*[12] The results are reported in Table 6.

The coefficient of *IO Quasi-indexers* is positive and significant in all but one model, whereas the coefficient of *IO Non-quasi-indexers* is negative and significant in all models. This suggests that quasi-indexers (non-quasi-indexers) in general welcome (avoid) bank

[12] We distinguish quasi-indexers and non-quasi-indexers based on the percentage of active shares (Cremers and Petajisto, 2009). Active shares measures the total distance between the weights of firms in an institution's portfolio and the weights of firms in the CRSP value-weighted index. An institution with less than 25% of active shares is classified as a quasi-indexer, otherwise it is a non-quasi-indexer. This methodology is consistent with Harford et al. (2018).

Table 6
Quasi-indexers vs. Non-Quasi-indexers.
This table reports the regression results from estimating the effects of quasi-indexers' and non-quasi-indexers' shareholder investment horizons on the use of bank debt for the sample of 22,943 firm-year observations during the period from 1990 to 2015. The dependent variable is the ratio of bank debt to total debt. Model 1 (2, 3) reports the results when the effect of short-term (mid-term, long-term) shareholder ownership of quasi-indexers and non-quasi-indexers is studied, and Model 4 reports the results when the joint effects of all six investment horizon measures are investigated. In Model 5 we use a single firm turnover ratio measure of quasi-indexers and turnover ratio measure of non-quasi-indexers to provide robustness. We define short-term (mid-term/long-term) investors as investors that have the average portfolio churn rate in the top (middle/bottom) tercile. Detailed variable descriptions are provided in Appendix A. Tobit estimation methods are used controlling for industry and year fixed effects. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dep. Var: Bank debt percent					
	(1)	(2)	(3)	(4)	(5)
IO Quasi-indexers	0.284***	0.078*	0.050		0.190***
	(0.034)	(0.043)	(0.034)		(0.031)
IO Non-quasi-indexers	−0.190***	−0.281***	−0.256***		−0.183***
	(0.021)	(0.031)	(0.021)		(0.016)
IO Short-term quasi-indexers	−0.653***			−0.356***	
	(0.078)			(0.067)	
IO Short-term non-quasi-indexers	−0.133**			−0.319***	
	(0.060)			(0.046)	
IO Mid-term quasi-indexers		0.118*		0.207***	
		(0.064)		(0.044)	
IO Mid-term non-quasi-indexers		0.096		−0.183***	
		(0.059)		(0.034)	
IO Long-term quasi-indexers			0.375***	0.422***	
			(0.075)	(0.065)	
IO Long-term non-quasi-indexers			0.089	−0.193***	
			(0.060)	(0.047)	
Turnover (Quasi-indexers)					−0.279***
					(0.047)
Turnover (Non-quasi-indexers)					−0.067
					(0.068)
Profitability	0.543***	0.551***	0.547***	0.542***	0.531***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.027)
Tangibility	−0.005	−0.000	−0.000	−0.004	0.012
	(0.010)	(0.010)	(0.010)	(0.010)	(0.012)
Q	−0.060***	−0.062***	−0.061***	−0.061***	−0.066***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Leverage	0.018	0.014	0.013	0.018	0.012
	(0.022)	(0.022)	(0.022)	(0.022)	(0.025)
Firm size	−0.070***	−0.069***	−0.070***	−0.071***	−0.069***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Z-score<1.81	−0.047***	−0.052***	−0.053***	−0.047***	−0.040***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.014)
Year effects	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes
Observations	22,943	22,943	22,943	22,943	19,975

debt. This result is consistent with our main findings because quasi-indexers tend to hold stocks longer than non-quasi-indexers.

More importantly, these split measures help examine the shareholder investment horizon effects of quasi-indexers and non-quasi-indexers. The coefficients of both *IO Short-term quasi-indexers* and *IO Short-term non-quasi-indexers* are negative and significant in Model 1. In Model 3, both coefficients of *IO Long-term quasi-indexers* and *IO Long-term non-quasi-indexers* are positive, although only *IO Long-term quasi-indexers* has a significant impact on bank debt. When we include holdings of all horizons in Model 4, we continue to find that short-term quasi-indexers reduce bank debt and long-term quasi-indexers increase bank debt. The negative impact of *IO Long, Mid, and Short-term non-quasi-indexers* in Model 4 is not surprising because these three variables capture the effects of total holdings by non-quasi-indexers when *IO Non-quasi-indexers* is not included in the model.

It is also interesting to note that even among these three variables, the magnitude of *IO Short-term non-quasi-indexers* is greater than the magnitude of *IO Long-term non-quasi-indexers*. The results are further strengthened in Model 5. The turnover ratio of quasi-indexers is negatively associated with the percentage of bank debt, whereas the coefficient of the turnover ratio of non-quasi-indexers is negative but insignificant. Taken together, the effects of quasi-indexer horizon measures (plausibly exogenous) are more significant than the effects of non-quasi-indexer horizon measures (plausibly endogenous). These quasi-indexer results alleviate the concerns that our baseline results are driven by reverse causality or selection biases.[13]

5.1.2. Change regressions

Because it is challenging, if not impossible, to find a perfect identification solution for endogenenity issues, we employ a variety of models. Regressing the change in bank debt percent on the changes in investor horizons and other dependent variables controls for the firm-specific omitted variables bias, provided that these variables are constant over time. We therefore require a firm to have at least two consecutive firm-year observations to calculate the change between two periods. This leads to a sample containing 18,484 firm-year observations. Untabulated test results provide support that our baseline regression estimates on the monitoring avoidance of short-term investors are not driven by omitted and unobservable variables.

[13] In untabulated tests, we classify quasi-indexers based on the institution type from Professor Brian Bushee's webpage at the Wharton School. Consistent with our baseline findings, we find that quasi-indexers and non-quasi-indexers have similar effects on bank debt.

5.1.3. Two-stage least squares estimations with Russell index reconstitutions

To further address endogeneity, we follow recent literature on Russell index reconstitution to employ the Russell 1000/2000 annual index reconstitution as an exogeneous shock on investment horizons. Schmidt and Fahlenbrach (2017) and Fich et al. (2015) use Russell 1000/2000 index switches as instrumental variables for the level of shareholder ownership. We adopt their methodology with an important difference: we use the Russell index switches as instruments for both ownership levels and shareholder investment horizons.

We posit that $R_{1000,i,t\text{-}1} \rightarrow R_{2000,i,t}$ companies will have longer investment horizons as reflected by lower turnover ratios post index reconstitution, while $R_{2000,i,t\text{-}1} \rightarrow R_{1000,i,t}$ companies will have shorter investment horizons as reflected by higher turnover ratios post index reconstitution. There are economic reasons to expect such relationships, which justify the relevance condition of index switches as valid instruments. Because Russell indexes are value weighted, a stock at the bottom of the Russell 1000 Index, which has a smaller market capitalization than most of the other companies in the Russell 1000, has much less weight than a stock at the top of the Russell 2000 Index, which has a larger market capitalization than most of the other companies in the Russell 2000.[14] Thus, a stock moving from the Russell 1000 Index to the Russell 2000 Index (from the Russell 2000 Index to the Russell 1000 Index) will be held much more (less) heavily by these index-tracking institutions after reconstitution (Schmidt and Fahlenbrach, 2017). Because these index-tracking institutions tend to be passive and long-term investors, passive investor losing $R_{2000,i,t\text{-}1} \rightarrow R_{1000,i,t}$ companies will have a decrease in shareholder horizons after reconstitution, and passive investor gaining $R_{1000,i,t\text{-}1} \rightarrow R_{2000,i,t}$ companies will see an increase in horizons.

We include three IVs by first constructing two dummy variables: $R_{2000,i,t\text{-}1} \rightarrow R_{1000,i,t}$ equals one for companies that switch from the Russell 2000 Index in year t-1 to the Russell 1000 Index in year t and $R_{1000,i,t\text{-}1} \rightarrow R_{2000,i,t}$ equals one for companies that switch from the Russell 1000 Index in year t-1 to the Russell 2000 Index in year t. However, because the switches in these Russell indexes are based upon market capitalization rank change, it is important for us to include the firms' May market capitalization rank change (($Rank_{i,t\text{-}1} \rightarrow Rank_{i,t}$) / *100* hereafter) to make index membership switches random (Schmidt and Fahlenbrach, 2017).[15] In this setting, three variables $R_{2000,i,t\text{-}1} \rightarrow R_{1000,i,t}$, $R_{1000,i,t\text{-}1} \rightarrow R_{2000,i,t}$, and ($Rank_{i,t\text{-}1} \rightarrow Rank_{i,t}$) / *100* consist of the index switches conditional on the change in market capitalization rank, which satisfy the exclusion restriction of these instrumental variables. We exclude observations after 2006 because beginning in 2007 Russell implemented a "banding" policy to minimize the number of stocks that switch indexes each year. This "banding" policy is not entirely based upon market capitalization, and it could possibly introduce noise in the otherwise clear rules of index reconstitution before 2006. Furthermore, following Bakke and Whited (2012), we only keep observations close to the Russell 1000/2000 cutoff, using 500 firms on either side of this cutoff. More specifically, we only include observations with Russell index information in both years t-1 and t (Schmidt and Fahlenbrach, 2017) and require that a firm's market capitalization rank is between 500 and 1500 in year t-1 to be in this 2SLS test sample. These restrictions reduce our sample size to 4,268.

The instrumental variable regressions are conducted in two stages. In the first stage, we regress each of the investment horizon variables (*IO Short-term investors, IO Mid-term investors, IO Long-term investors, and Turnover)* and ownership by all institutional investors *(IO)* on the three instrumental variables and the set of control variables shown in Eq. (6). In the second stage, we estimate Eq. (6), replacing the investor horizon variables with the predicted values of *IO* and the investor horizon variables obtained from the first stage. The regression results from the second stage are reported in Table 7, and they are generally consistent with our baseline results. *IO of Long-term Investors* has a positive effect on bank debt, and *Turnover* is negatively associated with bank debt. The coefficient of *IO of Short-term Investors* is negative and significant in Model 1, although it is not significant in Model 4. These results again support the causal impact of shareholder investment horizons on bank debt percent.

5.1.4. Two-stage least squares estimations with 2003 mutual fund scandal

We further address endogeneity concerns by using a natural experiment based on the mutual fund scandal that occurred in September 2003. In this scandal, 25 large mutual fund families were accused of illegal trading practices that included market timing and late trading in some of their funds. The scandal triggered massive capital outflow from implicated fund families (Kisin, 2011). We posit that capital outflow arising from the scandal provides an exogenous shock to institutional investors' horizons, and thus a natural experiment to address endogeneity. Following Anton and Polk (2014), we estimate 2SLS regressions using an IV approach. Specifically, we follow prior studies and take a subsample from 1999 to 2006 to include both pre-scandal and post-scandal periods. The instrumental variable, *RATIO_2003,09*, is equal to zero for the years before 2003, and is equal to the percentage of ownership of firm stocks held by implicated funds divided by total institutional ownership in the firm as of September 2003 (when the scandal became public) for observations beginning in 2003.[16]

The first stage results are shown in Models 1 through 4 of Table 8. The coefficient of *RATIO_2003,09* is positive and significant at the 1% level in Model 4, where *Turnover* ratio is used as the measure of overall shareholder investment horizons. This suggests that the proportional ownership held by the implicated funds reduces shareholder investment horizons. We further find that this negative relation between the scandal and horizons is due to the scandal's impact on the ownership of long-term institutions. Specifically, *RATIO_2003,09* in Model 3 has a significant and negative effect on *IO of Long-term investors*, whereas in Models 1 and 2 it has no significant effect on *IO of Short-term investors* or *IO of Mid-term investors*. Together, these results indicate that long-term institutions experienced significant outflow if they were involved in the mutual fund scandal, whereas mid-term institutions or short-term institutions were not significantly affected. As a result, the firm-level turnover ratio increases due to the loss of long-term investors, as shown in Model 4.

Because only the first stage results of *IO of Long-term investors* and *Turnover ratio* satisfy the relevance condition, we obtain the predicted values for these two measures and use them in the second stage, which are shown in Models 5 and 6 of Table 8. The results are robust and consistent with our main findings. The predicted value of long-term intuitional ownership increases bank debt percent, suggesting that long-term investors prefer bank debt for its monitoring effect. The predicted value of the turnover ratio is negatively associated with the use of bank debt. This supports

[14] Schmidt and Fahlenbrach (2017) find that market-capitalization-based weights of the lowest ranking members of the Russell 1000 are approximately ten times smaller than the weights of the highest ranked members of the Russell 2000.

[15] See Chang et al. (2015) for the detailed discussion of May market capitalization calculation.

[16] Data on the implicated fund families are obtained from Stanford Law School Securities Class Action Clearing House.

Table 7
Institutional investor horizons and bank debt: IV estimation.
This table reports second-stage regression results from two-stage least squares estimations. The dependent variable is the Bank debt percent. The predicted values of IO Short-term, IO Mid-term, and IO long-term investors are obtained from first-stage regressions, where each investment horizon variable is regressed on the set of controls and three instrumental variables: R2000,i,t-1 → R1000,i,t, R1000,i,t-1 → R2000,i,t, and the rank change of market capitalization. Detailed variable descriptions are provided in Appendix A and in the text. We control for industry and year fixed effects. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dep. Var: Bank debt percent					
	(1)	(2)	(3)	(4)	(5)
IO	0.999***	1.266*	0.334		0.775***
	(0.328)	(0.695)	(0.242)		(0.273)
IO Short-term Investors	−1.258**			0.409	
	(0.632)			(0.896)	
IO Mid-term Investors		−1.473		0.234	
		(1.274)		(0.806)	
IO Long-term Investors			1.196**	1.589**	
			(0.562)	(0.751)	
Turnover					−4.120**
					(2.068)
Profitability	0.494***	0.560***	0.468***	0.465***	0.457***
	(0.097)	(0.093)	(0.101)	(0.102)	(0.111)
Tangibility	−0.060**	−0.098***	−0.084***	−0.088**	−0.059**
	(0.026)	(0.031)	(0.025)	(0.034)	(0.028)
Q	−0.012	−0.012	−0.004	−0.003	−0.006
	(0.010)	(0.013)	(0.012)	(0.014)	(0.012)
Leverage	−0.323***	−0.391***	−0.312***	−0.307***	−0.325***
	(0.058)	(0.053)	(0.059)	(0.059)	(0.059)
Firm size	−0.015	−0.021*	−0.017	−0.017	−0.009
	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)
Z-score<1.81	0.092***	0.059**	0.077***	0.074***	0.112***
	(0.023)	(0.025)	(0.021)	(0.027)	(0.029)
Year effects	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes
Observations	4,268	4,268	4,268	4,268	4,268

Table 8
Institutional investor horizon and debt choice: IV estimation with mutual fund scandal.
This table reports regression results from two-stage least squares estimations, which use 2003 mutual fund scandal as an exogeneous shock. Models 1 to 4 show first stage results when we use horizon measures as the dependent variables. We use *Ratio_200,309* as the instrumental variable, which measure the percent of stocks held by institution involved in the mutual fund scandal at the end of September 2003. Second stage results are shown in Models 5 and 6 with *Bank debt percent* as the dependent variable. In Model 5, the key variable is the predicted value of *IO of Long-term Investors* obtained from Model 3. In Model 6, the key variable is the predicted value of firm level *Turnover* obtained from Model 4. Detailed variable descriptions are provided in Appendix A and in the text. We control for industry and year fixed effects. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dep. Var Stage	IO Short-term Investors First Stage (1)	IO Mid-term Investors First Stage (2)	IO Long-term Investors First Stage (3)	Turnover First Stage (4)	Bank debt percent Second Stage (5)	Bank debt percent Second Stage (6)
Ratio_200,309	0.024	−0.039	−0.156***	0.085***		
	(0.026)	(0.033)	(0.020)	(0.011)		
IO Long-term Investors (Predicted)					9.341***	
					(2.223)	
Turnover (Predicted)						−9.593***
						(2.733)
IO	0.286***	0.428***	0.200***	0.015***	0.889	−0.598***
	(0.003)	(0.004)	(0.003)	(0.002)	(0.569)	(0.085)
Profitability	0.004	0.017**	0.013**	−0.010***	0.815***	0.824***
	(0.006)	(0.007)	(0.006)	(0.004)	(0.112)	(0.113)
Tangibility	−0.022***	−0.014***	0.016***	−0.008***	0.444***	0.411***
	(0.003)	(0.003)	(0.003)	(0.002)	(0.069)	(0.061)
Q	0.007***	−0.003***	−0.002***	0.003***	−0.157***	−0.170***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.013)	(0.017)
Leverage	0.016***	−0.003	−0.005	0.007**	1.398***	1.364***
	(0.006)	(0.006)	(0.005)	(0.004)	(0.105)	(0.108)
Firm size	−0.004***	0.001	0.006***	−0.003***	0.062***	0.048***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.020)	(0.015)
Z-score<1.81	0.013***	−0.008**	−0.010***	0.008***	−0.380***	−0.389***
	(0.003)	(0.004)	(0.003)	(0.002)	(0.066)	(0.068)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	7,284	7,284	7,284	7,284	7,284	7,284

Table 9
Institutional investor horizons and bank debt: dynamic GMM.
Dynamic generalized method of moments (GMM) regression results estimating the effects of shareholder investment horizons on the use of bank debt for the period from 1990 through 2015 are reported. The dependent variable is the *Bank debt percent*. *AR(1)* and *AR(2)* are tests for first-order and second-order serial correlations in the first-differenced residuals, under the null of no serial correlation. The Hansen tests for over-identification are under the null that all instruments are valid. The Diff-in-Hansen tests of exogeneity are under the null that the instruments used for the equations in levels are exogenous. Detailed variable descriptions are provided in Appendix A. Tobit estimation methods are used controlling for industry and year fixed effects. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dep. Var: Bank debt percent				
	(1)	(2)	(3)	(4)
Bank debt percent (lag1)	0.798***	0.830***	0.780***	0.754***
	(0.262)	(0.255)	(0.301)	(0.239)
Bank debt percent (lag2)	0.078	0.097	0.113	0.093
	(0.208)	(0.231)	(0.222)	(0.198)
IO	0.205	0.055	−0.050	
	(0.152)	(0.100)	(0.091)	
IO Short-term investors	−0.340**			−0.119
	(0.141)			(0.095)
IO Mid-term investors		−0.144		0.037
		(0.108)		(0.098)
IO Long-term investors			0.302**	0.304**
			(0.122)	(0.122)
Profitability	−0.433	−0.521*	−0.470	−0.394
	(0.308)	(0.301)	(0.343)	(0.308)
Tangibility	−0.091	−0.082	−0.099	−0.089
	(0.110)	(0.118)	(0.110)	(0.107)
Q	0.046	0.067	0.049	0.048
	(0.042)	(0.041)	(0.047)	(0.043)
Leverage	−0.379***	−0.347**	−0.350**	−0.354***
	(0.132)	(0.140)	(0.138)	(0.133)
Firm size	−0.005	0.009	−0.004	−0.003
	(0.028)	(0.030)	(0.030)	(0.029)
Z-score<1.81	−0.002	−0.001	0.006	0.005
	(0.085)	(0.089)	(0.085)	(0.083)
Year effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Observations	11,990	11,990	11,990	11,990
AR(1) test (p-value)	0.035	0.045	0.076	0.029
AR(2) test (p-value)	0.902	0.868	0.803	0.838
Hansen over-identification (p-value)	0.428	0.377	0.500	0.474
Diff-in-Hansen exogeneity (p-value)	0.388	0.392	0.509	0.388

our baseline findings of a positive association between shareholder investment horizons and bank debt percent.

5.1.5. Dynamic GMM estimations

Wintoki et al. (2012) suggest that the dynamic panel generalized method of moments (GMM) provides a solution for both the dynamic relation between the dependent and explanatory variables and other endogeneity issues (Roberts and Whited, 2013). In our analysis, the dynamic nature of the variables could be a concern since it is possible that investment horizons are determined by a firm's past debt decisions and other firm characteristics. For example, current short-term (long-term) shareholders may be attracted by low (high) level of past bank debt. Following Wintoki et al. (2012), we use lagged one-year and lagged two-year measures of the bank debt percent to control for the dynamic relation, and lagged three-year and lagged four-year variables as instruments for endogenous variables, under the assumption that all the regressors except industry dummies and year dummies are endogenous.

Test results reported in Table 9 employing the dynamic GMM methodology are consistent with our baseline results. The coefficient of *IO Short-term investors* is negative in Models 1 and 4, and it is significant at the 5% level in Model 1. Also consistent with our initial findings *IO Long-term investors* has a significant and positive effect on the proportion of bank debt financing in both Models 3 and 4.

In addition, the AR(2) tests show that p-values range between 0.803 and 0.902, suggesting that the null hypothesis of no second-order serial correlation cannot be rejected. The Hansen J p-values range from 0.377 to 0.500, indicating that we cannot reject the null hypothesis that our instruments are valid. Furthermore, the range of p-values of the J-statistics produced by difference-in-Hansen is 0.388 to 0.509, which suggests that we cannot reject the null hypothesis that the subset of instruments from lagged differences used in the system GMM estimates are exogenous. In other words, the assumption that any correlation between our endogenous variables and the unobserved (fixed) effect is constant over time is valid, justifying the inclusion of levels equations in our GMM model and the use of lagged differences as instruments for these levels. Overall, the dynamic GMM test results indicate that after mitigating potential endogeneity issues, our baseline result that short-term (long-term) investors have a negative (positive) effect on the proportion of bank debt financing continues to hold.[17]

5.2. Alternative measures of shareholder investment horizons

In our baseline regressions we measure shareholder investment horizons as the ownership of short/mid/long-term institutional

[17] Due to the sensitivity of dynamic GMM to lag structure, we employ two alternative lag structures: (1) only lagged one-year measure of the bank debt ratio to control for the dynamic relation, with lagged two-year and lagged three-year variables as instruments for the endogenous variables; and (2) lagged one-year, two-year, and three-year measures of the bank debt ratio to control for the dynamic relation, with lagged four-year and lagged five-year variables as instruments for the endogenous variables. These findings reveal that while the choice of two lags gives us the most consistent estimation, our GMM results are robust to alternative lag structures.

investors, defined by the average churn rate of the institutional investors' overall portfolio of purchases and sales. Nevertheless, Alexander et al. (2007) argue that there is little information contained in investor-flow induced trading. We therefore utilize an alternative measure of institutional investor churn rate as discussed in Yan and Zhang (2009) to classify institutional investor horizons to minimize the influence of investor cash flows on portfolio turnover. Specifically, we re-calculate institutional investor *i*'s churn rate in quarter *t* ($Churn\ rate2_{i,t}$) in Eq. (3) using the minimum of aggregate purchases and sales rather than the sum of the two. The results are qualitatively unchanged and available upon request.

5.3. Firm size effect

Denis and Mihov (2003) find that public bond issuers and private bank/non-bank loan borrowers have distinct characteristics. Due to the time necessary for a company to gain the reputation needed to issue publicly traded debt (Diamond, 1991), and simple economies of scale, larger firms have better access to the public bond market, whereas smaller firms may out of necessity borrow solely from private lenders such as banks. Therefore, a natural question is whether the associations shown between shareholder investment horizons and bank debt financing hold for large firms, where it is legitimately a "decision" between bank debt and public debt.

To investigate this question we construct a subsample consisting only of large firms. Specifically, we partition firm-year observations with total assets greater than 100 million in 1990 U.S. dollars as our large-firm subsample that can access both public bond markets and private bank debt and re-estimate our baseline models. The untabulated test results are robust to examining only large firms.

5.4. Firm leverage

Because this study focuses on the bank debt percent, an alternative interpretation of our primary results is that instead of short-term investors discouraging the use of bank debt, it might be that short-term investors encourage the use of bonds. To distinguish these two possible effects, we test the impact of shareholder investment horizons on leverage. When a firm has greater holdings by short-term institutions, leverage should be lower if bank debt is avoided; however, leverage should be higher if short-term ownership encourages bond use. Unlike previous tests where we use lagged leverage as an independent variable, we here use the current year leverage as the dependent variable. The results are reported in Table 10.

The findings reveal that short-term ownership (long-term ownership) is significantly and negatively (positively) related to the leverage ratio. These results provide additional support that the negative association between short-term institutional ownership and bank debt is due to short-term investors' avoidance of bank monitoring, but not driven by the possibility that short-term investors encourage the use of bonds. On the other hand, long-term investors increase the use of bank debt as suggested by the increase in leverage.

Table 10
Institutional investor horizons and leverage.
Regression results are reported from estimates of the effect of institutional shareholder investment horizons on leverage for the period 1990 through 2015. The dependent variable is the *Book value of leverage*, measured as the ratio of sum of long-term debt and debt in current liabilities over total assets. Models 1, 2, and 3 examine the effect of *IO short-term*, *IO mid-term*, and *IO long-term investors*, respectively. Each horizon measures the ratio of ownership by short-term, mid-term, and long-term institutional investors divided by the total ownership outstanding. Short-term, mid-term, and long-term are categorized as those institutional investors with an overall portfolio turnover rate in the top, middle, and bottom tercile, respectively. Model 4 reports the joint effects for all three investment horizon measures. Detailed variable descriptions are provided in Appendix A. Tobit estimation methods are used controlling for industry and year fixed effects. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dep. Var: Leverage	(1)	(2)	(3)	(4)
IO	−0.220***	−0.345***	−0.275***	
	(0.072)	(0.069)	(0.064)	
IO Short-term investors	−0.447**			−0.693***
	(0.187)			(0.160)
IO Mid-term investors		0.126		−0.113
		(0.159)		(0.134)
IO Long-term investors			0.078*	0.087**
			(0.046)	(0.038)
Profitability	−0.056	−0.055	−0.048	−0.053
	(0.087)	(0.087)	(0.087)	(0.087)
Tangibility	0.432***	0.449***	0.449***	0.435***
	(0.058)	(0.057)	(0.057)	(0.058)
Q	−0.025**	−0.029***	−0.028***	−0.026**
	(0.010)	(0.010)	(0.010)	(0.010)
Firm size	0.280***	0.274***	0.282***	0.287***
	(0.015)	(0.015)	(0.015)	(0.016)
Z-score<1.81	0.461***	0.462***	0.455***	0.457***
	(0.064)	(0.064)	(0.064)	(0.064)
Industry effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Observations	22,915	22,915	22,915	22,915

6. Effects of shareholder investment horizons on other aspects of debt structure

6.1. Debt covenants

The literature establishes that covenants play an important role in creditor's monitoring activities (Aghion and Bolton, 1992; Dewatripont and Tirole, 1994). Covenants provide a shift of control rights to creditors to protect their interests outside of bankruptcy, and therefore, increase a creditor's incentive to actively monitor the borrower.

There are two potential forces determining the effects of horizons on debt covenants. On the one hand, the creditor may prefer to incorporate more covenants in a loan made to a firm with higher short-term investment ownership to enforce greater monitoring on the firm[18]; on the other hand, short-term investors may try to avoid the monitoring from the creditor by reducing the number of covenants imposed by the loan contract. Therefore, the effect of shareholder investment horizons on debt covenant inclusion is an empirical question.

We obtain covenant information on public bonds from the Mergent FISD database. Unlike the previous tests in this paper, where our observations are at the firm-year level, the effect of shareholder investment horizons on the covenant intensity of newly issue bonds is estimated at the issue level. Due to the count nature of the dependent variable, we employ Poisson regression methodology to estimate the effect of shareholder investment horizons on the inclusion of public bond covenants.[19]

The results are reported in Table 11. We find that short-term institutional ownership is negatively related with the number of covenants and long-term investors increase the number of covenants in public bond issues. This again indicates that short-term investors (long-term investors) avoid (welcome) monitoring.

[18] Short-term ownership could exacerbate shareholder-debtholder conflict. For example, Huang and Petkevich (2016) show that short-term ownership leads to higher cost of debt.

[19] In unreported tests, we use OLS methodology and the results are quantitatively similar.

Table 11
Shareholder investment horizons and debt covenants.
Regression results are reported from estimates of the effect of institutional shareholder investment horizons on debt covenants for the period 1990 through 2015. The dependent variable is the *Number of covenants* for a new debt issue. Models 1, 2, and 3 examine the effect of IO short-term, IO mid-term, and IO long-term investors, respectively. Each horizon measures the ratio of ownership by short-term, mid-term, and long-term institutional investors divided by the total ownership outstanding. Short-term, mid-term, and long-term are categorized as those institutional investors with an overall portfolio turnover rate in the top, middle, and bottom tercile, respectively. Model 4 reports the joint effects for all three investment horizon measures. Detailed variable descriptions are provided in Appendix A. Poisson estimation methods are used controlling for industry and year fixed effects. Robust standard errors are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dep. Var: Number of covenants				
	(1)	(2)	(3)	(4)
IO	0.410	1.323*	−0.866*	
	(0.554)	(0.684)	(0.504)	
IO Short-term investors	−2.804***			−1.338*
	(1.051)			(0.706)
IO Mid-term investors		−1.574		−0.540
		(1.108)		(0.920)
IO Long-term investors			4.166***	3.358***
			(1.138)	(1.026)
Profitability	6.421***	6.500***	6.203***	6.235***
	(0.840)	(0.837)	(0.840)	(0.841)
Tangibility	−0.972***	−0.994***	−0.998***	−1.009***
	(0.241)	(0.241)	(0.241)	(0.241)
Q	−0.994***	−0.983***	−0.979***	−0.979***
	(0.082)	(0.082)	(0.082)	(0.082)
Leverage	5.296***	5.239***	5.353***	5.330***
	(0.550)	(0.550)	(0.549)	(0.550)
Firm size	−0.526***	−0.507***	−0.575***	−0.572***
	(0.057)	(0.054)	(0.058)	(0.058)
Z-score<1.81	0.490*	0.454	0.549*	0.536*
	(0.284)	(0.283)	(0.283)	(0.284)
Industry effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Observations	3,001	3,001	3,001	3,001

6.2. Debt maturity

Stulz (2000) states that short-term debt can be a powerful monitoring tool, and Rajan and Winton (1995) show that short-term debt provides lenders the flexibility to effectively monitor with minimum effort. Moreover, bank debt tends to have shorter maturities and be more secured compared to public debt. Consistent with the findings of this study, short-term institutional shareholders with monitoring avoidance incentives should not only avoid bank debt, but they should prefer debt with longer maturity. Long-term shareholders, on the other hand, with preference for monitoring should use debt with shorter maturity. To test these conjectures, we calculate the proportion of debt maturing in greater than three years (*Debt maturity >3 years*) to measure a firm's debt maturity (Johnson, 2003) and the untabulated test results confirm our prediction.

6.3. Debt security

Flannery (1994) suggests that the use of secured debt involves an important set of agency problems between the borrower and the banker, who must diligently monitor the loan to maintain its value (Pennacchi, 1988). Rajan and Winton (1995) argue that collateral can be motivated as a contractual device to increase a lender's incentives to monitor. As such, secured lenders have greater incentives to monitor to improve overall efficiency. In untabulated tests, we find a negative (positive) association between short-term (long-term) institutional shareholder holdings and the use of secured debt, indicating that shareholders with short-term (long-term) investment horizons tend to use less (more) secured debt to avoid (improve) monitoring.

7. Conclusion

Previous literature highlights the relative benefits and costs of using bank debt as opposed to public debt. Other studies document the role that shareholder investment horizons play in determining corporate policy. An important economic question yet to be examined is the impact of shareholder investment horizons on a firm's use of bank debt. This research fills this void by examining the institutional shareholder investment horizons' effect on corporate debt decisions.

We find that the ownership of short-term institutional shareholders is negatively related to the proportion of debt financed through banks, supporting the bank monitoring avoidance hypothesis. This monitoring avoidance association is exacerbated by a firm's information opacity and weakened in the presence of high levels of managerial ownership and motivated investors. On the other hand, the proportion of debt financed through banks increases with the ownership of long-term institutional shareholders, supporting the bank monitoring reliance hypothesis for long-term investors. This association is likewise enhanced by firm's information opacity and reduced by incentivized managers and motivated investors. The negative association between leverage and shareholder investment horizons confirms the monitoring avoidance.

To test whether our results are subject to potential biases caused by endogeneity, we conduct a battery of robustness tests, including splitting quasi and non-quasi-indexers, change regressions, two-stage least square estimations with Russell reconstitutions, two-stage least square estimations with the 2003 mutual fund scandal, and dynamic GMM estimations. Our results remain intact after mitigating these endogeneity concerns.

Our results are also robust to the exclusion of small firms and to alternative investment horizon measures. Investigating the effects of institutional shareholder investment horizons on other aspects of debt, we find that firms with higher ownership by short-term shareholders use debt with few bond covenants, longer maturity, and less security. These results provide further evidence in support of our hypothesis that shareholders with short investment horizons are more likely to avoid external scrutiny and monitoring. Long-term shareholders, however, prefer external monitoring by using secure debt with shorter maturity and more covenants.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jbankfin.2019.105656.

Appendix A. Variable descriptions

Variable	Definition
Debt variables:	
Bank debt percent	Bank debt divided by total debt, where bank debt is the sum of term loans and revolving credit.
Public debt percent	Public debt divided by total debt, where public debt is the sum of senior bonds and notes, subordinated bonds and notes, and commercial paper.
Debt maturing >3 years	The proportional debt maturing beyond three years over total debt.
Secured debt	Total secured debt divided by total debt.
Debt covenants	The number of covenants in a newly issued debt.
Investment horizon variables:	
IO Short-term investors	The ratio of ownership by short-term institutional investors divided by total shares outstanding, where short-term institutional investors are defined as those with overall portfolio turnover rate in the top tercile.
IO Mid-term investors	The ratio of ownership by mid-term institutional investors divided by total shares outstanding, where mid-term institutional investors are defined as those with overall portfolio turnover rate in the middle tercile.
IO Long-term investors	The ratio of ownership by long-term institutional investors divided by total shares outstanding, where long-term institutional investors are defined as those with overall portfolio turnover rate in the bottom tercile.
IO Short-term investors2	Calculated similar to IO *Short-term investors*, but churn rate is calculated using the minimum of aggregate purchases and sales rather than the sum of the two.
IO Mid-term investors2	Calculated similar to IO *Mid-term investors*, but churn rate is calculated using the minimum of aggregate purchases and sales rather than the sum of the two.
IO Long-term investors2	Calculated similar to IO *Long-term investors*, but churn rate is calculated using the minimum of aggregate purchases and sales rather than the sum of the two.
Turnover	Firm-level weighted average churn rate by institutional investors.
Turnover2	Firm-level weighted average churn rate by institutional investors, calculated from institution level churn rate with the minimum of the aggregate purchase and sale rather than the sum of the two.
IO	The ratio of ownership by all institutional investors divided by total shares outstanding.
Motivated shares	Percent of shares owned by motivated investors as defined by Fich et al. (2015).
Motivated funds	Percent of institutions who are motivated investors as defined by Fich et al. (2015).
Firm Characteristic variables:	
Profitability	Earnings before interest, taxes, depreciation, and amortization (EBITDA) divided by total assets.
Tangibility	Gross property, plant, and equipment divided by total assets.
Q	Market value of equity plus book value of debt divided by total assets.
Leverage	The ratio of sum of long-term debt and debt in current liabilities over total assets.
Firm size	The natural logarithm of total assets measured in millions of US dollars.
Z-score<1.81	A dummy variable takes the value of one if Altman-Z score is less than 1.81 and zero otherwise. Altman's (1968) Z score is calculated as 1.2 * working capital+1.4 * retained earnings +3.3 * earnings before interest and taxes + 0.999* sales/total assets + 0.6 * (market value of equity/book value of debt).
Manager delta	CEO wealth change with regard to 1% stock price change / (salary + bonus + CEO wealth change with regard to 1% stock price change).
Number of analysts	Total number of stock analysts following the firm.
Abnormal accruals	Unsigned abnormal accruals computed using Jones model (Jones, 1991) as modified by Dechow et al. (1995).

References

Aghion, P., Bolton, P., 1992. An incomplete contracts approach to financial contracting. Rev. Econ. Stud. 59, 473–494.
Alexander, G.J., Cici, G., Gibson, S., 2007. Does motivation matter when assessing trade performance? An analysis of mutual funds. Rev. Financ. Stud. 20, 125–150.
Anton, M., Polk, C., 2014. Connected stocks. J. Financ. 69, 1099–1127.
Appel, I.R., Gormley, T.A., Keim, D.B., 2016. Passive investors, not passive owners. J. Financ. Econ. 121, 111–141.
Baghdadi, A., Bhatti, I., Nguyen, L., Podolski, E., 2018. Skill or effort? institutional ownership and managerial efficiency. J. Bank. Financ. 91, 19–33.
Bakke, T., Whited, T., 2012. Threshold events and identification: A study of cash shortfalls. J. Financ. 68, 1083–1111.
Bharath, S.T., Sunder, J., Sunder, S.V., 2008. Accounting quality and debt contracting. Account. Rev. 83, 1–28.
Billett, M., King, T., Mauer, D., 2007. Growth opportunities and the choice of leverage, debt maturity, and covenants. J. Financ. 62, 697–730.
Blume, M., Keim, D., 2017. The changing nature of institutional stock investing. Crit. Financ. Rev. 6, 1–41.
Bolton, P., Scharfstein, D., 1996. Optimal debt contracts and the number of creditors. J. Polit. Econ. 104, 1–25.
Boone, A., White, J.T., 2015. The effect of institutional ownership on firm transparency and information production. J. Financ. Econ. 117, 508–533.
Booth, J.R., 1992. Contract costs, bank loans, and the cross-monitoring hypothesis. J. Financ. Econ. 31, 25–41.
Boyd, J., Prescott, E., 1986. Financial intermediary coalitions. J. Econ. Theory 38, 211–232.
Bradley, M., Roberts, M.R., 2015. The structure and pricing of corporate debt covenants. Q. J. Finance 5, 1–37.
Bushee, B., 1998. The influence of institutional investors on myopic r&d investment behavior. Account. Rev. 73, 305–333.
Bushee, B., 2001. Do institutional investors prefer near-term earnings over long-run value? Contemp. Account. Res. 18, 207–246.
Cadman, B., Sunder, J., 2014. Investor horizon and ceo horizon incentives. Account. Rev. 89, 1299–1328.
Cantillo, M., Wright, J., 2000. How do firms choose their lenders? an empirical investigation. Rev. Financ. Stud. 13, 155–189.
Chang, Y.C., Hong, H., Liskovich, I., 2015. Regression discontinuity and the price effects of stock market indexing. Rev. Financ. Stud. 28, 212–246.
Chen, X., Cheng, Q., Lo, A.K., 2013. Accounting restatements and external financing choices. Contemp. Account. Res. 30, 750–779.
Chen, X., Harford, J., Li, K., 2007. Monitoring: Which institutions matter? J. Financ. Econ. 86, 279–305.
Chemmanur, T., Fulghieri, P., 1994. Reputation, renegotiation, and the choice between bank loans and publicly traded debt. Rev. Financ. Stud. 7, 475–506.
Core, J., Guay, W., 2002. Estimating the value of employee stock option portfolios and their sensitivities to price and volatility. J. Account. Res. 40, 613–630.
Cremers, M., Petajisto, A., 2009. How active is your fund manager? A new measure that predicts performance. Rev. Financ. Stud. 22, 3329–3365.
Datta, S., Iskandar-Datta, M., Patel, A., 1999. Bank monitoring and the pricing of corporate public debt. J. Financ. Econ. 51, 435–449.
Datta, S., Iskandar-Datta, M., Raman, K., 2005. Managerial stock ownership and the maturity structure of corporate debt. J. Financ. 60, 2333–2350.
Dechow, P.M., Sloan, R.G., Sweeney, A.P., 1995. Detecting earnings management. Account. Rev. 70, 193–225.
Denis, D., Mihov, V., 2003. The choice among bank debt, non-bank private debt, and public debt: Evidence from new corporate borrowings. J. Financ. Econ. 70, 3–28.
Derrien, F., Kecskés, A., Thesmar, D., 2013. Investor horizons and corporate policies. J. Financ. Quant. Anal. 48, 1755–1780.
Dewatripont, M., Tirole, J., 1994. A theory of debt and equity: Diversity of securities and manager-shareholder congruence. Q. J. Econ. 109, 1027–1054.
Diamond, D., 1984. Financial intermediation and delegated monitoring. Rev. Econ. Stud. 51, 393–414.
Diamond, D., 1991. Monitoring and reputation: The choice between bank loans and directly placed debt. J. Polit. Econ. 99, 689–721.
Dow, J., Gorton, G., 1997. Stock market efficiency and economic efficiency: Is there a connection? J. Financ. 52, 1087–1129.
Edelen, R.M., 1999. Investor flows and the assessed performance of open-end mutual funds. J. Financ. Econ. 53, 439–466.

Edmans, A., 2009. Blockholder trading, market efficiency, and managerial myopia. J. Financ. 64, 2481–2513.
Edmans, A., Manso, G., 2011. Governance through trading and intervention: A theory of multiple blockholders. Rev. Financ. Stud. 24, 2395–2428.
Elyasiani, E., Jia, J., Mao, C.X., 2010. Institutional ownership stability and the cost of debt. J. Financ. Mark. 13, 475–500.
Esty, B., Megginson, W., 2003. Creditor rights, enforcement and debt ownership structure: evidence from the global syndicated loan market. J. Financ. Quant. Anal. 38, 37–59.
Fama, E., 1985. What's different about banks? J. Monet. Econ. 15, 29–39.
Ferreira, M., Matos, P., Pereira, J., Pires, P., 2017. Do locals know better? A comparison of the performance of local and foreign institutional investors. J. Bank. Financ. 82, 151–164.
Fich, E.M., Harford, J., Tran, A.L., 2015. Motivated monitors: the importance of institutional investors' portfolio weights. J. Financ. Econ. 118, 21–48.
Flannery, M., 1994. Debt maturity and deadweight cost of leverage: Optimally financing banking firms. Am. Econ. Rev. 84, 320–331.
Fu, X., Kong, L., Tang, T., Yan, X., 2019. Insider trading and shareholder investment 1061 horizons. J. Corp. Financ. forthcoming.
Fu, X., Ligon, J.A., 2010. Exercises of executive stock options on the vesting date. Financ. Manag. 39, 1097–1126.
Gaspar, J., Massa, M., Matos, P., 2005. Shareholder investment horizons and the market for corporate control. J. Financ. Econ. 76, 135–165.
Gaspar, J., Massa, M., Matos, P., Patgiri, R., Rehman, Z., 2013. Payout policy choices and shareholder investment horizons. Rev. Financ. 17, 261–320.
Gertner, R., Scharfstein, D., 1991. A theory of workouts and the effects of reorganization law. J. Financ. 46, 1189–1222.
Harford, J., Kecskés, A., Mansi, S., 2018. Do long-term investors improve corporate decision making? J. Corp. Financ. 50, 424–452.
Hasan, I., Hoi, C.K., Wu, Q., Zhang, H., 2014. Beauty is in the eye of the beholder: the effect of corporate tax avoidance on the cost of bank loans. J. Financ. Econ. 113, 109–130.
Hasan, I., Hoi, C.K., Wu, Q., Zhang, H., 2017. Social capital and debt contracting: evidence from bank loans and public bonds. J. Financ. Quant. Anal. 52, 1017–1047.
Hirschman, A.O., 1970. Exit, Voice, and Loyalty: Responses to Decline in Firms. Harvard University Press, Cambridge, MA Organizations and States.
Hotchkiss, E.S., Strickland, D., 2003. Does shareholder composition matter? evidence from the market reaction to corporate earnings announcements. J. Financ. 58, 1469–1498.
Houston, J., James, C., 1996. Bank information monopolies and the mix of private and public debt claims. J. Financ. 51, 1863–1889.
Huang, K., Petkevich, A., 2016. Corporate bond pricing and ownership heterogeneity. J. Corp. Financ. 36, 54–74.
Jensen, M.C., Murphy, K.J., 1990. Performance pay and top-management incentives. J. Polit. Econ. 98, 225–264.
Jones, J., 1991. Earnings management during import relief investigations. J. Account. Res. 29, 193–228.
Johnson, S., 2003. Debt maturity and the effects of growth opportunities and liquidity risk on leverage. Rev. Financ. Stud. 16, 209–236.
Kim, H., Kim, T., Kim, Y., Park, K., 2019. Do long-term institutional investors promote corporate social responsibility activities? J. Bank. Financ. 101, 256–269.
Kisin, R., 2011, "The impact of mutual fund ownership on corporate investment: evidence from a natural experiment", Working paper.
Krishnaswami, S., Spindt, P., Subramaniam, V., 1999. Information asymmetry, monitoring and the placement structure of corporate debt. J. Financ. Econ. 51, 407–434.
Leland, H.E., Pyle, D.H., 1977. Informational asymmetries, financial structure, and financial intermediation. J. Financ. 32, 371–387.
Lin, C., Ma, Y., Malatesta, P., Xuan, Y., 2012. Corporate ownership structure and bank loan syndicate structure. J. Financ. Econ. 104, 1–22.
Lin, C., Ma, Y., Malatesta, P., Xuan, Y., 2013. Corporate ownership structure and the choice between bank debt and public debt. J. Financ. Econ. 109, 513–534.
Masulis, R.W., Wang, C., Xie, F., 2009. Agency problems at dual-class companies. J. Financ. 64, 1697–1727.
Myers, S.C., 1977. Determinants of corporate borrowing. J. Financ. Econ. 5, 147–175.
Nagel, G., Qayyum, M.A., Roskelley, K.D., 2015. Do motivated institutional investors monitor firm payout and performance? J. Financ. Res. 38, 349–377.
Nash, R., Netter, J., Poulsen, A., 2003. Determinants of contractual relations between shareholders and bondholders: investment opportunities and restrictive covenants. J. Corp. Financ. 9, 201–232.
Park, C., 2000. Monitoring and structure of debt contracts. J. Financ. 55, 2157–2195.
Pennacchi, G., 1988. Loan sales and the cost of bank capital. J. Financ. 43, 375–396.
Porter, M., 1992. Capital choices: Changing the way america invests in industry. Cont. Bank J. Appl. Corp. Financ. 5, 4–16.
Prevost, A., Wongchoti, U., Marshall, B., 2016. Does institutional shareholder activism stimulate corporate information flow? J. Bank. Financ. 70, 105–117.
Rajan, R., 1992. Insiders and outsiders: The choice between informed and arm's-length debt. J. Financ. 47, 1367–1400.
Rajan, R., Winton, A., 1995. Covenants and collateral as incentives to monitor. J. Financ. 50, 1113–1146.
Roberts, M., Whited, T., 2012. Endogeneity in empirical corporate finance. Handbook of the Economics of Finance 2, 487–566. (Elsevier Science, Amsterdam).
Saunders, A., Song, K., 2018. Bank monitoring and CEO risk-taking incentives. J. Bank. Financ. 88, 225–240.
Scharfstein, D.S., Stein, J., 1990. Herd behavior and investment. Am. Econ. Rev. 80, 465–479.
Schmidt, C., Fahlenbrach, R., 2017. Do exogenous changes in passive institutional ownership affect corporate governance and firm value? J. Financ. Econ. 124, 285–306.
Shleifer, A., Vishny, R.W., 1997. The limits of arbitrage. J. Financ. 52, 35–55.
Stulz, R., 2000. Does Financial Structure Matter for Economic Growth? A Corporate Finance Perspective. Ohio State University Unpublished working paper.
Wintoki, M.B., Linck, J.S., Netter, J.M., 2012. Endogeneity and the dynamics of internal corporate governance. J. Financ. Econ. 105, 581–606.
Yan, X., Zhang, Z., 2009. Institutional investors and equity returns: Are short-term institutions better informed? Rev. Financ. Stud. 22, 893–924.
Yang, L., Goh, J., Chiyachantana, C., 2016. Valuation uncertainty, market sentiment and the informativeness of institutional trades. J. Bank. Financ. 72, 81–98.
Zhang, X., Zhou, S., 2018. Bond covenants and institutional blockholding. J. Bank. Financ. 96, 136–152.