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**PEER INFLUENCE IN SHARE REPURCHASES:
MANAGERIAL HERDING OR STRATEGIC REACTION?**

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2023

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**Peer Influence in Share Repurchases:
Managerial Herding or Strategic Reaction?**

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**A thesis submitted in partial fulfilment of the requirements for the degree
of Master of Philosophy**

April 2023

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ABSTRACT

Peer influence is prevalent in various contexts. The clustering of share repurchase announcements might also be caused by peer influence. This study tries to figure out whether there is peer influence in share repurchase announcements by using the identification strategy of instrument variable method based on peers' stock return shocks. The empirical results of the 2SLS regression show that the peer influence does exist in announcing share repurchases. Under peer influence, this paper further examines whether there is managerial herding behavior in repurchase announcements, which is defined as mimicking behavior without rational judgment. The finding of the firm's value decrease due to mimicking announcements suggests that managers do herd in announcing repurchases. In cross-sectional tests, the results show that the peer influence is less pronounced when managers have higher ability and when external monitoring is stronger, which supports the existence of managerial herding in repurchase announcements.

Keywords: Peer Influence, Herding, Share Repurchase

ACKNOWLEDGEMENT

I would like to express my heartfelt gratitude to all those who have supported and encouraged me throughout the journey of completing my MPhil thesis. Without their unwavering support, this accomplishment would not have been possible.

First and foremost, I extend my deepest appreciation to my supervisor, Prof. Nancy Lixin Su, for her invaluable guidance, mentorship, and expertise. Her patience, dedication, and constant encouragement have been instrumental in shaping my research and refining my thesis. I am truly grateful for her unwavering support and for pushing me to strive for excellence. I also very appreciate her caring of my emotions and feelings in real life which gives me strong power and confidence to overcome any difficulty I encountered in research and real life.

I thank Dr. Jing Zhao, Prof. Jeffrey Ng and my co-supervisor Prof. Jungmin Kim for their support and guidance on this MPhil Thesis. Their valuable comments help a lot in improving the thesis. I am also indebted to all the teachers and faculty members in School of Accounting and Finance for their insightful lectures, constructive feedback, and academic guidance. Their profound knowledge and passion for teaching have enriched my understanding of the subject matter and have contributed significantly to my research.

I would also like to extend my sincere thanks to my friends and colleagues who have provided me with their support, encouragement, and motivation throughout this academic journey. Their friendship, camaraderie, and positive energy have made this experience truly memorable.

Last but not least, I would like to express my heartfelt appreciation to my beloved family for their unconditional love and constant encouragement. Their belief in me, their sacrifices, and their unwavering support have been the driving force behind my success.

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1. Introduction

According to economic theory, the occurrence of peer influence manifests across diverse contexts, wherein the collective behavior of a group significantly impacts the conduct of individual members within the group (Manski 1993).

Firms' share repurchase announcements tend to occur in a clustering way or happen in waves (Wang et al. 2009; Dittmar and Dittmar 2008). In addition to the common effect, peer influence may contribute to the clustering phenomenon of share repurchases (Adhikari and Agrawal 2018). To respond to peers' repurchase announcements, managers might strategically react to peers' announcements (Massa et al. 2007), or just mimic peers' announcements without rational independent judgment for just conforming to the majority. The latter mimicking behavior is defined as managerial herding in this paper and this study aims to examine whether managers herd in making share repurchase announcements.

The occurrence of corporate share repurchase clustering is a widely recognized phenomenon in the financial market (Wang et al. 2009). For instance, during the crisis on October 19, 1987, experienced by the New York Exchange, 650 firms announced their share repurchase programs in the subsequent week. Additionally, in 2021, several major Chinese internet companies, including Alibaba, Tencent, and Xiaomi, announced share repurchase programs following a significant downturn in stock prices, serving as more recent anecdotal evidence.

It is logical to assume that when stock prices decline, firms would engage in share repurchases as a means to signal undervaluation and safeguard share prices (Grullon and Michaely 2004). However, not all firms possess the awareness or capacity to execute share repurchases, and this strategy may not be optimal for every firm. Consequently, the clustering of managers' share repurchases could be attributed to peer influence, where a firm's decision to announce share repurchases may be prompted by the announcements made by its peers.

In line with the objective of this study, an examination is conducted to ascertain the presence of peer influence in share repurchase announcements. It is anticipated that if peer influence does exist, there would be a positive relationship between a firm's likelihood of announcing a share repurchase and the probability of share repurchase announcements made by its peers. Drawing from the approach employed by Seo (2021), an ordinary least squares (OLS) regression model is utilized, wherein the focal firm's share repurchase announcement is regressed against the percentage of its peers announcing share repurchases. The findings of this regression analysis reveal a significant and positively signed coefficient of interest, aligning with the initial expectation. However, it is important to acknowledge the potential endogeneity issue inherent in this regression. The observed positive association in the regression results may be attributable to shared underlying factors that impact all firms within the industry or the broader economy, such as a substantial market downturn.

To address the endogeneity problem and to further demonstrate that the clustering of share repurchase announcements is attributable to peer influence, I use an identification strategy of instrument variable method based on peers' stock return shocks, following Leary and Roberts (2014). This instrument variable measures the abnormal return of the peers in the previous quarter, which is calculated by using the raw return minus the expected return based on an asset pricing model that includes the market and industry risk factors. The peers' prior idiosyncratic stock return has a negative relation with peers' current share repurchase announcements, because when the peers' stocks are undervalued they would utilize share repurchase policy to signal stock undervaluation. However, as the instrument variable excludes the common market and industry factors, the peers' prior idiosyncratic stock return shocks should be exogenous to a focal firm's decision-making. Thus, as the common effect is isolated by the instrument variable, if there is peer influence in repurchase announcements, I expect that the positive

association between a focal firm's announcement and its peers' announcements still exists by using this instrument variable.

In the empirical results of the 2SLS regression, I still find a positive and significant (although less statistically) coefficient of the instrumented peers' share repurchase announcements, which indicates that managers indeed are influenced by peers in announcing share repurchases. Also, this peer influence finding in the 2SLS regression is not likely coming from learning information of peers. Because the instrument variable is idiosyncratic to the peers, and the peers' repurchase announcements predicted by this instrument are made based on peers' specific characteristics which should not contain useful information for a focal firm.

The peer influence might come from managers strategically reacting to peers' repurchase announcements. Peers' repurchase announcements generate a positive signal of their performance and financial health but a negative signal of their competitors in the same industry. A repurchase announcement increases the stock price of the repurchasing firm but decreases the stock price of the peer firms in the same industry (Massa et al. 2007). To avoid the negative impact, managers might strategically react to peers' repurchase announcements by making following announcements. This following behavior is made based on managers' rational judgment and with purpose to improve firm performance. Consequently, the repurchase announcements due to managers' strategic reaction should increase firm value.

Alternatively, managers might herd with peers' repurchase announcements without independent thinking. Because share repurchase policy is not an easy decision for managers. It has both benefits and costs to balance. For instance, share repurchase can enhance shareholder value (Comment and Jarrell 1995), reduce capital gain tax (Asquith and Mullins Jr 1986), signal stock undervaluation (Grullon and Michaely 2004), and provide flexibility in capital structure (DeAngelo et al. 2006). But it can also cause problems including misallocation of

resources (Brav et al. 2005), market timing risks (Baker and Wurgler 2002), agency costs and insider trading (Jagannathan et al. 2000), and reduced financial flexibility (Grullon and Michaely 2002). When managers have difficulty in making repurchase decisions, managers may just conform with the majority and herd with peers to announce repurchases. According to social proof theory, individuals tend to rely on the actions of others when they are uncertain about what to do (Cialdini and Cialdini 2007). Managers may feel that if their peers are making certain decisions or following a particular strategy, it must be the correct course of action. As this mimicking behavior is not based on any rational judgment or independent decision-making, it should not generate value for the firm or even reduce firm's value.

To investigate whether managers herd in announcing share repurchases, I test whether managers' mimicking repurchase announcements increase firm value. I measure firm value by using firms' Tobin's Q which is a financial ratio that is often used in prior empirical research to examine the valuation of the firm (Bartov and Bodnar 1994; Rajan and Zingales 1998). I find that a firm's Tobin's Q decreased in the repurchase announcement quarter when many of the firm's peers also announced repurchases in that quarter. However, a firm's Tobin's Q increased in the repurchase announcement quarter when none of the firm's peers announced repurchase in that quarter. As a firm's repurchase announcement is more likely influenced by peers when a large proportion of peers also announced repurchases, the finding in the valuation analysis shows that the announcement due to peer influence reduces a firm's value, which indicates that managers herd with peers when peers announced repurchases.

To further examine the existence of managerial herding, I test whether managerial ability matters in the peer influence of repurchase announcements. Managers with higher ability are more capable to utilize strategies to react to peers' actions and are less likely to conduct irrational behavior such as herding. Hence, I expect that the peer influence is more pronounced

for managers with lower managerial ability if managerial herding exists in repurchase announcements. Following Demerjian et al. (2012), I measure managerial ability based on MA-Score developed and made public on their website. The empirical results in this cross-sectional test show that the coefficient of interest is more significant in the subsample of managers with lower managerial ability in the 2SLS regressions, which confirms that the peer influence is more pronounced for managers with lower managerial ability. This finding supports that managers indeed herd with peers in announcing share repurchases.

To provide more evidence of the existence of managerial herding, I also investigate whether managers' mimicking repurchase announcements are influenced by institutional investors' monitoring. When institutional investors have more monitoring effect on the firm, the agency problem will be reduced and managers' irrational conducts, such as herding, are more likely vetoed by institutional investors in boardroom (Black and Kim 2012). Also, institutional investors have professional expertise and market knowledge which will help managers build reaction strategies to peers' actions and mitigate irrational behaviors. Therefore, I expect that firms with higher institutional ownership concentration are less likely to herd in repurchase announcements, as higher concentration increases institutional investors' monitoring effect and corporate influence on the firm (Dharwadkar et al. 2008). The empirical results of the 2SLS regression under the subsample test indeed show that the relation between a firm's share repurchase announcement and its peers' announcements are less pronounced in the subsample of firms with higher institutional ownership concentration. These findings provide further evidence that managers herd in announcing share repurchases, and demonstrate that institutional investors' monitoring might reduce this managerial herding behavior.

In additional test, I examine whether financial constraints could mitigate managers' herding behavior in announcing share repurchases. The share repurchase policy requires the support of

sufficient financing resources. Financially constrained firms especially lack financial resources, which will limit managers' potential to announce repurchases by herding with peers. The empirical results prove that managers are less likely to herd when they face financial constraints. These findings indicate that financial constraints could work well in mitigating managers' irrational behavior of herding in repurchase announcements.

In prior empirical tests, the peers' announcements are made in the same quarter as the focal firm's announcement, which raises the concern that the focal firm's announcement is not made by following peers but made ahead of peers' announcements. To address this concern, I conduct lead-lag analysis of the peer influence in repurchase announcements as robustness test. In this test, I regress a firm's announcement on its peers' announcements made in the prior quarter instead of the current quarter. In both OLS and 2SLS regressions by using the instrument variable, I still find a positive relation between a firm's announcement and the probability of peers announcing repurchases in the prior quarter, which confirms the argument that managers mimic with peers and the peer influence actually exists in repurchase announcements.

Overall, this paper examines whether peer influence exists in share repurchases and whether managers herd in making share repurchase announcements. Based on the identification strategy by using an instrument variable, I exclude the potential common effect underlying the clustering of repurchase announcements and prove the existence of peer influence. And based on the finding that the mimicking announcements decrease firms' value, I provide evidence that managers do herd with peers to announce repurchases. And this argument is further supported by the findings that managerial ability and institutional investors' monitoring can mitigate the peer influence.

This paper contributes to the literature on the peer influence in share repurchases. Prior literature on the clustering of share repurchases yield mixed results. Massa et al. (2007) highlight that firms operating in concentrated industries tend to mimic their peers by engaging in share repurchases. This strategic behavior aims to counteract the negative impact arising from their peers' share repurchase activities on their stock market performance. Similarly, Adhikari and Agrawal (2018) demonstrate the presence of a peer effect in firms' share repurchase policies. They reveal that firms emulate their peers' actions, particularly in response to competition within the industry. However, the study of Grennan (2019) presents a contrasting perspective, as it finds no significant peer effect in share repurchases. The analysis shows that a firm's decision to change its share repurchase activities is unrelated to the changes in share repurchases made by its peers. This paper adds to previous literature by showing that managers do herd in announcing share repurchases through a rich set of analyses, which gives more evidence supporting the existence of peer influence in repurchase announcements. In addition to the existence of peer influence, the impact of the peer influence on firms' valuation is less investigated in prior studies. This study also adds to this literature by conducting a valuation analysis and showing that the mimicking repurchase announcements due to peer influence can decrease firm value, which also supports the managerial herding behavior.

This study also contributes to the literature on herding behavior. Herding behavior is often defined as general mimicking behavior in prior literature. Many studies examine the underlying mechanisms of various mimicking behavior, such as information cascade, reputation competition, and other strategic reaction (Tse and Tucker 2009). Those studies try to find the rational reasons behind different mimicking behaviors. While, the mimicking behavior without underlying mechanism and rational judgment, which is the definition of herding in this paper, is less explored in prior literature. This paper adds to this literature by providing evidence that

managers could herd with peers without rational reasons and just to conform with the majority, which can decrease firm value.

Finally, this study may also contribute to the literature on agency problem of managerial herding. Managers are found to herd with peers in making corporate policy decisions, such as corporate disclosures (Tse and Tucker 2009; Shi et al. 2021; Brown et al. 2006) and CSR policies (Nofsinger et al. 2022). This study adds to this stream of literature by showing that managers also herd in announcing share repurchase which is a corporate payout policy. In addition, the consequence of managers' mimicking behavior is less examined in prior studies. This study demonstrates that the managerial herding behavior could be made without based on rational decisions which will reduce firm value, leading to agency problems. And I also find that managerial ability and external monitoring can mitigate this herding behavior.

The rest of this study is organized as follows. Section 2 introduces the motivation of research questions and section 3 describes the literature on herding and share repurchase. Section 4 shows the empirical methodology. Section 5 illustrates the statistics of data and testing samples. Section 6 shows the empirical results and the paper is concluded in section 7.

2. Motivation

Peer influence is prevalent in various contexts (Manski 1993), including the capital market. Institutional investors are found to follow their peers in making investment decisions (Sias 2004). Analysts are found to follow peers in making recommendations, and the market recognizes the mimicking behavior and has weaker reaction to revised recommendations close to the consensus (Jegadeesh and Kim 2009). Corporate managers, as one of the most important participants in the capital markets, are also found to follow their peers in making voluntary disclosures (Tse and Tucker 2009; Shi et al. 2021; Brown et al. 2006) and CSR policies (Nofsinger et al. 2022).

As the share repurchase announcements are found to occur in a clustering way and happen in waves (Wang et al. 2009; Dittmar and Dittmar 2008), which can be seen in Figure 2, the peer influence may also exist in the context of share repurchases. Although it is reasonable that common economic factors, such as a big stock price downturn, might cause the firms to announce share repurchases at the same time, the common effect might not be the only explanation of the clustering of repurchase announcements. Because not all firms have the consciousness or ability to conduct repurchases and repurchase might not be the optimal strategy of all firms. Thus, the peer influence could contribute to the clustering of repurchase announcements.

Under the influence of peers' repurchase announcements, a focal firm might strategically react to the peers by making following announcements. Because peers' announcements generate a negative signal of the focal firm's performance and financial health (Massa et al. 2007), the focal firm may strategically follow peers' action to reduce this negative impact. The mimicking behavior based on strategic reaction will generate value for the firm as it is made on the purpose to improve firm performance.

Alternatively, when peers announce repurchases, a focal firm may herd with peers by ignoring private information. Repurchase announcement is not an easy decision for managers, as managers need to balance the benefits and costs of share repurchases. When managers can't decide whether to announce repurchases or not, they may just conform to the majority by mimicking their peers' action. This herding behavior is made without rational judgment and clear purpose, which should not create value for the firm or even reduce firm value.

Therefore, to explore whether managers herd in announcing repurchases under peer influence, I raise two research questions as follows,

RQ1: In the absence of common factor, is there peer influence in share repurchase announcements?

RQ2: Does the repurchase under peer influence generate value or not, supporting strategic reaction or herding respectively?

As higher managerial ability and more external monitoring could reduce managers' irrational behavior, such as herding, I further predict that if there is managerial herding in repurchase announcements, the peer influence will be stronger when the managerial ability is lower and the external monitoring is weaker.

3. Literature Review

3.1 Herding in Financial Markets

Herding is a prevailing human behavior and it is also popular in the financial decisions of the participants in financial markets (Scharfstein and Stein 1990; Spyrou 2013). One of the most well-studied participants who herd in financial markets is the investor. Institutional investors are found to herd in making investment decisions (Sias 2004). And Jiang and Verardo (2018) find that mutual funds that herd with peers have worse performance. The second well-studied participant is the analysts who are found to herd in making analyst forecasts, which leads to the convergence of consensus analyst forecasts (Olsen 1996). Herding forecasts are found to incorporate less analysts' private information than bold forecasts (Clement and Tse 2005) and early forecasts are of higher quality than later forecasts (Keskek et al. 2014). Cooper et al. (2001) show that herding analysts' forecasts have less impact on stock prices than lead analysts. And analysts are found to herd more when they face higher decision fatigue (Hirshleifer et al. 2019; Jiao 2023). Analysts are also found to herd in issuing stock recommendations (Welch 2000; Jegadeesh and Kim 2009). Xue (2016) and Lee and Lee (2015) find that independent

analysts may herd with affiliated analysts in making stock recommendations and forecasts to increase recommendation and forecast accuracy, respectively.

Corporate managers, as another important participant in the financial market, are also exposed to herding behavior. In making certain corporate decisions or policies, firm managers tend to mimic their peers, leading to managers' herding behavior. For instance, corporate managers are found to follow their peers in making voluntary disclosures, such as disclosure of earnings warnings (Tse and Tucker 2009), advertising spending (Shi et al. 2021), and capital expenditure forecasts (Brown et al. 2006). In addition to disclosure decisions, managers also herd in making CSR (corporate social responsibility) policies (Nofsinger et al. 2022). Among these herding decisions of managers, some of them are mimicking behavior under rational mechanisms. Some managers may strategically herd with peers. For instance, the cluster of earnings warnings will let the firms share the blame for unexpected earnings and reduce the negative impact on the stock price of the herding firm (Tse and Tucker 2009). Also, some managers herd with peers by incorporating private information. For instance, prior peers' disclosure of advertising spending reduces the focal firm's uncertainty about its advertising disclosure, which leads to the focal firms' herding disclosure (Shi et al. 2021). While the managers' mimicking behavior without underlying economic mechanisms is less documented in the literature.

Based on the explanation of herding behavior which is defined as mimicking behavior with rational mechanisms in previous literature, there are three potential underlying economic theories: information cascade, reputation competition, and other strategic clustering (Tse and Tucker 2009). According to information cascade theory, peer firms' decision discloses their private information. The focal firm will incorporate this information and ignore its private information, leading to herding behavior. The prior evidence of managers' mimicking in advertising disclosure (Shi et al. 2021) is based on this theory. As for reputation competition

theory, managers have incentives to follow their peers' consensus behavior, otherwise, the investor might question the manager's ability, which leads to managerial reputation concerns in the labor market. As noted by Keynes (1939), "it is better for reputation to fail conventionally than to succeed unconventionally". Thus following peers in making decisions is better for the manager's reputation, and managers with more reputation concerns in the labor market are more likely to herd (Scharfstein and Stein 1990). Other strategic clustering theory shows that for some purposes, managers might strategically follow peers in making decisions. Tse and Tucker (2009) show that the cluster of earnings warnings disclosure is a strategic herding behavior of managers to share the blame. Those mimicking behaviors with underlying mechanisms are made by managers' judgment and comparison between private information and public information. And those managerial mimicking behaviors arising from informational learning or reputational competition of capable decision-making are usually considered as rational behaviors (Devenow and Welch 1996).

In prior herding literature, most studies examine the above mimicking behaviors with rational reasons and try to figure out what is the underlying mechanism of the mimicking behavior, but less study investigates the mimicking behavior without rational reasons and underlying mechanisms. Prior literature shows certain evidence of the existence of mimicking behavior without the rational judgment of investors. Lin et al. (2013) show that institutional investors are likely to mimick rationally based on their superior information, as the trades of institutional investors could reduce noise in the trading market, while individual investors are likely to mimick without rational judgment due to their limited information.

In this study, I try to add to this literature by examining the existence of managers' irrational mimicking behavior in announcing share repurchases and we define the managers' mimicking behavior of ignoring private information and without rational judgment as managerial herding.

Managers' mimicking behavior with rational reasons could benefit the firm and create value for the firm, while managerial herding without underlying mechanisms and judgment can hurt the firm's benefits and reduce firm value.

3.2 Share Repurchases

Share repurchase is an important corporate payout policy and has become increasingly popular (Skinner 2008). One purpose of firms announcing share repurchases, as a payout policy, is to distribute cash. This cash distribution mechanism makes the share repurchase a positive information signal of healthy financial condition and reflects less agency cost of free cash flow, which will attract more investors and lead to short-term stock price increases (Dann 1981). Besides, share repurchases could also be used to consolidate ownership or to make stock ownership incentives. However, managers who ever made share repurchases rank stock undervaluation as the first reason for making share repurchase decisions (Brav et al. 2005). Managers could take advantage of the stock undervaluation by repurchasing shares to reduce the cost of capital, which will benefit the shareholders and lead to long-term abnormal returns (Ikenberry et al. 1995).

The announcement of a repurchase can have both benefits and costs, which have been extensively discussed in the literature of accounting and finance. Based on above mentioned three general purposes of announcing share repurchase, below shows the corresponding benefits and costs of announcing share repurchases:

Benefits of a Firm's Decision to Announce Repurchase:

1. Enhanced Shareholder Value: One of the primary reasons for a firm to announce a repurchase is to enhance shareholder value. By reducing the number of outstanding shares, the repurchase increases the ownership stake of existing shareholders. This, in

turn, increases earnings per share (EPS), dividend per share, and other key financial ratios, which can lead to an increase in the company's stock price. Numerous studies have shown a positive relationship between repurchase announcements and subsequent stock price increases (Comment and Jarrell 1995; Ikenberry et al. 1995).

2. **Tax-Efficient Distribution of Surplus Cash:** Repurchases are often seen as a tax-efficient way of distributing surplus cash to shareholders. Compared to dividends, which are typically subject to higher tax rates, capital gains tax on the sale of repurchased shares may be lower. This tax advantage can be particularly beneficial to shareholders, especially those in higher tax brackets, resulting in higher after-tax returns (Asquith and Mullins Jr 1986).
3. **Signaling Effect:** Repurchase announcements can serve as a signal to the market that the management believes the company's stock is undervalued. By committing to repurchasing shares, the management demonstrates confidence in the company's future prospects and its ability to generate cash flows. This positive signal can enhance investor confidence, attracting new investors and potentially increasing the stock price (Grullon and Michaely 2004; Vermaelen 1981).
4. **Flexibility in Capital Structure:** Repurchases provide firms with the flexibility to adjust their capital structure by reducing equity capital. This can be advantageous when a company has excess cash and does not have sufficient investment opportunities or wants to optimize its capital structure. Repurchases can also be used to counteract dilution caused by stock-based compensation plans or employee stock options (DeAngelo et al. 2006; Harris and Raviv 2005).

Costs of a Firm's Decision to Announce Repurchase:

1. **Misallocation of Resources:** Critics argue that repurchases can sometimes lead to a misallocation of resources. When a firm announces a repurchase, it commits a significant amount of cash to buy back shares. This cash could have been used for alternative investments such as research and development, acquisitions, or capital expenditures that might have generated higher long-term returns. In this case, the repurchase may result in missed growth opportunities (Brav et al. 2005; Opler and Titman 1993).
2. **Market Timing Risks:** Repurchases involve market timing risks. If a company announces a repurchase when the stock price is high, it may end up overpaying for its shares, reducing the benefits to shareholders. Conversely, if the company announces a repurchase when the stock price is low, it may fail to realize the potential benefits of the repurchase. Timing the market correctly is challenging, and poor timing can result in value destruction for shareholders (Baker and Wurgler 2002; Dittmar 2000).
3. **Agency Costs and Insider Trading:** Repurchases can create agency costs and potential conflicts of interest between managers and shareholders. Managers might use repurchases to manipulate stock prices or enhance their stock options' value. Furthermore, insiders with material non-public information may engage in illegal insider trading based on the knowledge of the repurchase announcement, leading to reputational damage and legal consequences for the firm (Jagannathan et al. 2000).
4. **Reduced Financial Flexibility:** Repurchases involve the use of cash, which can reduce a firm's financial flexibility. If a firm depletes its cash reserves to repurchase shares, it may face difficulties in funding future investments, acquisitions, or working capital needs. This reduced flexibility can be a concern, particularly during economic downturns or when unexpected financial needs arise (Grullon and Michaely 2002).

The above-discussed benefits and costs of announcing share repurchases are not exhaustive and may vary depending on the specific circumstances and context of each repurchase decision. Moreover, the empirical evidence on the effects of repurchases is mixed, with some studies showing positive outcomes and others highlighting potential drawbacks. Therefore, it is crucial for firms to carefully evaluate their financial position, growth prospects, and shareholder expectations before deciding to announce a repurchase, which indicates that share repurchase is not an easy decision for managers and gives the potential to peer influence in share repurchase decisions.

The peer influence of share repurchase is slightly examined by previous literature. Massa et al. (2007) find that firms in concentrated industries will mimick their peers to make share repurchases to mitigate the negative impact of their peers' share repurchases on their stock market performance. Adhikari and Agrawal (2018) show that there is a peer effect in firms' share repurchase policies that firms follow their peers to do share repurchase, and they find that this imitation behavior seems to come from competing with industry peers. But Grennan (2019) finds no peer influence on share repurchase, although there's peer influence in dividend policies. Thus, the evidence of the peer effect or managers' herding behavior in share repurchases from previous literature is inconclusive. This study tries to add to this literature by providing more evidence of managers' mimicking behavior in share repurchase and further examines the existence of managers' mimicking behavior without rational judgment which is defined as managerial herding in share repurchase in this study.

4. Empirical Methodology

In the empirical analysis, to examine the peer influence in share repurchases, I specifically examine the relationship between a focal firm's share repurchase announcement and its peer firms' share repurchase announcements. Thus, I use the following OLS regression model:

$$SR_ANN_{i,t} = \beta_0 + \beta_1 Peer_SR_ANN_PERC_{-i,j,t} + \sum \beta Controls + \varepsilon_{i,t} \quad (1)$$

The dependent variable $SR_ANN_{i,t}$ is a dummy variable that is equal to one if firm i announces a share repurchase in quarter t . The independent variable of interest $Peer_SR_ANN_PERC_{-i,j,t}$ is the percentage of peers announcing share repurchases in the same industry and quarter as the announcement of firm i . I expect β_1 to be significantly positive if there is peer influence in share repurchases. Because if managers mimic peers in announcing share repurchases, a higher proportion of peers announcing share repurchases will reduce the uncertainty and increase the probability of the focal firm's announcement of share repurchases.

I also include several control variables that affect a firm's share repurchase decision, following prior literature (Lee and Suh 2011; Massa et al. 2007). First, I control for firm characteristics that may affect a firm's share repurchase decision, such as a firm's prior quarter's cash holdings (*Cash*), Operating profitability (*ROA*), Firm Size (*Size*), Leverage (*Lev*), and Retained-earnings-to-total-equity ratio (*RE/TE*). Second, to control for a firm's own incentive to protect stock price by announcing share repurchase when its stock is undervalued, I also include a firm's prior quarter's stock return (*Lag_Ret*) as a control variable.

To identify industry peers, I employ the three-digit SIC industry classifications. And I include firm-fixed effects to control for time-invariant firm-specific factors. I also include calendar year fixed effects to control for time-variant trends in share repurchase. The standard errors are adjusted to account for heteroskedasticity and clustered at the firm level.

However, Equation (1) may only detect the clustering of share repurchases but not the peer influence of share repurchases. Because the positive correlation between the focal firm's share repurchase and its peers' share repurchases might come from the impact of common economic

or industrial factors on both the focal and peer firms' repurchase decisions. Thus, there is an endogeneity concern about omitted variables in Equation (1).

Following Seo (2021), I use an identification strategy of an instrument variable to address the endogeneity problem. The instrumental variable utilized is the lagged idiosyncratic equity return shocks of peer firms, serving as exogenous variation specific to the characteristics of those firms (Manski 1993). This instrument variable is obtained by excluding the effect of common market and industry factors in the stock shock. When there is a negative shock of peers' stock returns, the peers tend to announce share repurchases to protect stock prices. This negative relation satisfies the relevance criterion of the 2SLS regression method. However, the exogenous stock return shock specific to peers should not influence the share repurchase decision of the focal firm, which satisfies the exclusion criterion of 2SLS. Thus, the peer firms' lagged idiosyncratic equity return could serve as a good instrument for $Peer_SR_ANN_PERC_{i,j,t}$ in Equation (1).

Drawing from Leary and Roberts (2014), I extract the idiosyncratic component of a firm's stock return by employing the following asset pricing model:

$$r_{i,t} = \alpha_{i,t} + \beta_{i,t}^{MKT} (rm_t - rf_t) + \beta_{i,t}^{IND} (r_{-i,t} - rf_t) + \eta_{i,t} \quad (2)$$

In Equation (2), the dependent variable $r_{i,t}$ is the stock return of firm i in quarter t . The independent variable $(rm_t - rf_t)$ is the market excess return in quarter t and the independent variable $(r_{-i,t} - rf_t)$ is the excess return of industry peers in quarter t , where $r_{-i,t}$ is the return of an equal-weighted industry portfolio excluding firm i in quarter t . These two independent variables measure the common risk factor from the market and the industry. Thus, by using this model, I can isolate the common economic and industrial risk factors faced by both the focal firm and its peers and address the endogeneity concern.

Following Seo (2021), I build the instrument variable by conducting the following steps. First, to estimate the coefficients of Equation (2) for firm i , I perform the regression on a rolling quarterly basis, utilizing the previous 60 monthly returns leading up to the observed quarter. I require at least 24 observations in each rolling regression period. Second, after getting the factor loadings in Equation (2), I multiply them with the monthly factor returns to calculate the monthly expected returns over the observation quarter. Next, I determine the idiosyncratic monthly return by calculating the disparity between the monthly raw return and the monthly expected return during the observation quarter. Then, I aggregate the monthly idiosyncratic returns over the fiscal quarter to derive the quarterly idiosyncratic return. Finally, I calculate the conditional mean of the quarterly idiosyncratic returns of peers in the same industry as firm i (excluding firm i), and I lag this variable by 1 period to obtain the instrument variable.

The instrument variable measures the peers' idiosyncratic stock return shocks which should be exogenous to a focal firm's decision-making. Using the instrument variable could exclude the clustering of share repurchases due to common economic or industry factors. Therefore, if there is peer influence in share repurchase, I expect that the positive relationship between a focal firm's share repurchase announcement and its peers' share repurchase announcements still exists by using this instrument variable.

If the peer influence in share repurchase is found in the 2SLS regression by using the instrument variable, this peer influence may not come from managers' learning of information of peers. The instrumented peers' share repurchase decisions are based on peers' idiosyncratic characteristics which are not relevant to the focal firm's decision-making. Consequently, the focal firm cannot learn useful information from peers' idiosyncratic decisions and make consequent repurchase announcements.

If the information learning mechanism is excluded, the rest two competing mechanisms underlying the peer influence in share repurchases would be managerial herding or managers' strategic reaction. As managers' strategic reactions are based on managers' rational judgment and private information, repurchase announcements made out of this reason should generate value for the company. However, managerial herding is without managers' rational judgment and underlying economic mechanisms. Therefore, the repurchase announcements due to managerial herding should not create value or even reduce the value of the firm.

Thus, to examine whether managerial herding exists in share repurchase announcements, I conduct a valuation analysis of managers' repurchase decisions by testing the change of firms' Tobin's Q after share repurchase announcements. In this test, I only include firm-quarter observations in which the firm announced share repurchases in that quarter. I regress the firm's quarter change of Tobin's Q on the firm's peers' percentage of repurchase announcements or the indicator of no repurchase announcement of peers. If the managerial herding exists which means the repurchase announcement made by mimicking peers doesn't generate value, I expect the peers' percentage of repurchase announcements to have no effect or a negative effect on the focal firm's Tobin's Q.

To further prove the existence of managerial herding, I conduct a subsample test based on the cross-sectional differences in managerial ability. Jiang and Verardo (2018) find that less skilled managers are more likely to herd. As less skilled managers have less ability to make a rational judgment, I expect the managerial herding in share repurchase is more pronounced for managers with less managerial ability. I partition the total sample into subsamples based on the median of MA-Score, which is borrowed from Demerjian et al. (2012) to measure managers' managerial ability. If the managerial herding of share repurchase exists, I expect that the results of the 2SLS regression will be more pronounced in the subsample of low managerial ability.

To provide more evidence of managerial herding, I conduct another subsample test based on the cross-sectional differences in institutional ownership concentration. Higher institutional ownership can increase institutional investors' monitoring of managers' performance which will reduce managerial herding behavior (Black and Kim 2012; Dharwadkar et al. 2008). I partition the total sample into subsamples based on the sample median of institutional ownership concentration, which is calculated by using the method of the HHI index. If the managerial herding of share repurchase exists, I expect that the results of the 2SLS regression will be less pronounced in the subsample of higher institutional ownership concentration.

5. Data, Sample and Statistics

In this study, I build the testing sample by using publicly listed US firms. I obtain firms' fundamental statistics data from the Compustat database and stock price data from the CRSP database. The share repurchase data is obtained from the SDC database. For the subsample tests, I obtain managers' managerial ability data from the dataset developed by Demerjian et al. (2012). The institutional ownership data is from 13F filing data from the Thomson Reuters database and the S&P credit rating data is from the Compustat database. The full sample period is from 1990 to 2020. I exclude observations that miss the data for calculating the variables used in the baseline test and instrument variable test, which include financial statistics, stock return, and the instrument variable. The final sample has a total of 470,963 firm-quarter observations. The definition of the main variables is listed in the appendix of this paper.

Table 1 describes the summary statistics of the main variables. All variables are winsorized at the 1% and 99% levels. The mean of *SR_ANN* is 0.028 which demonstrates that on average around 3% of firms announced share repurchases in each quarter. The mean of *Peer_SR_ANN_PERC* is 0.019 which indicates that on average around 2% of a firm's peers

announced share repurchases in the same quarter. Table 2 shows the pairwise correlations of the main variables. There is no very high correlation among the main variables.

In addition, the time-series trend of share repurchase announcements is shown in Figures 1 and 2. Figure 1 shows the trend of the number of total firms announcing share repurchases during the sample period between 1990 and 2020. As shown in this figure, the share repurchases happened in waves and support the clustering phenomenon of share repurchases, especially during the 1998 and 2008 financial crises. Figure 2 shows the trend of the number of share repurchase announcements. The number of share repurchase announcements has the same trend as the number of firms announcing share repurchases. And the level of share repurchase announcements is slightly lower than the level of firms announcing share repurchases, which indicates that firms are less likely to announce several share repurchases in one year.

In Figure 3, I compare the trends of alone share repurchases with clustered share repurchases. Alone share repurchases are classified as share repurchases without any peer announcing share repurchases in the same quarter. And clustered share repurchases represent the share repurchase with the top quartile of the percentage of peers announcing share repurchases among the total sample of share repurchase announcements. As shown in Figure 3, the trend of alone share repurchases is flat over time, but the clustered share repurchases occurred in waves and are influenced significantly by the big financial crises, which further demonstrates the clustering phenomenon of share repurchases after a big downturn of stock prices.

6. Empirical Results

6.1 Main Results

6.1.1 Peer Influence in Share Repurchases

To examine the relationship between a focal firm's share repurchase announcement and its peer firms' share repurchase announcements, I run a regression of equation (1) which is described in section 4. The results are shown in Table 3 Column (1). The coefficient of *Peer_SR_ANN_PERC* is positive and significant, which indicates that when more peers from the same industry of a focal firm announced share repurchases, the focal firm is more likely to announce share repurchases. This result proves the clustering phenomenon of share repurchases. But it cannot show the peer influence in share repurchase, as the clustering of share repurchases could come from firms in the same industry facing the same economic condition and making the same share repurchase decisions.

To resolve this endogeneity concern in equation (1), I use an identification strategy of instrument variable *Peer_Lag_Abnormal_Ret* which is the peer firms' stock return shock in the previous quarter. The 2SLS regression results are shown in Table 3 columns (2) and (3). To test the relevance criterion of the instrument variable, the first stage regression result of 2SLS is shown in Table 3 column (2). The coefficient of *Peer_Lag_Abnormal_Ret* is negative and significant, which indicates that when there is a negative stock return shock in the previous quarter, firms are more likely to announce share repurchases to protect stock price. This result suggests that the instrument variable satisfies the relevance criterion. Additionally, it is worth mentioning that the first-stage Cragg-Donald Wald F-statistic attains a value of 224.285, signifying a strong indication that the instrumental variable successfully satisfies the requirements of the weak instrument test (Stock and Yogo 2002). The second stage regression result of 2SLS is shown in Table 3 column (3). The instrumented variable *Peer_SR_ANN_PERC* is positive and significant at the 10% level. This result gives evidence of the existence of peer influence in share repurchase, which means that a firm will mimick its peers to announce share repurchase, even though the focal firm face no common economic factors with its peers. The estimated coefficient indicates that a one standard deviation increase

in the percentage of peers announcing repurchases is associated with a 0.023 ($=0.863 \times 0.027$) increase in the probability of the focal firm's announcement, which stands for an 82% ($=0.023/0.028$) increase of the mean of a firm's probability to announce repurchase. This suggests that peers' announcements can significantly increase the focal firm's tendency to announce repurchases.

The finding in the 2SLS regression also excludes the information learning mechanism underlying the peer influence in share repurchases. Because the instrumented variable measures the probability of peers announcing share repurchase out of the peer firms' specific characteristics. The peers' idiosyncratic characteristics should not contain useful information to the focal firm. Consequently, managers' mimicking behavior in share repurchase should not come from learning useful information from peers.

6.1.2 Valuation Analysis: Managerial Herding VS Strategic Reaction

In the previous section, the results of the 2SLS regression indicate that the peer influence in share repurchase announcements is not likely caused by the common factor effect or managers' information learning from peers. Hence, managerial herding or managers' strategic reaction might be the factor that leads to managers' mimicking behavior in announcing repurchases. When peers announce share repurchases, the manager of the focal firm may strategically follow peers to announce share repurchases to reduce the negative impact of peers' announcements on the focal firm's stock performance. Or, the manager of the focal firm might blindly herd with the peers to announce share repurchase to conform with the majority due to the lack of independent judgment or decision-making. As managers' strategic reactions are based on managers' rational judgment and private information, repurchase announcements made out of this reason should generate value for the company. However, managerial herding is without managers' rational judgment and underlying economic mechanisms. Consequently, the

repurchase announcements due to managerial herding should not create value or even reduce the value of the firm.

Thus, to examine whether managerial herding exists in share repurchase announcements, I conduct a valuation analysis of managers' decisions to mimick peers' repurchase announcements by testing the change of firms' Tobin's Q after the mimicking share repurchase announcements. Because Tobin's Q is a financial ratio that can be used as a measure of a firm's value (Tobin 1969) and it is often used in prior empirical research to examine the valuation of the firm (Bartov and Bodnar 1994; Rajan and Zingales 1998), in this study I use the change of firm's Tobin's Q as the measure of the firm's value change after repurchase announcement. In this test, I only include firm-quarter observations in which the firm announced share repurchases in that quarter. The regressions of the valuation analysis are shown below,

$$Tobin_Q_Change_{i,t} = \beta_0 + \beta_1 Peer_SR_ANN_PERC_{-i,j,t} + \sum \beta Controls + \varepsilon_{i,t} \quad (3)$$

$$Tobin_Q_Change_{i,t} = \beta_0 + \beta_1 SR_Alone_{-i,j,t} + \sum \beta Controls + \varepsilon_{i,t} \quad (4)$$

The dependent variable $Tobin_Q_Change_{i,t}$ in the two regressions is the percentage change of firm i 's Tobin's Q during quarter t that the firm announced share repurchase. In addition, I also use an alternative measure of the change of Tobin's Q, $Tobin_Q_Increase$, which is a dummy variable that is equal to 1 if the firm's Tobin's Q increased after the firm's repurchase announcement, and 0 otherwise.

The independent variable of interest $Peer_SR_ANN_PERC_{-i,j,t}$ in regression (3) is the percentage of peers announcing share repurchases in the same industry j as firm i in quarter t . A higher value of $Peer_SR_ANN_PERC_{-i,j,t}$ indicates a higher probability that the firm i 's share repurchase announcement is influenced by peers in the same industry j . If managerial herding exists due to peer influence, I expect β_1 in regression (3) to be not significant or

significantly negative, because managerial herding will not generate value for the firm or even reduce firm value. The independent variable of interest $SR_Alone_{-i,j,t}$ in regression (4) is a dummy variable that is equal to one if the share repurchase is made without any peer announcing share repurchase in the same industry j as firm i in quarter t . When $SR_Alone_{-i,j,t}$ is equal to one, it means that this share repurchase announcement is very less likely to be influenced by peers. If peer influence leads to managerial herding, this repurchase announcement is less likely made due to managerial herding but by rational judgment which will increase firm value. Therefore, I expect β_1 in regression (4) to be significantly positive if managerial herding exists in repurchase announcements due to peer influence.

I include similar control variables that are also used in equation (1), which could affect market valuation. I also include one control variable that is related to the deal characteristics of the share repurchase. This control variable is $Psought$ which is the percentage of outstanding shares sought to be repurchased by the firm at the repurchase announcement. In the regressions of (3) and (4), I still include firm-fixed effects to control for time-invariant firm-specific factors and calendar year fixed effects to control for time-variant trends of firm valuation. Standard errors are robust to heteroskedasticity and clustered by firm.

The regression results of equations (3) and (4) are shown in Table 4. Columns (1) and (3) show the result of regression (3). The coefficient of $Peer_SR_ANN_PERC_{-i,j,t}$ is negative and significant which means that the mimicking repurchase announcements reduced firm value. This result demonstrates the existence of managerial herding in repurchase announcements, that is when peers announced share repurchases, the focal firm is likely to herd with peers and also announce share repurchases. Also, in Columns (2) and (4) which show the result of regression (4), the coefficient of $SR_Alone_{-i,j,t}$ is positive and significant as expected, which means that when no peers announced a share repurchase, the focal firm's repurchase

announcement can increase firm value. This result indicates that the repurchase announcement will create value for the firm when the announcement is less likely influenced by peers, which gives further evidence that the peer influence in repurchase announcements can lead to managerial herding.

6.2 Cross-Sectional Tests

The empirical results in section 6.1 indicate that peer influence happens in share repurchase announcements and managers actually herd with peers in announcing repurchases. In this section, I conduct cross-sectional tests based on managerial herding and institutional monitoring to provide more evidence of the existence of managerial herding, and I find the expected results that the peer influence in repurchase announcements is more pronounced when managers have less ability and when institutional monitoring is lower.

6.2.1 Managerial Ability and Managerial Herding in Share Repurchases

Managers with less ability have a higher probability to herd with peers (Jiang and Verardo 2018). Because managers with less ability have difficulties in utilizing resources and processing information and could not make self-judgment about whether to repurchase shares or not. They have less knowledge to determine when the share repurchase should be performed. Thus, when peers announced share repurchases, these managers are more likely to mimick their peers to announce repurchases without rational decision-making in order to conform with the majority. On the contrast, managers with more ability are less likely to conduct these irrational behaviors. These managers have more ability to analyze the impact of peers' repurchase announcements on their firms' performance. And they have more ability to strategically react to peers' actions to reduce the potential negative impact of the peers' actions. As peers' repurchase announcements may generate a negative signal of the focal firm (Massa et al. 2007), if the focal firm has a manager with high ability, this manager would strategically follow peers

to announce share repurchase to reduce the negative impact. Therefore, under the influence of peers' repurchase announcements, managers with less ability are more likely to herd with peers and managers with more ability are more likely to strategically mimick peers to also make announcements. Thus, if the managerial herding exists, I expect that the peer influence is more pronounced when managers have less ability.

To test whether managers herd in announcing share repurchases, I conduct a subsample test based on managerial ability which is measured by using the MA-Score calculated by Demerjian et al. (2012), who quantify how efficiently managers utilize their resources. The dataset for the MA-Score is updated by the authors, which includes observations for fiscal years from 1980 through 2020. I merge the MA-Score data with my total sample, and after the data merge, the testing sample becomes smaller because of the missing data from the MA-Score. I partition my testing sample based on the median of MA-Score in each industry in each year. Observations that have higher MA-Scores than the median are assigned to the subsample of *MA-Score_High*, and the rest of the observations are assigned to the subsample of *MA-Score_Low*. I conduct the 2SLS regressions in each of the subsamples. As I conjecture that managers with lower managerial ability would more likely herd irrationally with their peers, I expect that the coefficient of instrumented *Peer_SR_ANN_PERC* in the second stage result of the 2SLS regression would be more pronounced in the subsample of *MA-Score_Low* if managerial herding exists in repurchase announcements.

The regression results are shown in Table 5. Columns (1) and (2) show the results of the second stage of 2SLS regression in the subsamples of *MA-Score_Low* and *MA-Score_High*, respectively. The coefficient of instrumented *Peer_SR_ANN_PERC* is positive and significant in the subsample of low managerial ability, but it is not significant in the subsample of high managerial ability. The difference in the coefficient of the instrumented variable between the

two subsamples is significant at the 1% level. The results from the subsample tests demonstrate that compared to managers with higher ability, managers with lower managerial ability are more influenced by peers which indicates that managerial herding exists and managers are likely to herd with peers to announce share repurchases.

6.2.2 External Monitoring and Managerial Herding in Share Repurchases

Institutional investors with more monitoring effect and corporate influence on the firm can reduce managers' irrational behavior including managerial herding. The monitoring role of institutional investors can reduce agency problems and managerial behavior that may be detrimental to firm performance (Black and Kim 2012). Consequently, Managerial herding in share repurchases as a manager's decision without rational thinking could be mitigated by institutional investors that have more monitoring impact on the firm. In addition, institutional investors have professional expertise and market knowledge. They could give constructive advice to managers to improve decision-making, form strategies to react to peers' actions, and mitigate irrational behaviors. Thus, when institutional investors have more influence on corporate strategies, the managers may conduct more strategic reactions and less herding behavior under peer influence. When the institutional ownership concentration is higher, institutional investors will have a higher monitoring effect and corporate influence on the firm (Dharwadkar et al. 2008). Therefore, if managers herd with peers in repurchase announcements, I expect managers' mimicking behavior to be less pronounced when the firm's institutional ownership concentration is high.

To provide more evidence of the existence of managerial herding and test the impact of institutional ownership concentration on managerial herding in share repurchase, I conduct a cross-sectional test in which subsamples of different levels of institutional ownership concentration are used. I measure institutional ownership concentration by using the

Herfindahl-Hirschman Index (HHI) method, which is based on a firm's all institutional holdings. The calculated variable of institutional ownership concentration is denoted as *InstOwn_HHI*. The lower value of the *InstOwn_HHI* index indicates low institutional ownership concentration and thus a lower monitoring effect of institutional investors. The total sample is partitioned into subsamples of low institutional ownership concentration (*InstOwn_HHI_Low*) and high institutional ownership concentration (*InstOwn_HHI_High*) based on the sample median of the *InstOwn_HHI* index in each quarter. I conduct the 2SLS regressions of equation (1) in each subsample and compare the coefficients of the instrumented *Peer_SR_ANN_PERC* between the two subsamples. If managers herd with peers to announce share repurchases, I expect that the coefficient of *Peer_SR_ANN_PERC* would be less pronounced in the subsample of *InstOwn_HHI_High*.

The regression results of the subsample tests are shown in Table 6. Columns (1) and (2) show the 2SLS regression results in the two subsamples. The coefficient of instrumented *Peer_SR_ANN_PERC* is positive and significant in the subsample of *InstOwn_HHI_Low*, but it is negative and not significant in the subsample of *InstOwn_HHI_High*. Also, the difference between the two coefficients in the subsample of *InstOwn_HHI_Low* and the subsample *InstOwn_HHI_High* is positive and significant at the 1% level. The 2SLS regression results indicate that managers are more likely to mimic peers in announcing share repurchases when the institutional ownership concentration is higher and supports the argument that managers do herd with peers. The findings of this cross-sectional test provide further evidence that managerial herding exists in repurchase announcements and shows that institutional investors' monitoring might mitigate this managerial herding behavior.

6.3 Additional Analysis

6.3.1 Financial Constraints and Managerial Herding in Share Repurchases

If managers herd with peers to conduct share repurchases, they need sufficient cash or financing resources to support the share repurchase policy. Otherwise, the share repurchase policy cannot be achieved even though the managers have the intention to herd with peers. The financially constrained firms will especially suffer from the lack of financing resources to perform share repurchases. Therefore, I expect that managers in financially constrained firms are less likely to herd with peers to announce share repurchases. In accordance with the research of Farre-Mensa and Ljungqvist (2016), which indicates that the absence of a credit rating is a more effective indicator of a firm's financial constraints compared to other conventional measures, I utilize the credit rating assigned by S&P as a metric to assess a firm's financial constraints¹.

To test the impact of financial constraints on managerial herding in share repurchase, I conduct a cross-sectional test in which two subsamples of financially constrained firms and non-financially constrained firms are used. I measure firms' financial constraints by using the existence of credit rating assigned by S&P, following Farre-Mensa and Ljungqvist (2016). I regard firms without S&P credit ratings as financially constrained firms and regard the firms with S&P credit ratings as non-financially constrained firms. Thus, I partition the total sample into subsamples of financially constrained firms (*Credit_Rating_NO*) and non-financially constrained firms (*Credit_Rating_YES*) based on the existence of the S&P credit rating. I conduct the 2SLS regressions of equation (1) in each subsample and compare the coefficients of the instrumented *Peer_SR_ANN_PERC* between the two subsamples. If firms' financial constraints mitigate managers' herding in announcing share repurchases, I expect that the coefficient of *Peer_SR_ANN_PERC* would be less pronounced in the subsample of *Credit_Rating_NO*.

¹ I also use other alternative measures of financial constraints that are used in prior literature, including KZ and WW indexes, and I also find similar results.

Table 7 shows the regression results of this cross-sectional test. Columns (1) and (2) show the 2SLS regression results in the two subsamples. The coefficient of *Peer_SR_ANN_PERC* is larger and significant in the subsample of *Credit_Rating_YES*, but it is smaller and not significant in the subsample of *Credit_Rating_NO*. Also, the difference between the two coefficients in the subsample of *Credit_Rating_NO* and the subsample of *Credit_Rating_YES* is negative and significant at the 1% level. The 2SLS regression results indicate that managers are less likely to herd in announcing share repurchases when they are financially constrained. The findings of this cross-sectional test show that financial constraints work well in mitigating managers' irrational behaviors such as herding in announcing share repurchases.

6.4 Robustness Test

6.4.1 Lead-Lag Analysis of Peer Influence in Share Repurchases

In previous empirical tests, I examine the peer influence in repurchase announcements by testing the relation between a focal firm's repurchase announcement and its peers' percentage of announcing repurchases in the same quarter. One concern in this test is that the peers' repurchase announcements may happen after the focal firm's announcement, which should not be regarded as the focal firm mimicking its peers.

To reduce this timing concern, I conduct the lead-lag analysis of managerial herding by running the following regression,

$$SR_ANN_{i,t} = \beta_0 + \beta_1 Lag_Peer_SR_ANN_PERC_{-i,j,t-1} + \sum \beta Controls + \varepsilon_{i,t} \quad (5)$$

This equation (5) is similar to equation (1), except that the independent variable is changed to $Lag_Peer_SR_ANN_PERC_{-i,j,t-1}$ which is the percentage of peers announcing share repurchases in the same industry j as firm i in quarter $t-1$, i.e. the prior quarter. Hence, this regression tests the relationship between the peers' repurchase announcements in the prior

quarter and the focal firm's announcement in the current quarter. If peer influence exists, there should be a positive relationship, and β_1 in equation (5) should be positive and significant. To address the endogeneity concern in this regression which is the potential impact of common economic or industrial factors, I also use the *Peer_Lag_Abnormal_Ret* as an instrument variable to conduct the 2SLS regression. If the clustering phenomenon of repurchase announcements is not caused by a common effect but the peer influence, I expect the coefficient of the instrumented *Lag_Peer_SR_ANN_PERC*_{-i,j,t-1} is positive and significant.

Table 8 shows the regression results. Column (1) shows the result of the OLS regression of equation (5). The coefficient of *Lag_Peer_SR_ANN_PERC* is positive and significant as expected, which shows that a firm is more likely to announce a share repurchase when a large proportion of its peers announced repurchases in the prior quarter. This finding further demonstrates the clustering phenomenon of repurchase announcements. Columns (2) and (3) show the results of the first and second stages of the 2SLS regression, respectively. In the first stage where *Lag_Peer_SR_ANN_PERC* is the dependent variable, the coefficient of *Peer_Lag_Abnormal_Ret* is negative and significant which shows that there is a significant negative relation between the instrument variable and the independent variable of interest in the equation (5). This result demonstrates that this instrument variable satisfies the relevance criterion. In the second stage result, the coefficient of the instrumented *Lag_Peer_SR_ANN_PERC* is positive and significant at the 10% level, which indicates that managers do mimick their peers' prior repurchase announcements to announce repurchases. This finding further proves the existence of peer influence in repurchase announcements.

7. Conclusion

The share repurchase policies announced by corporate managers show a clustering pattern. This clustering pattern could be attributed to the common economic or industry factors that

cause the managers to make the same corporate decisions. But, not all firms have the consciousness or ability to perform share repurchase, and share repurchase might not be the optimal strategy for every firm. Therefore, this clustering pattern could also be due to peer influence which is prevalent in various contexts. In this paper, I conduct empirical tests and show that peer influence does contribute to the clustering phenomenon. Furthermore, I also provide evidence of the existence of managerial herding in share repurchases.

In the empirical results, I find that the probability of a firm announcing a share repurchase has a positive association with the probability of share repurchase announcements of the firm's peers. This finding proves the clustering phenomenon of share repurchases. To further identify the peer influence, I use an identification strategy of instrument variable method based on peers' idiosyncratic stock return shocks which should be exogenous to a focal firm's decision-making. And in the results of the 2SLS regression, I still find the positive association between a focal firm and its peers' share repurchases by using the instrument variable. This finding indicates that managers do follow their peers in announcing share repurchases. Also, I find that the mimicking repurchases can reduce firm value which is measured by firms' Tobin's Q. This finding suggests that managers mimic peers in announcing repurchases without rational judgment, supporting the existence of managerial herding in repurchase announcements.

In addition, in cross-sectional tests, I find that the peer influence is less pronounced when managers have higher ability and when institutional investors' monitoring effect is stronger. These findings provide further evidence of the existence of managerial herding in repurchase announcements. In an additional test, I find that financial constraints can work well in mitigating the managerial herding behavior. And in the robustness test, I conduct lead-lag analysis and further prove that a firm's repurchase announcement is influenced by its peers' prior announcements.

Overall, this paper finds that there is peer influence in repurchase announcements and managers do herd with peers in announcing share repurchases. The findings of this paper imply that investors should be cautious when managers herd with peers in making corporate decisions, as some of these decisions could be irrational and hurt investors' benefits. The implication of this paper could help investors have better estimates of firms' share repurchase efficiency and firm valuation so that they could make better investment decisions. And it may also encourage corporate directors to improve corporate governance to reduce managers' herding behavior.

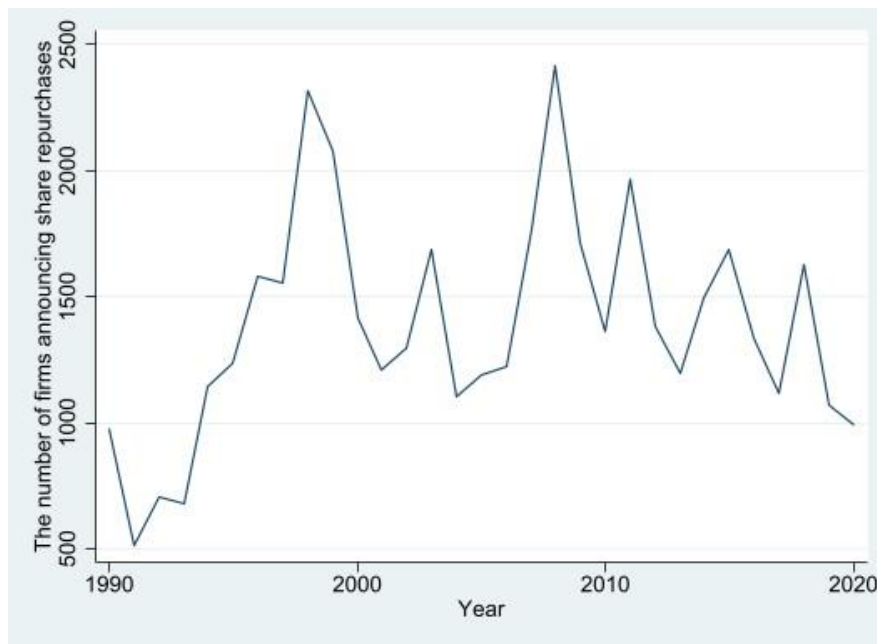
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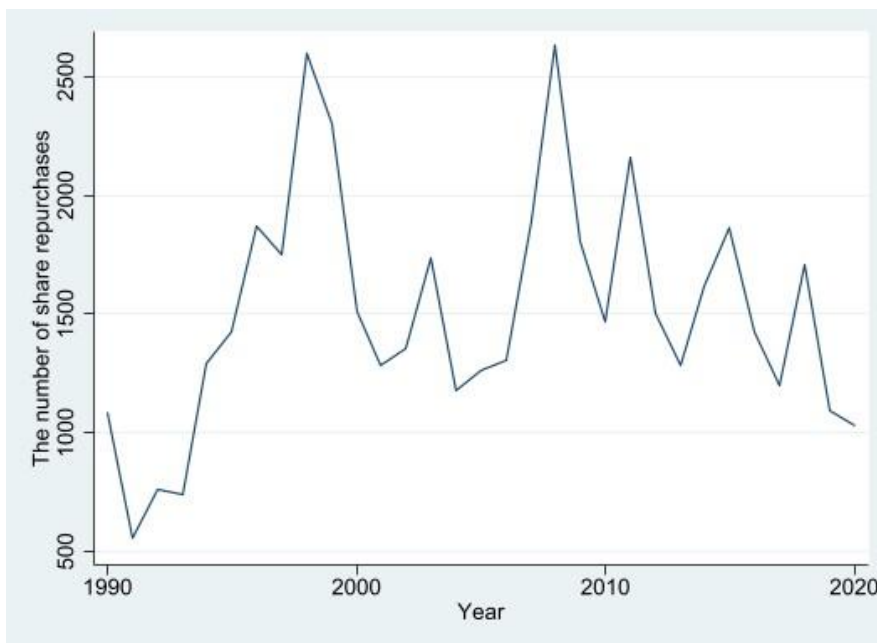
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Figure 1: The Trend of the Number of Firms Announcing Share Repurchases



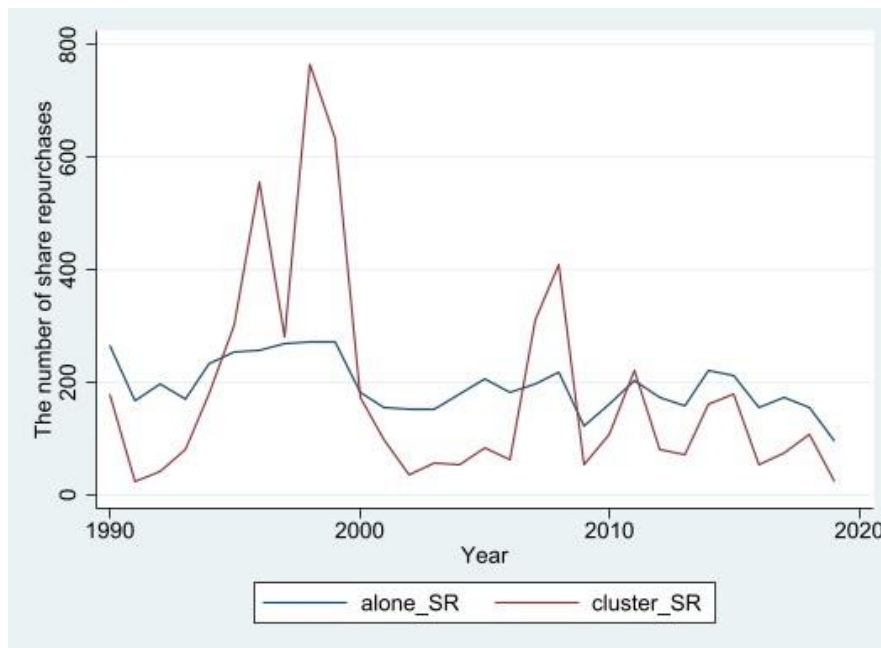
Notes: This figure shows the trend of total firms announcing share repurchases in the SDC database. The number of firms announcing share repurchase increased a lot in the 1990s, remained a high level in the 2000s, and had a small decrease in the 2010s. The figure also demonstrates that the number of firms announcing share repurchase was influenced a lot by the big financial crises.

Figure 2: The Trend of the Number of Share Repurchase Announcements



Notes: This figure shows the trend of total share repurchase announcements in the SDC database. It had the same trend as the number of firms announcing share repurchases. Compared to Figure 1, the number of share repurchases is slightly larger than the number of firms announcing share repurchases in each year, which indicates that firms are less likely to announce several share repurchases in one year.

Figure 3: Alone Share Repurchases VS Clustered Share Repurchases



Notes: this figure shows the comparison between alone share repurchases VS clustered share repurchases. Share repurchases of firms with no peer announcing share repurchase in the same quarter are regarded as stand-alone share repurchases. In contrast, Share repurchases of firms with the percentage of peers announcing share repurchase in the same quarter that is in the top quartile of total repurchase sample are regarded as clustered share repurchases. Stand-alone share repurchase is flat overtime. The clustered share repurchase is influenced a lot by the big financial crises.

Table 1: Summary Statistics

Variable	N	mean	sd	p5	p25	p50	p75	p95
<i>SR_ANN</i>	470,963	0.028	0.166	0.000	0.000	0.000	0.000	0.000
<i>Peer_SR_ANN_PERC</i>	470,963	0.019	0.027	0.000	0.000	0.011	0.028	0.071
<i>Peer_Lag_Abnormal_Ret</i>	470,963	-0.003	0.047	-0.074	-0.020	-0.003	0.011	0.071
<i>Cash</i>	470,963	0.165	0.211	0.003	0.024	0.073	0.223	0.666
<i>Lev</i>	470,963	0.636	1.528	0.000	0.004	0.261	0.800	2.822
<i>Size</i>	470,963	5.844	2.265	2.196	4.167	5.820	7.411	9.727
<i>ROA</i>	470,963	-0.010	0.065	-0.139	-0.007	0.004	0.017	0.046
<i>RE/TE</i>	470,963	-0.693	4.739	-7.066	-0.297	0.335	0.712	1.335
<i>Lag_Ret</i>	470,963	0.023	0.276	-0.394	-0.125	0.005	0.136	0.498

Notes: This table presents descriptive statistics for variables used in all regressions for the full sample. All variables are defined in the Appendix.

Table 2: Correlations

	<i>SR_ANN</i>	<i>Peer_SR_ANN_PERC</i>	<i>Peer_Lag_Abnormal_Ret</i>	<i>Cash</i>	<i>Lev</i>	<i>Size</i>	<i>ROA</i>	<i>RE/TE</i>	<i>Lag_Ret</i>
<i>SR_ANN</i>	1.000								
<i>Peer_SR_ANN_PERC</i>	0.067***	1.000							
<i>Peer_Lag_Abnormal_Ret</i>	-0.007***	-0.029***	1.000						
<i>Cash</i>	-0.013***	-0.098***	-0.004**	1.000					
<i>Lev</i>	-0.003**	0.027***	0.005***	-0.175***	1.000				
<i>Size</i>	0.076***	0.086***	-0.004**	-0.285***	0.181***	1.000			
<i>ROA</i>	0.056***	0.071***	-0.006***	-0.295***	0.044***	0.311***	1.000		
<i>RE/TE</i>	0.039***	0.060***	-0.001	-0.245***	-0.230***	0.274***	0.355***	1.000	
<i>Lag_Ret</i>	-0.021***	-0.040***	0.051***	0.025***	-0.006***	0.008***	0.105***	0.018***	1.000

Notes: This table presents pairwise Pearson correlations between the main variables in the main tests. All variables are defined in the Appendix. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels respectively.

Table 3: The Cluster and Peer Influence in Share Repurchases

	(1)	(2)	(3)
	OLS	2SLS	
VARIABLES	<i>SR_ANN</i>	Stage 1 <i>Peer_SR_ANN_PERC</i>	Stage 2 <i>SR_ANN</i>
<i>Peer_SR_ANN_PERC</i>	0.217*** (15.33)		0.863* (1.87)
<i>Peer_Lag_Abnormal_Ret</i>		-0.011*** (-12.08)	
<i>Cash</i>	0.031*** (12.23)	0.001* (1.95)	0.031*** (11.88)
<i>Lev</i>	-0.002*** (-7.57)	-0.000*** (-4.27)	-0.002*** (-6.36)
<i>Size</i>	0.008*** (14.99)	0.000*** (3.61)	0.008*** (13.67)
<i>ROA</i>	0.046*** (12.30)	0.001 (1.53)	0.045*** (11.99)
<i>RE/TE</i>	-0.000*** (-5.78)	-0.000*** (-2.91)	-0.000*** (-5.15)
<i>Lag_Ret</i>	-0.014*** (-19.87)	-0.003*** (-22.53)	-0.012*** (-8.83)
Constant	-0.028*** (-8.53)	0.017*** (27.93)	-0.040*** (-4.67)
First-Stage F-statistic		224.285	
Observations	470,963	470,963	470,963
R-squared	0.064	0.281	0.063
Firm FE	YES	YES	YES
Year FE	YES	YES	YES
Firm Cluster	YES	YES	YES

Notes: This table shows the empirical results of the OLS and 2SLS regressions which test the cluster and peer influence in announcing share repurchases. In the OLS regression in Column (1), the dependent variable is *SR_ANN* which is an indicator that is equal to one if the firm announced share repurchase in that quarter, and zero otherwise. The independent variable is *Peer_SR_ANN_PERC* which is the percentage of peers announcing share repurchase in the same quarter. The stage 2 of the 2SLS regression runs the same equation (1) as the OLS regression. But in this regression. The independent variable of interest is the instrumented *Peer_SR_ANN_PERC* estimated by the instrument variable *Peer_Lag_Abnormal_Ret* which is the lagged abnormal return of the peers. Both firm and year fixed effects are included in all regressions and the standard errors are clustered at the firm level. The Appendix shows the definition of all other variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively and t-statistics are shown in parentheses.

Table 4: Valuation Analysis of Mimicking Share Repurchases

VARIABLES	(1) <i>Tobin_Q_Change</i>	(2) <i>Tobin_Q_Change</i>	(3) <i>Tobin_Q_Increase</i>	(4) <i>Tobin_Q_Increase</i>
<i>Peer_SR_ANN_PERC</i>	-0.138* (-1.94)		-0.895*** (-3.33)	
<i>SR_Alone</i>		0.013** (2.06)		0.058** (2.50)
<i>Cash</i>	-0.022 (-0.60)	-0.023 (-0.61)	0.017 (0.16)	0.012 (0.12)
<i>Lev</i>	0.006** (2.44)	0.006** (2.54)	0.008 (0.56)	0.010 (0.66)
<i>Size</i>	-0.017** (-2.34)	-0.017** (-2.35)	-0.040* (-1.82)	-0.041* (-1.87)
<i>ROA</i>	-0.110 (-0.59)	-0.107 (-0.57)	-0.654 (-1.49)	-0.633 (-1.44)
<i>RE/TE</i>	0.005 (0.65)	0.005 (0.72)	0.023 (1.09)	0.026 (1.22)
<i>Psought</i>	0.000 (1.26)	0.000 (1.24)	0.002* (1.69)	0.002* (1.68)
Constant	0.100** (2.06)	0.092* (1.90)	0.737*** (5.21)	0.699*** (4.91)
Observations	8,122	8,122	8,122	8,122
R-squared	0.547	0.547	0.477	0.477
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Firm Cluster	YES	YES	YES	YES

Notes: This table shows the empirical results of the valuation analysis of the outcome of mimicking share repurchases. In this test, only the firm-quarter observations in which the firm announced repurchase are included in the testing sample. In the OLS regressions in Columns (1) and (2), the dependent variable is *Tobin_Q_Change* which is the percentage change of the firm's Tobin's Q from the beginning of the quarter to the end of the quarter. And in Columns (3) and (4), the dependent variable is an indicator that is equal to 1 if the firm's Tobin's Q increased in that quarter. In Columns (1) and (3), the independent variable is *Peer_SR_ANN_PERC* which is the percentage of peers announcing share repurchase in the same quarter. And in Columns (2) and (4), the independent variable is *SR_Alone* which is a dummy variable which is equal to 1 if the share repurchase announcement is the only announcement among the firm's industry in the quarter, and 0 otherwise. Both firm and year fixed effects are included in all regressions and the standard errors are clustered at the firm level. The Appendix shows the definition of all other variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively and t-statistics are shown in parentheses.

Table 5: Managerial Ability and Managerial Herding in Share Repurchases

	(1)	(2)
	2SLS	
SUBSAMPLES	MA-Score_Low	MA-Score_High
VARIABLES	SR_ANN	SR_ANN
<i>Peer_SR_ANN_PERC</i>	1.472** (2.17)	-0.049 (-0.06)
<i>Cash</i>	0.038*** (9.61)	0.038*** (7.83)
<i>Lev</i>	-0.001*** (-3.43)	-0.002*** (-4.89)
<i>Size</i>	0.008*** (9.35)	0.012*** (10.53)
<i>ROA</i>	0.043*** (7.30)	0.053*** (7.36)
<i>RE/TE</i>	-0.000*** (-2.63)	-0.000*** (-3.41)
<i>Lag_Ret</i>	-0.009*** (-4.38)	-0.018*** (-7.51)
Constant	-0.052*** (-4.18)	-0.039*** (-2.67)
<i>Low-High p-value</i>		1.521*** 0.000
Observations	171,243	157,708
R-squared	0.076	0.074
Firm FE	YES	YES
Year FE	YES	YES
Firm Cluster	YES	YES

Notes: This table presents the results of the cross-sectional test based on managerial ability, which is measured by the MA-Score developed by Demerjian et al. (2012). The total sample is partitioned into subsamples of MA-Score_Low and MA-Score_High according the sample median in each year. The results of the second stage of 2SLS regressions are shown in both subsamples. In all regressions, firm and year fixed effects are included and standard errors are clustered at firm level. The Appendix shows the definition of all other variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively and t-statistics are shown in parentheses.

Table 6: External Monitoring and Managerial Herding in Share Repurchases

SUBSAMPLES VARIABLES	(1)	(2)
	2SLS	
	InstOwn_HHI_Low	InstOwn_HHI_High
	SR_ANN	SR_ANN
<i>Peer_SR_ANN_PERC</i>	1.480* (1.92)	-0.173 (-0.28)
<i>Cash</i>	0.046*** (8.43)	0.025*** (7.95)
<i>Lev</i>	-0.002*** (-4.56)	-0.001*** (-4.05)
<i>Size</i>	0.011*** (9.36)	0.006*** (7.31)
<i>ROA</i>	0.104*** (9.42)	0.032*** (7.90)
<i>RE/TE</i>	-0.000** (-2.02)	-0.000*** (-3.21)
<i>Lag_Ret</i>	-0.023*** (-9.31)	-0.009*** (-5.18)
Constant	-0.071*** (-4.65)	-0.008 (-0.70)
<i>Low-High p-value</i>		1.653*** 0.000
Observations	239,825	168,116
R-squared	0.062	0.087
Firm FE	YES	YES
Year FE	YES	YES
Firm Cluster	YES	YES

Notes: This table shows the cross-sectional test based on institutional ownership concentration, which stands for the monitoring effect of institutional investors in influencing corporate decisions. The Institutional ownership data is from the Thomson Reuters in the WRDS data platform. The subsamples of InstOwn_HHI_Low and InstOwn_HHI_High are assigned according to the sample median of firms' institutional ownership HHI in each quarter. The results of the second stage of 2SLS regressions are shown in both subsamples. In all regressions, firm and year fixed effects are included and standard errors are clustered at firm level. The results show that the managerial herding in share repurchase is more pronounced for firms with lower institutional ownership concentration, which indicates that when the institutional investor have higher monitoring effect, the managerial herding in share repurchase will be reduced. The Appendix shows the definition of all other variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively and t-statistics are shown in parentheses.

Table 7: Financial Constraints and Managerial Herding in Share Repurchases

SUBSAMPLES VARIABLES	(1)	(2)
	2SLS	
	Credit_Rating_NO	Credit_Rating_YES
	SR_ANN	SR_ANN
<i>Peer_SR_ANN_PERC</i>	0.327 (0.57)	2.764** (2.55)
<i>Cash</i>	0.033*** (11.14)	0.065*** (4.95)
<i>Lev</i>	-0.002*** (-5.71)	-0.001** (-1.98)
<i>Size</i>	0.010*** (13.77)	0.007*** (3.43)
<i>ROA</i>	0.034*** (7.82)	0.157*** (8.49)
<i>RE/TE</i>	-0.000*** (-4.77)	-0.000 (-1.07)
<i>Lag_Ret</i>	-0.014*** (-8.57)	-0.012*** (-3.46)
Constant	-0.036*** (-3.41)	-0.077*** (-3.22)
NO-YES		-2.437***
p-value		0.000
Observations	295,474	108,276
R-squared	0.071	0.068
Firm FE	YES	YES
Year FE	YES	YES
Firm Cluster	YES	YES

Notes: This table shows the additional test of the mitigation impact of financial constraints on managerial herding in share repurchases. The total sample is partitioned into subsamples based on firms' financial constraints which is measured by the existence of firms' crediting ratings. Firms without S&P credit ratings are regarded as financially constrained firms and are assigned to the subsample of Credit_Rating_NO. Firms with S&P credit ratings are assigned to the subsample of Credit_Rating_YES. The S&P credit rating data is from Compustat database. The results of the second stage of 2SLS regressions are shown in both subsamples. In all regressions, firm and year fixed effects are included and standard errors are clustered at firm level. The results show that firms with financial constraints are less likely to herd, which indicates that financial constraints can mitigate managerial herding in share repurchases. The Appendix shows the definition of all other variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively and t-statistics are shown in parentheses.

Table 8: Lead-Lag Analysis of Peer Influence in Share Repurchases

	(1)	(2)	(3)
	OLS	2SLS	
VARIABLES	<i>SR_ANN</i>	Stage 1 <i>Lag_Peer_SR_ANN_PERC</i>	Stage 2 <i>SR_ANN</i>
<i>Lag_Peer_SR_ANN_PERC</i>	0.111*** (8.94)		0.443* (1.78)
<i>Peer_Lag_Abnormal_Ret</i>		-0.020*** (-20.66)	
<i>Cash</i>	0.031*** (12.25)	0.000 (0.27)	0.031*** (12.21)
<i>Lev</i>	-0.002*** (-7.68)	-0.000*** (-3.10)	-0.002*** (-7.30)
<i>Size</i>	0.008*** (15.09)	0.000 (0.17)	0.008*** (15.04)
<i>ROA</i>	0.046*** (12.30)	0.002*** (3.51)	0.045*** (11.92)
<i>RE/TE</i>	-0.000*** (-5.88)	-0.000 (-0.94)	-0.000*** (-5.80)
<i>Lag_Ret</i>	-0.014*** (-19.96)	-0.004*** (-38.05)	-0.012*** (-9.27)
Constant	-0.027*** (-8.02)	0.019*** (31.76)	-0.033*** (-5.75)
First-Stage F-statistic		767.264	
Observations	470,704	470,704	470,704
R-squared	0.063	0.274	0.063
Firm FE	YES	YES	YES
Year FE	YES	YES	YES
Firm Cluster	YES	YES	YES

Notes: This table shows the empirical results of the lead-lag analysis of the peer influence in share repurchases by taking lag of the independent variable *Peer_SR_ANN_PERC*. In the OLS regression in Column (1), the dependent variable is *SR_ANN* which is an indicator that is equal to 1 if the firm announced share repurchase in that quarter, and 0 otherwise. The independent variable is *Lag_Peer_SR_ANN_PERC* which is the percentage of peers announcing share repurchases in the prior quarter. Due to this lag term, the observations are reduced compared to the original sample. The stage 2 of the 2SLS regression runs the same regression as the OLS regression in column (1). But in this regression. The independent variable of interest is the instrumented *Lag_Peer_SR_ANN_PERC* estimated by the instrument variable *Peer_Lag_Abnormal_Ret* which is the lagged abnormal return of the peers. Both firm and year fixed effects are included in all regressions and the standard errors are clustered at the firm level. The Appendix shows the definition of all other variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively and t-statistics are shown in parentheses.

Appendix
Variable Definitions

Variable	Definition
<i>SR_ANN</i>	Dummy variable that is equal to 1 if the firm announced share repurchase in this quarter, and 0 otherwise.
<i>Peer_SR_ANN_PERC</i>	The percentage of the firm's peers that announced share repurchase in this quarter. Peers are defined as other firms that belong to the same SIC3 industry as the focal firm.
<i>Peer_Lag_Abnormal_Ret</i>	The average of the peers' abnormal return in the previous quarter. The expected return of peers is calculated by using the asset pricing model that includes the market factor and industry peer factor. For detailed calculations please refer to the main text.
<i>Cash</i>	Cash holdings of the focal firm. Cash and short-term investments at the beginning of the quarter divided by the total assets at the beginning of the quarter.
<i>Lev</i>	Leverage of the focal firm. Long-term debt at the beginning of the quarter divided by the total equity at the beginning of the quarter.
<i>Size</i>	Firm size of the focal firm. The logarithm of the total assets at the beginning of the quarter.
<i>ROA</i>	Net income divided by the total assets at the beginning of the quarter.
<i>RE/TE</i>	Retained earnings to total equity ratio of the focal firm. Retained earnings at the beginning of the quarter divided by the total equity at the beginning of the quarter.
<i>Lag_Ret</i>	The buy-and-hold stock return of the focal firm in the previous quarter.
<i>Psought</i>	The percentage of outstanding shares sought to be repurchased by the firm at the repurchase announcement.
<i>Tobin_Q_Change</i>	The percentage change of the firm's Tobin's Q during the repurchasing quarter.
<i>Tobin_Q_Increase</i>	Dummy variable that is equal to 1 if the firm's Tobin's Q increased during the repurchasing quarter, and 0 otherwise.
<i>SR_Alone</i>	Dummy variable that is equal to 1 if the share repurchase is made without any peer announcing share repurchase in the same quarter, and 0 otherwise.
<i>InstOwn_HHI</i>	Institutional ownership concentration which is the HHI index of a firms' all institutional onwerships.
<i>MA-Score</i>	MA-Score, which is the managerial efficiency developed by Demerjian et al. (2012).
<i>Lag_Peer_SR_ANN_PERC</i>	The lag-1 term of <i>Peer_SR_ANN_PERC</i> . That is the percentage of the firm's peers that announced share repurchase in prior quarter.