

# 企業商業交易關係及股票購回之資訊效果對股東財富的影響

## Business Relationship and Information Effects of Share Repurchases on Stockholders' Wealth

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## 摘要

本研究利用 2003 年至 2008 年間美國市場資料來探討公司股票購回所引起的資訊效果，及公司與上下游商業對手之資訊不對稱程度的改變對公司股東財富的影響。實證結果顯示公司在股票購回宣告後，本身的資訊不對稱程度會降低，因此使公司股東的財富增加（資訊溢酬效果）。然而，在公司本身的資訊不對稱程度降低的同時，亦提高了上下游商業交易對手的相對資訊優勢，此對公司股東將造成負面影響。本研究發現相對資訊優勢效果會抵消因公司資訊不對稱程度降低所帶來的資訊溢酬效果，此現象尤其在供應鏈上游更顯著。

**關鍵詞：** 股票購回、資訊效果、商業交易對手、相對資訊優勢效果、股東財富

## Abstract

Using U.S. data from 2003 to 2008, this study explores the information effects of the changes in information asymmetry of repurchasing firms and their business counterparties due to share repurchases on repurchasing firms' stockholders' wealth. We find that the information asymmetry of repurchasing firms decreases after repurchase announcements, which enhances their stockholders' wealth (information premium effect). However, the information premium effect is offset by the relative information advantages gained by repurchasing firms' business counterparties (relative information advantage effect), especially by their suppliers.

**Keywords:** Share repurchases, Information effect, Business counterparties, Relative information advantage effect, Stockholders' wealth

# 1. INTRODUCTION

The significant stock price impact of share repurchase announcements is well documented in the empirical finance literature. Two of the most prevalent hypotheses explaining this significant reaction are the signaling hypothesis (Vermaelen, 1981) and the free cash flow hypothesis (Jensen, 1986). Both hypotheses posit that a firm may use share repurchases as a signal to overcome the information asymmetry that exists between managers and stockholders, which benefits stockholders' wealth (information premium effect). On the other hand, the information flow within business counterparties is an important mechanism for business activities since a firm often benefits more by the information advantage relative to its business counterparties in business transactions. The decline in a repurchasing firm's information asymmetry after a repurchase announcement may cause the firm in a position of information disadvantage relative to its business counterparties, which impairs the firm's stockholders' wealth (relative information advantage effect). Few existing studies explore the changes in firms' information asymmetry before and after repurchasing announcements and the information effects on their stockholder's wealth. The main purpose of this paper therefore is to examine whether a firm's degree of information asymmetry declines after a repurchase announcement and the information effects of the changes in information asymmetry of the repurchasing firm and its business counterparties on stockholder's wealth.

More specifically, the signaling hypothesis suggests that managers with private information of future cash flows repurchase shares to convey information about an undervaluation of the stock (Vermaelen, 1981), foresight of superior future profitability (Dann, 1981), or upward revision of market expectations (Hertzel & Jain, 1991) to the financial markets. On the other hand, the free cash flow hypothesis suggests that share repurchases convey the information that firms mitigate potential waste of free cash by management in response to deterioration in investment opportunities (Jensen, 1986). Extant literature confirms both the signaling hypothesis and the free cash flow hypothesis, and shows the positive

effect of repurchase announcements on stock returns. Therefore, a repurchase program may release firm value information, leading to a decline in the repurchasing firm's information asymmetry. This reduction in the repurchasing firm's information asymmetry may decrease the required returns of stockholders since investors demand a lower return to hold stocks with less private information (Easley & O'Hara, 2004). Thus, stockholders benefit from the positive information impact of the decline in the repurchasing firm's information asymmetry due to share repurchases (information premium effect).

Besides, within a business relationship, a firm with lower degree of information asymmetry than its business counterparty has information disadvantage. Though the decline of a firm's information asymmetry after a repurchase announcement benefits stockholders (information premium effect), the decrease of the repurchasing firm's information asymmetry would be favorable for its business counterparties as repurchase announcements may enhance the relative information advantages of its business counterparties (relative information advantage effect). As a result, a repurchasing firm's inventory flow and cash flow risks increase along with the relative information advantages of its business counterparties, which is harmful to its stockholders' wealth. This study broadens the investigation by examining the information effects of the changes in information asymmetry of repurchasing firms and their business counterparties (that is, suppliers and customers) around repurchases announcements on stockholders' wealth.

Within a business relationship, the variations of business counterparties' inventory flows, cash flows and information flows may be transmitted to a firm. Among these three flows, the information flow is the most emphasized in literature because it deeply affects a firm's inventory behavior (Blinder, 1986; West, 1986; Kahn, 1987)<sup>1</sup> and therefore its cash flow variation (Tsai, 2008)<sup>2</sup>. Chopra & Meindl

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<sup>1</sup> Blinder (1986) and West (1986) document that inventory behaviors include the excess volatility of production phenomenon. Kahn (1987) also presents the production counter-smoothing hypothesis to explain the stylized fact associated with inventory behavior that the variance of production exceeds the variance of sales with demand uncertainty.

<sup>2</sup> Tsai (2008) described their relationship by employing cash conversion cycle to variations and provided an insightful look at supply chain cash flow risks.

(2001) point out that the information flow is the most important driver to improve the value of supplier/customer relationship. Moreover, Chen et al. (2013) put their emphasis on the importance of the information flow in business relationships, and find that both suppliers' and customers' information asymmetry effects significantly explain a firm's bond yield spreads. Thus, the information flow is a critical determinant of the visibility of a firm's asset value distribution. Duffie & Lando (2001) contend that incomplete accounting information contributes to an imprecise knowledge of firm value. Accordingly, this study conjectures that the changes in the position of the information advantage between a repurchasing firm and its business counterparties influence its asset value and hence its stockholders' wealth. Besides, Raghunathan (2001) contends that because suppliers could extract demand information from order information given by their customers when demands are stationary, a repurchasing firm tends to be less influenced by its customers' information asymmetry. The current study expects that the suppliers' relative information advantage effect is more significant.

This study employs a sample of 523 repurchasing firms (where 189 firms have at least one supplier and 90 firms have at least one customer) from 2003 to 2008 to investigate the impact of share repurchases on stockholders' wealth from the perspective of information asymmetry. That is, we examine whether a firm's degree of information asymmetry declines after a repurchase announcement and whether the changes of information asymmetry of the repurchasing firm and its business counterparties (suppliers and customers) significantly affect its abnormal equity returns when controlling for well-known variables, such as repurchase size, firm size, return on assets, and leverage ratio. To measure the degree of information asymmetry, this study uses a well-known proxy, the probability of information-based trading estimated by an extended PIN model (ADJPIN) (Duarte & Young, 2009), a larger ADJPIN indicating more severe conflicts of interests between informed traders and uninformed traders. In addition, this paper uses the proxy for stock performance is the abnormal equity returns (AER), known as cumulative abnormal returns (CAR).

Empirical results of this study show that on average information asymmetry of repurchasing firms significantly decreases 0.0041 after repurchase announcements

to the following three months. When controlling for well-known variables, this decline in information asymmetry of repurchasing firms after repurchase announcements enhances stockholders' wealth by 0.8155 per unit decrease in information asymmetry of repurchasing firms during the period of (0,3) (namely information premium effect). In addition, the results reveal that given the decline in information asymmetry of repurchasing firms, information asymmetry of their suppliers decreases stockholders' wealth 0.3717 during the period of (0,3) (namely relative information advantage effect). Moreover, the results also illustrate that the relative information advantage effect of suppliers dominates the information premium effect of repurchasing firms. Furthermore, information asymmetry of customers has a less significant effect than that of suppliers on stockholders' wealth, consistent with Raghunathan (2001). These consequences exhibit the importance of the information flow within business counterparties.

The remainder of this paper is organized as follows. Section II presents the hypotheses. Section III describes sample selection criteria and introduces the methodology of measuring major variables used in the empirical examinations. Section IV presents and analyzes empirical results. Finally, Section V offers concluding remarks.

## **2. HYPOTHESES**

This section proposes hypotheses on how a firm's information asymmetry changes around the repurchase announcement, and how information asymmetry of the repurchasing firm and its business counterparties affect the wealth of its stockholders. The following presents these hypotheses and briefly states their literature backgrounds.

*Hypothesis 1: The degree of information asymmetry of a firm declines after a repurchase announcement.*

The signaling hypothesis contends that management uses open market share repurchases to signal better prospects of a firm when markets are incomplete. It demonstrates that share repurchase decisions release information about an undervaluation of the stock (Vermaelen, 1981), future earnings and profitability of firms (Dann, 1981), or upward revision of market expectations (Hertzel & Jain, 1991) to the financial markets. Alternatively, the free cash flow hypothesis argues that share repurchases convey the information that firms reduce the amount of free cash available for management disposal (Jensen, 1986). Both hypotheses posit that a firm may use share repurchases to mitigate the information asymmetry that exists between managers and stockholders. Therefore, the degree of information asymmetry of a repurchasing firm decreases after a repurchase announcement.

*Hypothesis 2: (Information premium effect) The decline in the degree of information asymmetry of a repurchasing firm after a repurchase announcement reduces the required returns of its stockholders, and then increases their wealth. (That is, the decline in information asymmetry of the repurchasing firm has a positive effect on its abnormal equity return (AER)).*

Easley & O'Hara (2004) demonstrate that investors demand a higher return to hold stocks with greater private information and Lu et al. (2010) show that investors charge a significant risk premium for both information uncertainty and information asymmetry. Hence, the reduction of a repurchasing firm's information asymmetry lowers the required returns of investors and has a positive impact on the abnormal equity return, benefiting its stockholders.

*Hypothesis 3: (Relative information advantage effect) The decline in the degree of information asymmetry of a repurchasing firm after a repurchase announcement enhances the relative information advantages of its business counterparties (i.e. suppliers and customers), and then impairs the wealth of its stockholders. (That is, given the decline in information asymmetry of the repurchasing firm, information asymmetry of its business counterparties has a negative effect on its abnormal equity return (AER)).*

After a repurchase announcement, the decrease of a repurchasing firm's information asymmetry strengthens the relative information advantages of its business counterparties. According to Blinder (1986), West (1986), and Kahn (1987), the inventory flow risk of a repurchasing firm increases with the information advantages of its business counterparties, which augments its cash flow risk (Tsai, 2008) and therefore impairs its equity value. Consequently, the reduction of the repurchasing firm's information asymmetry weakens its information advantage relative to its business counterparties, which has a negative impact on the abnormal equity return.

### **3. DATA AND METHODOLOGY**

This section discusses the identification of a sample of share repurchases, describes the methodology used to calculate abnormal equity returns (AER) and the proxy for information asymmetry, lists well-known control variables of repurchase events, and shows the sample distribution by year and the descriptive statistics for the variables.

#### **3.1 Sample Selection**

After removing the companies in financial industries (SIC codes of 6000-6999) and not listed on COMPUSTAT and CRSP, we obtain a sample of 523 repurchase announcements during 2003-2008 from the Securities Data Company (SDC) mergers and acquisitions database. We collect information on the percentage of shares announced to repurchase at the initial date from the SDC, and extract the financial statement data from the COMPUSTAT industrial annual database and the equity market and return data from the Center for Research in Securities Prices (CRSP) database. The event date is defined as the date that a share repurchase is first announced to the public.

Following the approaches of Fee & Thomas (2004) and Kale & Shahrur (2007), we identify a firm's suppliers and customers by using the COMPUSTAT industry segment files database to examine the information asymmetry effects of suppliers and customers on the abnormal equity returns (AER). Table 1 provides the distribution of repurchase events by year. The final sample includes 523 repurchase announcements where 189 firms have at least one supplier and 90 firms have at least one customer from 2003 to 2008.

**Table 1. Sample size**

This table provides the distribution of repurchase events by year. The second column gives all the announcements of repurchase programs between 2003 and 2008 from the Securities Data Company (SDC) mergers and acquisitions database. The last two columns present the number of repurchasing firms with at least one supplier or customer, respectively. The sample from 2003 to 2008 includes 523, 189, and 90 observations for all firms, firms with suppliers and firms with customers, respectively.

<b>Year</b>	<b>Number of repurchases</b>	<b>Firms with suppliers</b>	<b>Firms with customers</b>
2003	36	11	8
2004	71	32	10
2005	107	45	24
2006	95	33	11
2007	134	49	25
2008	80	19	12
Total	523	189	90

### **3.2 Abnormal Equity Returns (AER)**

This study follows the methodology of Maxwell & Stephens (2003) using the market model with the CRSP equally weighted index as the market portfolio on a daily basis to calculate daily abnormal equity returns. We compute the daily equity returns for each firm by the gross stock prices obtained from the CRSP. Then, the daily equity return minus the CRSP equally weighted index generates the daily abnormal equity returns.

### 3.3 The Proxy for Information Asymmetry

Easley et al. (1996) develop the first market measure for information asymmetry, the probability of information-based trading (PIN), extracted from an asset's bid and ask trading prices. Duarte & Young (2009) provide an extended PIN model that more precisely captures information asymmetry of a firm by effectively decomposing the original PIN into two components, one related to information asymmetry, and the other related to illiquidity. Therefore, this study employs the extended PIN model to measure information asymmetry (ADJPIN) by calculating the ratio of expected informed orders to the total expected order flow shown as follows.

$$ADJPIN = \frac{a \times (d \times u_b + (1-d) \times u_s)}{a \times (d \times u_b + (1-d) \times u_s) + (\Delta_b + \Delta_s) \times (a \times \theta' + (1-a) \times \theta) + \varepsilon_s + \varepsilon_b} \quad (1)$$

Where  $a$  indicates the probability of the occurrence of a private information event on a given day,  $d$  ( $1-d$ ) denotes the conditional probability of the occurrence of a positive (negative) private information event, and  $u_b$  and  $u_s$  are the numbers of buyer- and seller-initiated informed trades, respectively. In the event of symmetric order-flow shock, the probability conditional on the absence (arrival) of private information is represented by  $\theta$  ( $\theta'$ ) and the additional arrival rate of buys is  $\Delta_b$  and sells is  $\Delta_s$ . Buys arrive at a rate of  $\varepsilon_b$  and sells arrive at a rate of  $\varepsilon_s$  when there is no private information. A larger ADJPIN indicates higher information asymmetry, the conflicting interests of informed traders and uninformed traders causing a firm's value distribution to become more volatile.

This study uses the intraday data from the NYSE Trade and Quote (TAQ) database to compute the number of buyer- and seller-initiated trades for each day, and select trades and quotes by the methods of Lee & Ready (1991), Chordia et al. (2002), and Duarte & Young (2009).<sup>3</sup> Then, we employ the EM algorithm of Chen

<sup>3</sup> This study excludes all trades and quotes that occur before the open and at the open, as well as those at the close and after the close. To eliminate possible data errors, we also exclude all quotes with zero bid and ask prices, quotes for which the bid-ask spread is greater than 50% of the price, and trades with zero prices. We employ the Lee & Ready (1991) algorithm to sign the trades by a tick test when trades occur at the mid-point of the bid and ask prices.

& Chung (2007) to estimate the ADJPIN on a monthly basis.

Since a firm may have more than one supplier or customer for a given year, we construct a weighted average of the information asymmetry of suppliers or customers ( $S\_ADJPIN$  or  $C\_ADJPIN$ ) for firm  $k$  as follows:

$$S\_ADJPIN_k = \sum_{j=1}^n S\_ADJPIN_j \times S\_w_j \quad (2)$$

$$C\_ADJPIN_k = \sum_{j=1}^m C\_ADJPIN_j \times C\_w_j \quad (3)$$

where  $n$  is the number of suppliers,  $S\_ADJPIN_j$  is the information asymmetry of  $j$ th supplier,  $S\_w_j$  is the relative market value weight of  $j$ th supplier to the total market value of all suppliers,  $m$  is the number of customers,  $C\_ADJPIN_j$  is the information asymmetry of  $j$ th customer, and  $C\_w_j$  is the relative market value weight of  $j$ th customer to the total market value of all customers.

### 3.4 Control Variables

To examine the proposed hypotheses, we control other primary variables and cross-sectional determinants of abnormal returns in the literature regarding share repurchases: repurchase size, firm size, return on assets, and leverage ratio. PctofRepurchase (repurchase size) is the percentage of shares announced at first announcement date over total outstanding shares. LnAsset (firm size) is the logarithm of a firm's total assets. ROA (return on assets) is the ratio of operating income over total assets. LEV (leverage ratio) is calculated as debt (in book value) divided by the sum of debt (in book value) and equity (in market value). The book value of debt is "long-term debt" plus "debt in current liabilities," and the market value of equity is the number of shares outstanding multiplied by share price.

### 3.5 Descriptive Statistics for Variables

Table 2 summarizes the statistics of variables used in this study. The average

values of control variables are associated with repurchase size of 7.91%, firm size of 8.94, return on assets of 6.53%, and leverage ratio of 24.90%.

ADJPIN is an information asymmetry proxy developed by Duarte & Young (2009) where ADJPIN<sub>0</sub> represents ADJPIN for the announcement month, and ADJPIN-3, ADJPIN-2, ADJPIN-1 (ADJPIN+3, ADJPIN+2, ADJPIN+1) mean ADJPIN for 3 months, 2 months and 1 month before (after) the repurchase announcement month, respectively. F\_ADJPIN, S\_ADJPIN, and C\_ADJPIN stand for ADJPIN of repurchasing firms, suppliers, and customers, respectively. The average values of information asymmetry variables are associated with F\_ADJPIN-3 of 0.0317 (0.0877 for suppliers and 0.0146 for customers), F\_ADJPIN-2 of 0.0305 (0.0821 for suppliers and 0.0138 for customers), F\_ADJPIN-1 of 0.0310 (0.0852 for suppliers and 0.0128 for customers), F\_ADJPIN<sub>0</sub> of 0.0320 (0.0835 for suppliers and 0.0109 for customers), F\_ADJPIN+1 of 0.0300 (0.0833 for suppliers and 0.0127 for customers), F\_ADJPIN+2 of 0.0279 (0.0803 for suppliers and 0.0132 for customers), and F\_ADJPIN+3 of 0.0274 (0.0800 for suppliers and 0.0132 for customers).

Table 3 and Table 4 provide the correlation coefficient matrices of the major variables for suppliers and customers, respectively. Both reveal that the correlations between information asymmetry of suppliers/customers and other control variables are not substantial. The initial results show that supplier' and customers' information asymmetry may contain additional information than other main variables.

**Table 2. Descriptive statistics**

This table reports the descriptive statistics for the sample of open market repurchase programs from 2003 to 2008. PctofRepurchase is the percentage of shares announced over total outstanding shares. LnAsset is the logarithm of a firm's total assets. ROA is the ratio of operating income over total assets. LEV is the leverage ratio, calculated as debt (in book value) divided by the sum of debt (in book value) and equity (in market value). The book value of debt is "long-term debt" plus "debt in current liabilities," and the market value of equity is the number of shares outstanding multiplied by share price. ADJPIN is an information asymmetry proxy developed by Duarte & Young (2009) where ADJPIN-3, ADJPIN-2, ADJPIN-1 represent ADJPIN for 3 months, 2 months and 1 month before the repurchase announcement month, ADJPIN0 represent ADJPIN for the announcement month, and ADJPIN+1, ADJPIN+2, ADJPIN+3 represent ADJPIN for 1 month, 2 months and 3 months after the repurchase announcement month, respectively. F\_ADJPIN, S\_ADJPIN, and C\_ADJPIN stand for ADJPIN of repurchasing firms, suppliers, and customers, respectively.

Variable	Mean	Median	Standard deviation	Minimum	Maximum
<b>Panel A. Information asymmetry and other variables of firms (N = 523)</b>					
PctofRepurchase	7.9122	6.1650	9.6721	0.0000	151.4840
LnAsset	8.9409	8.9148	1.2248	5.3932	12.5269
ROA	0.0653	0.0630	0.0608	-0.3260	0.2941
LEV	0.2490	0.2089	0.1675	0.0064	0.9019
F_ADJPIN -3	0.0317	0.0195	0.0387	0.0000	0.2654
F_ADJPIN -2	0.0305	0.0171	0.0382	0.0000	0.2817
F_ADJPIN -1	0.0310	0.0165	0.0404	0.0000	0.2576
F_ADJPIN 0	0.0320	0.0178	0.0410	0.0000	0.2640
F_ADJPIN +1	0.0300	0.0168	0.0404	0.0000	0.2825
F_ADJPIN +2	0.0279	0.0160	0.0366	0.0000	0.2455
F_ADJPIN +3	0.0274	0.0152	0.0372	0.0000	0.2574
<b>Panel B. Information asymmetry of suppliers (N = 189)</b>					
S_ADJPIN -3	0.0877	0.0658	0.0764	0.0000	0.3470
S_ADJPIN -2	0.0821	0.0631	0.0729	0.0000	0.3694
S_ADJPIN -1	0.0852	0.0606	0.0748	0.0000	0.3338
S_ADJPIN 0	0.0835	0.0559	0.0802	0.0000	0.4551
S_ADJPIN +1	0.0833	0.0674	0.0727	0.0000	0.3076
S_ADJPIN +2	0.0803	0.0583	0.0698	0.0000	0.3178
S_ADJPIN +3	0.0800	0.0576	0.0048	0.0000	0.2992
<b>Panel C. Information asymmetry of customers (N = 90)</b>					
C_ADJPIN -3	0.0146	0.0000	0.0329	0.0000	0.1633
C_ADJPIN -2	0.0138	0.0000	0.0311	0.0000	0.2000
C_ADJPIN -1	0.0128	0.0000	0.0299	0.0000	0.2000
C_ADJPIN 0	0.0109	0.0000	0.0280	0.0000	0.2000
C_ADJPIN +1	0.0127	0.0000	0.0315	0.0000	0.2000
C_ADJPIN +2	0.0132	0.0000	0.0289	0.0000	0.2000
C_ADJPIN +3	0.0132	0.0000	0.0308	0.0000	0.2000

**Table 3. Correlation coefficient matrix among suppliers' information asymmetry and other control variables**

This table displays the correlation coefficient matrix among information asymmetry proxy of suppliers and other major variables during the sample period (2003-2008). PctofRepurchase is the percentage of shares announced over total outstanding shares. LnAsset is the logarithm of a firm's total assets. ROA is the ratio of operating income over total assets. LEV is the leverage ratio, calculated as debt (in book value) divided by the sum of debt (in book value) and equity (in market value). The book value of debt is "long-term debt" plus "debt in current liabilities," and the market value of equity is the number of shares outstanding multiplied by share price. ADJPIN is an information asymmetry proxy developed by Duarte & Young (2009) where ADJPIN-3, ADJPIN-2, ADJPIN-1 represent ADJPIN for 3 months, 2 months and 1 month before the repurchase announcement month, ADJPIN0 represent ADJPIN for the announcement month, and ADJPIN+1, ADJPIN+2, ADJPIN+3 represent ADJPIN for 1 month, 2 months and 3 months after the repurchase announcement month, respectively. F\_ADJPIN and S\_ADJPIN stand for ADJPIN of repurchasing firms and suppliers, respectively.

	Pctof Repurchase	LnAsset	ROA	LEV	F_ ADJPIN-3	F_ ADJPIN-2	F_ ADJPIN-1	F_ ADJPIN0	F_ ADJPIN+1	F_ ADJPIN+2	F_ ADJPIN+3	S_ ADJPIN-3	S_ ADJPIN-2	S_ ADJPIN-1	S_ ADJPIN0	S_ ADJPIN+1	S_ ADJPIN+2	S_ ADJPIN+3																			
PctofRepurchase	1.0000																																				
LnAsset	-0.1436	1.0000																																			
ROA	0.0137	-0.2017	1.0000																																		
LEV	0.0226	0.1023	-0.4878	1.0000																																	
F_ADJPIN-3	0.0536	-0.4742	-0.0445	0.2378	1.0000																																
F_ADJPIN-2	0.0323	-0.5132	-0.0269	0.1331	0.8077	1.0000																															
F_ADJPIN-1	0.0162	-0.4881	-0.0721	0.1587	0.6805	0.7646	1.0000																														
F_ADJPIN0	0.0906	-0.4790	-0.1018	0.2087	0.6920	0.6864	0.7531	1.0000																													
F_ADJPIN+1	0.0499	-0.4682	-0.0106	0.0934	0.5942	0.6572	0.6675	0.7979	1.0000																												
F_ADJPIN+2	0.0935	-0.4283	-0.1066	0.1418	0.5215	0.5819	0.5294	0.5849	0.6875	1.0000																											
F_ADJPIN+3	0.1063	-0.4552	-0.0511	0.1686	0.6107	0.6062	0.5395	0.5638	0.5916	0.6693	1.0000																										
S_ADJPIN-3	0.2067	-0.2165	0.0964	0.0183	0.2105	0.0731	0.1482	0.0696	0.0939	0.0307	0.1182	1.0000																									
S_ADJPIN-2	0.1054	-0.1785	0.0937	0.0347	0.2133	0.0501	0.1129	0.0295	0.0529	0.0486	0.1420	0.8068	1.0000																								
S_ADJPIN-1	0.1413	-0.2037	0.0833	0.0216	0.1863	0.0420	0.1217	0.0479	0.0817	0.0377	0.1092	0.8401	0.8029	1.0000																							
S_ADJPIN0	0.1627	-0.1636	0.0796	0.1003	0.2284	0.0761	0.1475	0.0875	0.0888	0.0063	0.1075	0.8264	0.7652	0.7889	1.0000																						
S_ADJPIN+1	0.1704	-0.1916	0.1559	0.0371	0.2539	0.0982	0.1537	0.1235	0.1188	0.0088	0.1097	0.8467	0.7906	0.8274	0.8603	1.0000																					
S_ADJPIN+2	0.1312	-0.2483	0.1436	-0.0133	0.1944	0.0611	0.1551	0.0778	0.1133	0.0628	0.0833	0.8135	0.7054	0.7928	0.7871	0.8344	1.0000																				
S_ADJPIN+3	0.1761	-0.1928	0.0527	0.0489	0.2055	0.0920	0.1504	0.0956	0.0859	0.0985	0.1212	0.7777	0.7623	0.8005	0.7748	0.7676	0.8009	1.0000																			

**Table 4. Correlation coefficient matrix among customers' information asymmetry and other control variables**

This table displays the correlation coefficient matrix among information asymmetry proxy of customers and other major variables during the sample period (2003-2008). PctofRepurchase is the percentage of shares announced over total outstanding shares. LnAsset is the logarithm of a firm's total assets. ROA is the ratio of operating income over total assets. LEV is the leverage ratio, calculated as debt (in book value) divided by the sum of debt (in book value) and equity (in market value). The book value of debt is "long-term debt" plus "debt in current liabilities," and the market value of equity is the number of shares outstanding multiplied by share price. ADJPIN is an information asymmetry proxy developed by Duarte & Young (2009) where ADJPIN-3, ADJPIN-2, ADJPIN-1 represent ADJPIN for 3 months, 2 months and 1 month before the repurchase announcement month, ADJPIN0 represent ADJPIN for the announcement month, and ADJPIN+1, ADJPIN+2, ADJPIN+3 represent ADJPIN for 1 month, 2 months and 3 months after the repurchase announcement month, respectively. F, ADJPIN and C, ADJPIN stand for ADJPIN of repurchasing firms and customers, respectively.

	Pctof Repurchase	LnAsset	ROA	LEV	F_ ADJPIN-3	F_ ADJPIN-2	F_ ADJPIN-1	F_ ADJPIN0	F_ ADJPIN+1	F_ ADJPIN+2	F_ ADJPIN+3	C_ ADJPIN-3	C_ ADJPIN-2	C_ ADJPIN-1	C_ ADJPIN0	C_ ADJPIN+1	C_ ADJPIN+2	C_ ADJPIN+3		
PctofRepurchase	1.0000																			
LnAsset	0.0742	1.0000																		
ROA	-0.0792	0.1616	1.0000																	
LEV	0.0527	-0.1443	-0.3895	1.0000																
F_ADJPIN-3	-0.0200	-0.5411	-0.2495	0.3131	1.0000															
F_ADJPIN-2	0.0467	-0.6567	-0.1821	0.2756	0.7828	1.0000														
F_ADJPIN-1	-0.0306	-0.6817	-0.2214	0.3768	0.7009	0.7638	1.0000													
F_ADJPIN0	-0.0479	-0.6559	-0.2331	0.3668	0.6897	0.7356	0.8373	1.0000												
F_ADJPIN+1	-0.0879	-0.6308	-0.2004	0.3730	0.6098	0.7015	0.7998	0.8311	1.0000											
F_ADJPIN+2	0.0327	-0.5282	-0.2087	0.4424	0.4535	0.6143	0.7500	0.6894	0.8011	1.0000										
F_ADJPIN+3	-0.1323	-0.6317	-0.3452	0.3760	0.6053	0.6364	0.7833	0.7440	0.7681	0.8178	1.0000									
C_ADJPIN-3	-0.2230	-0.1276	-0.1634	-0.1085	0.1188	0.0890	0.1536	0.1564	0.2266	0.1561	0.2501	1.0000								
C_ADJPIN-2	-0.2906	-0.1375	-0.0857	-0.0945	0.1023	0.0924	0.1301	0.1221	0.2403	0.1180	0.1876	0.8935	1.0000							
C_ADJPIN-1	-0.3054	-0.0738	-0.0486	-0.1244	0.0624	0.0456	0.0932	0.1125	0.2092	0.0888	0.1410	0.8723	0.9450	1.0000						
C_ADJPIN0	-0.2782	-0.0553	-0.0319	-0.1114	0.0264	0.0270	0.0554	0.0606	0.1776	0.0509	0.0675	0.8182	0.8867	0.9528	1.0000					
C_ADJPIN+1	-0.3233	-0.0766	-0.0621	-0.1082	0.0810	0.0534	0.0904	0.1049	0.2072	0.0946	0.1500	0.8613	0.9061	0.9599	0.9635	1.0000				
C_ADJPIN+2	-0.3218	-0.1657	-0.0274	-0.0998	0.0856	0.0997	0.1252	0.1673	0.2866	0.1441	0.1943	0.8111	0.9085	0.9290	0.8676	0.9040	1.0000			
C_ADJPIN+3	-0.2591	-0.141	-0.1686	-0.041	0.1136	0.1074	0.1405	0.1854	0.2882	0.1454	0.2501	0.868	0.9105	0.9259	0.8855	0.9006	0.9313	1.0000		

Table 5 exhibits the averages of abnormal equity returns (AER) with associated significance tests during different time windows before and after share repurchase announcements. The announcement date of a repurchase is time 0. AER (-N, M) denotes the abnormal equity return from N days before the announcement date to M days after the announcement date. In general, we find that abnormal equity returns are significantly positive in the event windows of (-1,1), (-2,2), (-3,3), (-4,4), (-5,5), and (-10,10), and after repurchase announcements. These positive stock price reactions to the open market repurchase announcements are consistent with prior research (Dann, 1981; Vermaelen, 1981; Comment & Jarrell, 1991; Ikenberry et al., 1995; Stephens & Weisbach, 1998; Maxwell & Stephens, 2003).

**Table 5. Abnormal equity returns on the announcements of repurchases**

This table documents the averages of cumulative abnormal equity returns (AER) with associated significance tests during different time windows. The announcement date of a repurchase is time 0. AER (-N, M) denotes the cumulative abnormal equity returns from N days before the announcement date to M days after the announcement date. Associated t-statistics are reported right beneath the mean of cumulative abnormal equity returns. The signs of \*, \*\*, \*\*\* represent the significance of 10%, 5%, and 1%, respectively.

<b>Time Window</b>	<b>AER</b>	<b>Time Window</b>	<b>AER</b>	<b>Time Window</b>	<b>AER</b>
(-1,0)	0.0067 (3.7069)***	(0,1)	0.0130 (5.7903)***	(-1,1)	0.0122 (5.4205)***
(-2,0)	0.0052 (2.4833)**	(0,2)	0.0148 (6.2663)***	(-2,2)	0.0125 (4.5592)***
(-3,0)	0.0045 (2.0778)**	(0,3)	0.0164 (6.4488)***	(-3,3)	0.0135 (4.6979)***
(-4,0)	0.0039 (1.6992)*	(0,4)	0.0172 (6.4294)***	(-4,4)	0.0136 (4.7056)***
(-5,0)	0.0034 (1.4453)	(0,5)	0.0185 (7.0078)***	(-5,5)	0.0144 (5.1129)***
(-10,0)	-0.0013 (-0.4133)	(0,10)	0.0208 (6.6384)***	(-10,10)	0.0121 (3.2232)***
(-20,0)	-0.0050 (-1.2235)	(0,20)	0.0197 (4.9928)***	(-20,20)	0.0071 (1.3602)
(-40,0)	-0.0192 (-3.3789)***	(0,40)	0.0165 (3.3293)***	(-40,40)	-0.0100 (-1.3279)
(-60,0)	-0.0257 (-3.9812)***	(0,60)	0.0150 (2.2220)**	(-60,60)	-0.0168 (-1.8991)*

## 4. EMPIRICAL RESULTS

This section empirically examines hypotheses proposed in Section II: how the degree of information asymmetry of repurchasing firms changes after repurchase announcements, and how the changes of the information asymmetry of repurchasing firms and their business counterparties affect the wealth of stockholders. This paper employs a sample of 523 repurchase announcements where 189 firms have at least one supplier and 90 firms have at least one customer to examine the information asymmetry effects on abnormal equity returns (AER).

### 4.1 The Variation of Information Asymmetry of Repurchasing Firms

We calculate the change of a repurchasing firm's ADJPIN for different event windows, from three months prior to through three months after a repurchase announcement. The announcement month of a repurchase is time 0.  $F\_ADJPIN(-N, M)$  stands for the change of a repurchasing firm's ADJPIN from  $N$  months before the announcement month to  $M$  months after the announcement month (that is,  $F\_ADJPIN+M$  subtracts  $F\_ADJPIN-N$ ). To examine whether there is a significantly downward trend in ADJPIN of repurchasing firms, Table 6 illustrates the averages of the differences of repurchasing firms' ADJPIN with associated significance tests for nine event windows before and after share repurchase announcements. The results show that repurchasing firms' ADJPIN significantly decreases during the periods of (0,1), (0,2), (0,3), (-2,2), and (-3,3). When the period lasts longer, repurchasing firms' ADJPIN drops more. In sum, these results support Hypothesis 1 that repurchasing firms' ADJPIN significantly declines after share repurchase announcements.

**Table 6. Information asymmetry of repurchasing firms**

This table demonstrates the mean of repurchasing firms' ADJPIN with associated significance tests during different time windows. The announcement month of a repurchase is time 0. F\_ADJPIN (-N, M) stands for the change of a repurchasing firm's ADJPIN from N months before the announcement month to M months after the announcement month (that is, F\_ADJPIN+M subtracts F\_ADJPIN-N). Associated t-statistics are reported right beneath the mean of repurchasing firms' ADJPIN. The signs of \*, \*\*, \*\*\* represent the significance of 10%, 5%, and 1%, respectively.

Time Window	F_ADJPIN	Time Window	F_ADJPIN	Time Window	F_ADJPIN
(-1,0)	0.0009 (1.0739)	(0,1)	-0.0019 (-2.1183)**	(-1,1)	-0.0008 (-0.7356)
(-2,0)	0.0011 (1.2925)	(0,2)	-0.0038 (-3.2893)***	(-2,2)	-0.0025 (-2.1369)**
(-3,0)	0.0001 (0.1009)	(0,3)	-0.0041 (-3.526)***	(-3,3)	-0.0038 (-3.1734)***

## 4.2 The Effect of the Change in Information Asymmetry of Repurchasing Firms on AER

We employ panel data regressions with different event windows controlling for well-known abnormal return determinant variables, industry- and year-fixed effects to examine whether the decrease of repurchasing firms' information asymmetry has an impact on abnormal equity returns (AER), as shown in Eq. (4):

$$AER(-N, M)_k = \alpha + \beta_1 F\_ADJPIN(-Q, R)_k + \beta_2 Pctofrepurchase_k + \beta_3 LnAsset_k + \beta_4 ROA_k + \beta_5 LEV_k + \varepsilon_k \quad (4)$$

where AER (-N, M) denotes the cumulative abnormal equity returns from N days before the announcement date to M days after the announcement date, and F\_ADJPIN (-Q, R) stands for the change of repurchasing firms' ADJPIN from Q months before the announcement month to R months after the announcement month. We conduct the examinations for six different window periods, (-20,20), (-40,40), (-60,60), (0,20), (0,40), and (0,60) for AER, and (-1,1), (-2,2), (-3,3), (0,1), (0,2), and (0,3) for F\_ADJPIN (as 20 transaction days are often viewed as one month). PctofRepurchase is the percentage of shares announced over total outstanding shares. LnAsset is the logarithm of firms' total assets. ROA is the ratio of operating income over total assets. LEV is the leverage ratio, calculated as debt

(in book value) divided by the sum of debt (in book value) and equity (in market value). The book value of debt is “long-term debt” plus “debt in current liabilities,” and the market value of equity is the number of shares outstanding multiplied by share price.

Model (1), Model (4), and Model (7) in Table 7 show the results of Eq. (4) in the time windows of repurchasing firms’ information asymmetry, (-1,1), (-2,2), and (-3,3), and of AER (-20,20), (-40,40) and (-60,60), respectively. While Model (1), Model (4), and Model (7) in Table 8 report the consequences of Eq. (4) in the time windows of repurchasing firms’ information asymmetry, (0,1), (0,2), and (0,3), and of AER (0,20), (0,40) and (0,60), respectively.

Table 7 shows that coefficients of  $F\_ADJPIN(-2,2)$  and  $F\_ADJPIN(-3,3)$  are significantly negative to AER (-40,40) and AER (-60,60), respectively; moreover, the coefficient of  $F\_ADJPIN(0,3)$  in Table 8 is significantly negative to AER (0,60). Therefore, the evidence support Hypothesis 2 that the decline in information asymmetry of repurchasing firms around the repurchase announcements increases abnormal equity returns (AER), which benefits stockholders (information premium effect). In addition, these results show that the change of repurchasing firms’ information asymmetry affects stockholders in long periods, that is, the decrease of repurchasing firms’ information asymmetry after repurchase announcements has a significantly positive impact on abnormal equity returns during three months.

### 4.3 The Effects of Information Asymmetry of Suppliers and Customers on AER

To investigate whether repurchase announcements enhance the relative information advantages of repurchasing firms’ business counterparties, this study uses the following regressions controlling industry- and year-fixed effects to analyze the information impact of business counterparties on abnormal equity returns (AER) with different event windows shown as Eq. (5) and Eq. (6):

$$AER(-N, M)_k = \alpha + \beta_1 F\_ADJPIN(-Q, R)_k + \beta_2 S\_ADJPIN(-Q, R)_k + \beta_3 Pctofrepurchase_k + \beta_4 LnAsset_k + \beta_5 ROA_k + \beta_6 LEV_k + \varepsilon_k \quad (5)$$

**Table 7. The effects of information asymmetry of firms, suppliers, and customers on abnormal equity returns in the event window of (-20, 20), (-40, 40) and (-60, 60)**

This table shows the results of panel regressions with cumulative abnormal equity returns for days -20 to +20, -40 to +40, and -60 to +60 relative to the repurchase announcement date (AER(-20, 20), AER(-40, 40), and AER(-60, 60)) against information asymmetry of firms, suppliers, and customers. ADJPIN is an information asymmetry proxy developed by Duarte & Young (2009) where the repurchase announcement month is time 0 and ADJPIN (-N, M) stands for the change of ADJPIN from N months before the announcement month to M months after the announcement month (that is, ADJPIN+M subtracts ADJPIN-N). F\_ADJPIN, S\_ADJPIN, and C\_ADJPIN stand for ADJPIN of repurchasing firms, suppliers, and customers, respectively. The control variables include repurchasing firms' PctofRepurchase, LnAsset, ROA, and LEV. PctofRepurchase is the percentage of shares announced over total outstanding shares. LnAsset is the logarithm of a firm's total assets. ROA is the ratio of operating income over total assets. LEV is the leverage ratio, calculated as debt (in book value) divided by the sum of debt (in book value) and equity (in market value). The book value of debt is "long-term debt" plus "debt in current liabilities," and the market value of equity is the number of shares outstanding multiplied by share price. This table presents the regression coefficients and adjusted R-squared. The t-statistics for each coefficient appears immediately underneath. The signs of "\*", "\*\*, \*\*\*" represent the significance of 10%, 5%, and 1%, respectively.

Dependent Variable	AER (-20,20)			AER (-40,40)			AER (-60,60)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	-0.1408 (-1.7329)*	-0.0595 (-0.5703)	-0.5720 (-2.6614)**	-0.3106 (-2.7445)***	0.0761 (0.4997)	-0.5568 (-1.4793)	-0.3521 (-2.8098)***	-0.0953 (-0.5025)	-0.8640 (-2.0212)*
F_ADJPIN (-1,1)	-0.3999 (-1.5078)	-0.2768 (-0.5456)	-1.2455 (-2.6266)**						
S_ADJPIN (-1,1)		0.2342 (1.2976)							
C_ADJPIN (-1,1)			1.7093 (0.9551)						
F_ADJPIN (-2,2)				-0.7231 (-2.2334)**	-0.3670 (-0.5473)	-1.1330 (-1.5092)			
S_ADJPIN (-2,2)						-0.6541 (-2.9869)***			
C_ADJPIN (-2,2)						-2.4244 (-1.7081)*			
F_ADJPIN (-3,3)							-1.1778 (-3.1232)***	-0.7740 (-0.8554)	-0.2040 (-0.2034)
S_ADJPIN (-3,3)								-0.4801 (-1.8329)*	
C_ADJPIN (-3,3)									-1.6687 (-0.8484)
PctofRepurchase	-0.0004 (-0.6311)	0.0001 (0.0754)	-0.0013 (-0.5644)	-0.0015 (-1.5823)	-0.0036 (-1.4216)	-0.0077 (-1.9863)*	0.0003 (0.2857)	-0.0035 (-1.1310)	-0.0019 (-0.3944)
LnAsset	0.0086 (1.0443)	0.0033 (0.3718)	0.0568 (2.6006)**	0.0155 (-1.3550)	-0.0086 (-0.6759)	0.0533 (1.3368)	0.0138 (1.1375)	-0.0066 (-0.4136)	0.0701 (1.5800)
ROA	0.4783 (3.7800)***	0.8868 (3.8482)***	0.1480 (0.5431)	1.0012 (5.7412)***	0.6748 (2.0428)**	1.0197 (1.9776)*	0.9921 (5.4056)***	0.2454 (0.5883)	0.5670 (0.8773)
LEV	0.1496 (2.4850)**	0.1233 (1.3787)	0.2574 (1.1766)	0.2401 (2.8810)***	-0.1042 (-0.8088)	-0.1727 (-0.4753)	0.1786 (1.9398)*	-0.1004 (-0.6161)	0.2225 (0.4779)
Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number	511	188	89	504	188	89	490	188	89
Adjusted R <sup>2</sup>	0.0757	0.1752	0.4818	0.1734	0.1990	0.5096	0.1726	0.1548	0.3918

**Table 8. The effects of information asymmetry of firms, suppliers, and customers on abnormal equity returns in the event window of (0, 20), (0, 40) and (0, 60)**

This table shows the results of panel regressions with cumulative abnormal equity returns for days 0 to +20, 0 to +40, and 0 to +60 relative to the repurchase announcement date (AER(0, 20), AER(0, 40), and AER(0, 60)) against information asymmetry of firms, suppliers, and customers. ADJPIN is an information asymmetry proxy developed by Duarte & Young (2009) where the repurchase announcement month is time 0 and ADJPIN (-N, M) stands for the change of ADJPIN from N months before the announcement month to M months after the announcement month (that is, ADJPIN+M subtracts ADJPIN-N). F\_ADJPIN, S\_ADJPIN, and C\_ADJPIN stand for ADJPIN of repurchasing firms, suppliers, and customers, respectively. The control variables include repurchasing firms' PctofRepurchase, LnAsset, ROA, and LEV. PctofRepurchase is the percentage of shares announced over total outstanding shares. LnAsset is the logarithm of a firm's total assets. ROA is the ratio of operating income over total assets. LEV is the leverage ratio, calculated as debt (in book value) divided by the sum of debt (in book value) and equity (in market value). The book value of debt is "long-term debt" plus "debt in current liabilities," and the market value of equity is the number of shares outstanding multiplied by share price. This table presents the regression coefficients and adjusted R-squared. The t-statistics for each coefficient appears immediately underneath. The signs of "\*", "\*\*, \*\*\*" represent the significance of 10%, 5%, and 1%, respectively.

Dependent Variable	AER (0,20)			AER (0,40)			AER (0,60)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	0.1031 (1.6425)	-0.0477 (-0.6429)	0.2478 (1.2826)	-0.0533 (-0.6711)	-0.0268 (-0.2272)	-0.1489 (-0.5452)	-0.1368 (-1.452)	-0.0137 (-0.1035)	-0.1482 (-0.4250)
F_ADJPIN (0,1)	-0.0576 (-0.2286)	-0.3063 (-0.7093)	-0.7404 (-1.4044)						
S_ADJPIN (0,1)		0.0197 (0.1523)							
C_ADJPIN (0,1)			-3.4154 (-1.5939)						
F_ADJPIN (0,2)				-0.2300 (-0.9904)	0.0963 (0.1685)	-0.2840 (-0.5198)			
S_ADJPIN (0,2)						-0.1638 (-1.0133)			
C_ADJPIN (0,2)									
F_ADJPIN (0,3)									
S_ADJPIN (0,3)									
C_ADJPIN (0,3)									
PctofRepurchase	-0.0001 (-0.1858)	0.0000 (-0.0340)	-0.0001 (-0.0477)	-0.0003 (-0.5154)	-0.0029 (-1.4773)	-0.0028 (-0.9242)	0.0009 (1.1801)	-0.0018 (-0.8490)	-0.0002 (-0.0614)
LnAsset	-0.0083 (-1.3034)	0.0049 (0.7806)	-0.0239 (-1.1649)	0.0011 (0.1424)	0.0013 (0.1311)	0.0121 (0.4230)	0.0046 (0.5011)	-0.0035 (-0.3124)	0.0023 (0.0650)
ROA	0.1215 (1.2449)	0.1621 (0.9885)	0.2719 (1.1170)	0.5325 (4.3518)***	0.0669 (0.2590)	0.4035 (1.0433)	0.4968 (3.5635)***	-0.1432 (-0.4835)	0.0836 (0.1618)
LEV	0.0625 (1.3428)	0.0328 (0.5182)	-0.0804 (-0.4059)	0.1281 (2.2014)**	-0.0951 (-0.9443)	0.0810 (0.2912)	0.0728 (1.0475)	-0.1389 (-1.2120)	0.4400 (1.2511)
Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number	514	188	90	509	188	90	496	188	90
Adjusted R <sup>2</sup>	0.0479	0.0600	0.2751	0.0877	0.1041	0.2046	0.1228	0.1769	0.2487

$$AER(-N, M)_k = \alpha + \beta_1 F\_ADJPIN(-Q, R)_k + \beta_2 C\_ADJPIN(-Q, R)_k + \beta_3 Pctofrepurchase_k + \beta_4 LnAsset_k + \beta_5 ROA_k + \beta_6 LEV_k + \varepsilon_k \quad (6)$$

where  $F\_ADJPIN(-Q, R)$ ,  $S\_ADJPIN(-Q, R)$ , and  $C\_ADJPIN(-Q, R)$  represents the changes of ADJPIN of repurchasing firms, suppliers, and customers, respectively, from  $Q$  months before the announcement month to  $R$  months after the announcement month. Tests are conducted during six different window periods,  $(-20,20)$ ,  $(-40,40)$ ,  $(-60,60)$ ,  $(0,20)$ ,  $(0,40)$ , and  $(0,60)$  for AER, and  $(-1,1)$ ,  $(-2,2)$ ,  $(-3,3)$ ,  $(0,1)$ ,  $(0,2)$ , and  $(0,3)$  for  $F\_ADJPIN$ ,  $S\_ADJPIN$ , and  $C\_ADJPIN$ . Other variables are described the same as Eq. (4).

Table 7 and Table 8 provide the regression outcomes of AER against information asymmetry of repurchasing firms, suppliers, and customers in different event windows. The results of Eq. (5) (Eq. (6)) are shown in Model (2), Model (5), and Model (8) (Model (3), Model (6), and Model (9)) in Table 7 in the time windows of suppliers' (customers') information asymmetry,  $(-1,1)$ ,  $(-2,2)$ , and  $(-3,3)$ , and of AER  $(-20,20)$ ,  $(-40,40)$  and  $(-60,60)$ , respectively, and in Table 8 in the time windows of suppliers' (customers') information asymmetry,  $(0,1)$ ,  $(0,2)$ , and  $(0,3)$ , and of AER  $(0,20)$ ,  $(0,40)$  and  $(0,60)$ , respectively.

Significantly negative coefficients of  $S\_ADJPIN(-2,2)$  and  $S\_ADJPIN(-3,3)$  to AER  $(-40,40)$  and AER  $(-60,60)$  in Table 7, and of  $S\_ADJPIN(0,3)$  to AER  $(0,60)$  in Table 8 reveal that information asymmetry of repurchasing firms' suppliers impairs stockholders during the six-month time period when controlling the decline in information asymmetry of repurchasing firms. In addition, we find that the coefficient of  $C\_ADJPIN(-2,2)$  to AER  $(-40,40)$  in Table 7 is significantly negative, which demonstrates that the information asymmetry of repurchasing firms' customers has an adverse effect on stockholders during the four-month time period when controlling the decline in information asymmetry of repurchasing firms. These long-term information effects of suppliers and customers on stockholders of repurchasing firms may be caused by trade credit policies for business counterparties.

When considering information asymmetry of repurchasing firms, suppliers, and customers at once, Model (5), Model (6), and Model (8) in Table 7 and Model

(8) in Table 8 display that the conflict between the information premium effect of repurchasing firms and the relative information advantage effect of suppliers and customers does exist. Furthermore, the coefficients of F\_ADJPIN to AER become insignificant illustrate that the relative information advantage effect of business counterparties dominates the information premium effect, especially on the side of suppliers. These consequences exhibit the importance of the information flow within business counterparties.

Information asymmetry of customers has a less significant effect than that of suppliers on abnormal equity returns, which can be explained by Raghunathan (2001) who shows that suppliers could extract the demand information from the orders of their customers when demands are stationary. In other words, because a repurchasing firm enjoys the information advantage relative to its customers from the information of order flows, information asymmetry of customers has a few effects on its operating decisions and therefore has little significant effect on the value of a repurchasing firm.

Overall, Hypothesis 3 holds since we observe significantly negative information impacts of suppliers and customers on repurchasing firms' abnormal equity returns controlling for repurchase size, firm size, return on assets, and leverage ratio. That is to say, the relative information advantage effect of business counterparties counteracts repurchasing firms' information premium effect owing to repurchase announcements.

## 5. CONCLUSIONS

This study examines the information effects of share repurchases on the wealth of repurchasing firms' stockholders. The results show that information asymmetry of repurchasing firms decreases after repurchase announcements, which benefits their stockholders (information premium effect). However, we also find that the decline in information asymmetry of

repurchasing firms raises the relative information advantages of their business counterparties, and therefore impairs their stockholders (relative information advantage effect), especially those of suppliers. In other words, although repurchase announcements bring repurchasing firms the information premium effect, the relative information advantage effect weakens that effect.

More specifically, information asymmetry of repurchasing firms' suppliers and customers has an adverse effect on stockholders in the longer periods (the four-month and the six-month time period, respectively). These long-term information effects of suppliers and customers on the stockholders of repurchasing firms may be caused by trade credit policies for business counterparties.

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