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Announcement Effects of Open Market Repurchases in China—From Perspective of Enterprise Life Cycle

Tong Xue*, Xiuzhe Tsao

Beijing International Studies University, School of Economics, Beijing 100024, China
Correspondence Author, xuetong@bisu.edu.cn

Abstract: ***This article explores the influencing factors of announcement effects of open market repurchases in China from the perspective of the enterprise life cycle. The findings reveal that the announcement effect of share repurchase is much lower for companies in growth stage than for companies in the maturity and decline stages, confirming the validity of the "free cash flow hypothesis" in the Chinese stock market. Furthermore, the motives of the repurchase and the proportion of shares to be repurchased are crucial elements influencing the announcement effect, which varies depending on the stage of the company's life cycle.***

Keywords: Open market repurchase, Announcement effect, Enterprise life cycle theory**.**

1. Introduction

Since reform of non-tradable shares in 2005, share repurchases have become increasingly familiar and widely used by listed companies in China. In 2018, the revision of China's Company Law and the issuance of Opinions on Supporting Share Repurchase by Listed Companies marked the beginning of a new stage in the development of share repurchase. Companies using the open market repurchase have shown explosive growth.

A large number of existing research have confirmed that announcements of open market repurchases have a significantly positive short-run effect (Vermaelen (1981), Comment and Jarrell (1991), Ikenberry et al. (1995), Grullon and Michaely (2002), Chan et al. (2004), Zhang (2005), Yook et al. (2010)), with an average abnormal return of 3-5 per cent. In studies about China, because of the small sample of open market repurchases before 2018, earlier studies mixed the samples of different repurchase methods. Several studies (He et al. (2014), Dong et al. (2017), Xing (2020), and Chen (2020)), in which only open market share repurchase are included, also obtained a significant positive announcement effect.

At the same time, scholars have also examined what factors affect the size of the market response to repurchase announcements. There are two main factors: the company's specific factors and the characteristics of the repurchase. Companies' specific factors include: company size, the degree of information asymmetry, the degree of financial constraints, the degree of stock price undervaluation, and so on. And the characteristics of the repurchase mainly include the size and proportion of the repurchase, as well as the motive of the repurchase. It is generally believed that the smaller the company size (e.g., Ikenberry et al. (1995), Zhang (2005), Billett et al. (2016)), the higher the degree of information asymmetry (e.g., Billett et al. (2016), Xing (2020)), the lower the degree of financial constraints (e.g., Chen et al. (2012), Yook et al. (2010)), the higher degree of price undervaluation prior to repurchase (Zhang (2005)), the announcement effect of repurchase is higher. The higher the size and proportion of repurchases (e.g., Ikenberry et al. (1995), Yook et al. (2010)), or if the motive of repurchase is to increase stock price (e.g., Ikenberry et al. (1995), Chan (2004)), the higher the announcement effect.

In order to conduct a more in-depth study on the factors that influence the announcement effect of open market repurchase, this paper will examine the company's specific factors from a new perspective—the company's life cycle. Additionally, factors that characterize the repurchase, such as the motive and the proposed proportion will also be included.

2. Theoretical Analysis and Hypothesis Development

In enterprise life cycle theory, a company’s life cycle is divided into the start-up stage, growth stage, maturity stage, and decline stage. Since the listed companies have already passed the start-up stage, we divide the entire sample companies into three stages of life cycles: growth stage, maturity stage, and decline stage.

In various life cycle stages, the growth, profitability, and cash flow conditions of companies clearly differ from one another. Companies in the growth stage are developing at an upward pace, with a smaller size and market share but more investment opportunities and good growth. Companies in the maturity stage are entering a slowdown period, with a more stable performance, higher profitability, and steady growth in operating cash flow. And companies in the decline stage are developing at a downward pace, with a downward trend in market share, sales growth rate, and performance, as well as fewer investment opportunities.

The undervaluation hypothesis and the free cash flow hypothesis are two of the most significant theories that have been proposed in previous research to explain the short-term positive announcement effect of share repurchase.

The undervaluation hypothesis suggests that repurchase announcements are interpreted by the market as a signal from managers that the current share price is undervalued

(Vermaelen (1981), Ikenberry et al. (1995), Stephens et al. (1998), Chan et al. (2004)). The undervaluation hypothesis originates from the information asymmetry theory, which suggests that managers controls the operation of the companies and has a better understanding of the actual operating conditions of the companies, whereas shareholders are unable to effectively supervise the company and are in an informationally disadvantageous position as compared to managers. The undervaluation hypothesis suggests that a company's announcement of share repurchase is a positive signal to the market that the stock price is undervalued, and therefore, the higher the degree of information asymmetry, the greater the announcement effect, which has also been confirmed in previous empirical studies. In different life cycle stages, growth-stage companies tend to have smaller size and market share, and the degree of information asymmetry of the companies is higher (Zhou et al. (2016)). Therefore, if the undervaluation hypothesis holds true, the announcement effect of share repurchases of growth-stage companies should be the highest, relative to maturity-stage and decline-stage companies.

However, there are some studies that do not support the undervaluation hypothesis, with some industry research findings suggesting that the main motives for companies to engage in share repurchases is not to signal that the share price is undervalued, but to reduce excess cash (Baker et al. (2003), Grullon and Michaely (2004), Brav et al. (2005)). Agency theory suggests that when a company's cash flow exceeds its favorable investment opportunities, i.e. it has too much free cash flow, managers tends to make unprofitable investments or distribute excessive benefits, resulting in wastage of funds. According to the free cash flow hypothesis, the company's share repurchase is to release excess cash to shareholders so as to reduce agency costs. Companies that repurchase shares in the open market may face problems such as lack of growth opportunities and low capital utilization, so the return on assets is not high. After the company issues free cash flow through share repurchase, it can not only reduce agency costs, but also effectively improve the efficiency of capital utilization, so as to increase shareholders' wealth.

For maturity- and decline-stage companies, the growth rate of the company's business slows down, and there is a high possibility that the cash flow level is higher than that required for their investment opportunities. The problem of agency costs is prominent. After conducting share repurchases, the company can reduce the free cash flow, effectively reducing overinvestment problems and lowering agency costs, thereby more effectively utilizing assets to improve performance. Its stock price will also receive a positive announcement effect. The situation is exactly the opposite for growth-stage companies. The company is growing its business at a rapid rate and needs a large amount of capital and may face severe financial constraints (Dickinson (2011)). Therefore, there is not much idle free cash flow, and the issue of agency costs is not prominent. Therefore, if the free cash flow hypothesis holds true in China, the announcement effect of repurchases by growth-stage companies should be the lowest compared to maturity- and decline-stage companies.

In summary, the announcement effect of open market repurchase by companies in different stages of life cycle depends on how the market judges the signals sent by their announcements. If the market believes that growth-stage companies have a higher degree of information asymmetry and are therefore more undervalued, then the effect of their announcements will be greater than that of companies in other stage of life cycle. If the market believes that growth-stage companies are already constrained by financial constraints and that share repurchases will have a limited effect on their future operating performance, the announcement effect will be lower than that of other companies.

Based on the above analysis, the following hypotheses are proposed:

H1: There are significant differences in the announcement effects of open market repurchases for companies in different stage of life cycles.

H1a: The announcement effect of repurchases is significantly lower for growth-stage companies than for maturity- and decline-stage companies.

H1b: The announcement effect of repurchases is significantly higher for growth-stage companies than for maturity - and decline-stage companies.

Regarding the division of different stages of life cycle, the existing research literature has proposed different division methods. Cao et al. (2010) assessed each of the three commonly used methods and finally concluded that the cash flow classification method is the most suitable for China. In view of this, this paper also chooses the cash flow classification method to divide the life cycle of companies, as indicated in table 1.

Table 1: Life Cycle Classification Methods

	Growth-stage	Maturity-stage	Decline-stage				
Net cash flow from operating	+	+	-	+	+	-	-
Net cash flows from investments	-	-	-	+	+	+	+
Net cash flow from financing	+	-	-	+	-	+	-

Note: "+" indicates a positive net cash flow and "-" indicates a negative cash flow.

In this paper, the financial data at the end of the previous year of the repurchase announcements, i.e., net cash flow from operations, net cash flow from investments, and net cash flow from financing, are used for the cash flow classification method.

This paper uses the event study method to estimate the cumulative abnormal return (CAR) generated by the announcements of share repurchase. The time period from 180 trading days to 61 trading days before the event date, totaling 120 days, is selected as the estimation window. The Fama-French-three-factor model is chosen to estimate the expected return of the stock. Fama and French explain the excess return of a portfolio (including a single stock) can be explained by its exposure to three factors: market portfolio (Rm−Rf), market value factor (SMB), and book to market ratio factor (HML). The model expression is as follows:

$$R_i - R_f = \alpha_i + \beta_i(R_m - R_f) + S_i E(SMB) + h_i E(HML) + e_i \quad (1)$$

where R_i is the expected rate of return of the portfolio, and R_f is the risk-free rate of return, and R_m is the return of market portfolio.

Excess return is calculated as follows:

$$AR_{it} = R_{it} - E(R_{it}) \quad (2)$$

where R_{it} is the real return of stock i at moment t, which can be derived from the CSMAR database, and $E(R_{it})$ is the expected return of stock i is at moment t.

The value of three factors, i.e. are obtained from the database of China Asset Management Research Centre of the Central University of Finance and Economics. The values of the three factors will be used to estimate each parameter in the three-factor model (β_i, S_i and h_i). Then the corresponding data are substituted to calculate the AR_{it}.

Calculate abnormal return of the various window period as follows.

$$CAR_{it} = \sum_{t=T_1}^{T_2} AR_{it}, t \in [T1, T2] \quad (3)$$

3. Sample Selection

This article selects companies in China's Shanghai and Shenzhen A-shares that have announced repurchases as the samples, with a time range of January 1, 2018 to May 30, 2021. The repurchase information data comes from the CSMAR database. And the following criteria are used to further select the initial sample:

(1) Only samples with open market repurchase as repurchasing method are selected. (2) Samples belonging to the financial sector are excluded. (3) *ST and ST companies are excluded. (4) Samples with trading suspension ten days before and after the announcement date or lack of trading data are excluded. (5) Companies that have experienced significant events such as absorption, merger, and restructuring during the research period are excluded. (6) If the same sample company has made two or more repurchase announcements, the first repurchase announcement is determined to be the research event.

After the screening of the above conditions, a total of 831 sample companies is finally obtained. Among all the samples, growth-stage companies have the highest proportion (49.3% of the total sample), followed by maturity-stage companies (32.1%), and decline-stage companies have the lowest proportion (18.5%).

4. Empirical Results

4.1 Group Testing

Using the event study method, this paper first calculates and tests the announcement effect of repurchases for the whole sample and sub-samples. The results of the mean and median of CAR are shown in Table 2. The results show that the CAR is significantly positive for all the five windows (-1, +1), (-2, +2), (-3, +3), (-5, +5), and (-10, +10), and it is the highest in the window (-1, +1) at 1.91% and decreases with the length of the window, and the lowest in the window (-10, +10) at 0.48%. This shows that the short-term announcement effect of stock repurchases does exist, which is consistent with the findings of the existing literature.

Table 2: Announcement Effect of Share Repurchase in Different Windows

	window period	mean	t-value	median	Z-value
Full sample (N=831)	(-10, +10)	0.0048	1.18	0.0138	2.85***
	(-5, +5)	0.0098	3.02**	0.0139	5.19***
	(-3, +3)	0.0134	5.00***	0.0170	7.72***
	(-2, +2)	0.0152	6.54***	0.0153	8.42***
	(-1, +1)	0.0191	10.04***	0.0180	11.67***
1. Growth-stage companies (N=410)	(-10, +10)	-0.0014	-0.22	0.0037	0.67
	(-5, +5)	0.0002	0.05	0.0056	1.46
	(-3, +3)	0.0069	1.62*	0.0148	3.75***
	(-2, +2)	0.0079	2.20**	0.0085	3.67***
	(-1, +1)	0.0134	4.84***	0.0131	6.20***
2. Maturity-stage companies (N=259)	(-10, +10)	0.0074	1.16	0.0187	1.94**
	(-5, +5)	0.0198	4.15***	0.0216	4.72***
	(-3, +3)	0.0194	5.18***	0.0170	5.69***
	(-2, +2)	0.0210	6.01***	0.0200	6.59***
	(-1, +1)	0.0250	8.30***	0.0224	8.63***
3. Decline-stage companies (N=162)	(-10, +10)	0.0162	1.95**	0.0295	3.08***
	(-5, +5)	0.0179	2.63**	0.0188	3.52***
	(-3, +3)	0.0209	3.32***	0.0240	4.38***
	(-2, +2)	0.0246	4.51***	0.0225	4.90***
	(-1, +1)	0.0242	5.11***	0.0220	5.56***

Note: The t-values and z-values are the results of the two-tailed t-test and the two-tailed Wilcoxon signed rank test, respectively. *, **, *** represent significant at the 10 per cent, 5 per cent and 1 per cent levels, respectively.

We then calculate the differences in CAR between companies in different life cycle. The difference in mean and median are shown in Table 3. From the results, it can be seen that the CAR of each window period of growth-stage companies is lower than that of mature- and decline-stage companies. Compared with maturity-stage companies, the announcement effect of growth-stage companies are significantly lower except for the window period (-10, +10) and the difference is more than 1%, in which the largest difference is in the window period of (-5, +5), the difference of the mean is 1.96%. Similarly, the growth-stage companies' announcement effects are all significantly lower than those of decline-stage companies, with all differences exceeding 1%, and the largest difference is for the (-5, +5) window period, with a mean difference of 1.77%. Meanwhile, there is no significant difference in the announcement effect between maturity- and decline-stage companies.

In summary, the announcement effect of share repurchase of growth-stage companies is significantly lower than that of maturity- and decline- stage companies, while there is no significant difference between the announcement effect of maturity- and decline-stage companies. Hypothesis H1a is verified, which indicates that the market believes that share repurchase of growth-stage companies in the case of possible financial constraints will have limited effect on the enhancement of their future operating performance, and therefore the response to their repurchase announcements is not as positive as that of the other stages of the companies. The free cash flow hypothesis can explain the positive announcement effect of open market repurchases at the current stage in China.

Table 3: Differences in the Announcement Effects of Share Repurchase among Companies at Different Stages of Their Lifecycle

	window period	Mean difference	t-value	median difference	Z-value
Difference between growth-stage and maturity-stage companies	(-10,+10)	-0.0088	-0.98	-0.0150	-1.01
	(-5, +5)	-0.0196	-2.79***	-0.0160	-2.72***
	(-3, +3)	-0.0125	-2.21**	-0.0022	-1.69*
	(-2, +2)	-0.0131	-2.63***	-0.0115	-2.71***
	(-1, +1)	-0.0116	-2.83***	-0.0093	-2.98***
Difference between growth-stage and decline-stage companies	(-10, +10)	-0.0176	-1.68*	-0.0258	-0.06*
	(-5, +5)	-0.0177	-2.07**	-0.0132	-1.84*
	(-3, +3)	-0.014	-1.84*	-0.0092	-1.60
	(-2, +2)	-0.0167	-2.56**	-0.0140	-2.32**
	(-1, +1)	-0.0108	-1.96*	-0.0089	-1.88*
Difference between maturity-stage and decline-stage companies	(-10,+10)	-0.0088	-0.84	-0.0108	-0.85
	(-5, +5)	0.0019	0.23	0.0028	-0.49
	(-3, +3)	-0.0015	-0.20	-0.0070	-0.21
	(-2, +2)	-0.0036	-0.55	-0.0025	-0.13
	(-1, +1)	0.0008	0.15	0.0004	-0.50

Notes: The t-values and z-values are the results of the two-tailed t-test and the two-tailed Wilcoxon signed rank test, respectively. The t-statistic is in parentheses. *** *, * * and * represent significance levels of 1%, 5%, and 10%, respectively.

To ensure the robustness of the results, this paper replaces the estimation model of CAR, using the Fama-French five-factor model to replace the three-factor model. The results are consistent with the that obtained above, which do not appear in this paper due to space limitation.

4.2 Regression Analysis

In order to further validate the impact of firm life cycle on the repurchase announcement effect, and also, to explore the impact of the characteristics of repurchase, this paper uses a multiple regression model to conduct the analysis.

4.2.1 Definition of Variables

(1) Dependent variable: CAR for each different window period of (-1, +1), (-2, +2) and (-3, +3), respectively;

(2) Independent variables:

In this paper, we set two dummy variables about life cycle, Growth and Maturity. If the company is in the growth stage, the Growth variable is 1, otherwise it is 0; if the company is in the maturity stage, the Maturity variable is 1, and otherwise it is 0.

In order to investigate the impact of the motive of repurchase on the announcement effect, this paper sets a dummy variable RM for the motives of repurchase and divides all repurchase samples into two categories: non-equity incentive and equity incentive repurchase. The division method adopted is to manually sort out the wording of the repurchase motives in the repurchase announcements and define the repurchase with explicit reference to equity incentive or employee stock ownership plan as equity incentive repurchase, and define the repurchase event without reference to the above motives as non-equity incentive.

The proposed repurchase ratio RP is the ratio of the number of shares to be repurchased to the total number of shares outstanding in the repurchase announcement.

(3) Control variables

Referring to the existing literature, this paper selects price-to-book ratio (PB), company size (Size), leverage ratio (Lev), return on equity (ROE), and ownership concentration (CRS) as control variables.

The names and definitions of variable are shown in Table 4.

4.2.2 Descriptive Statistics of Variables

The descriptive statistics are shown in Table 5.

Table 5: Descriptive Statistics of Variables

	Mean	Std. Dev.	median	Min	Max
CAR	0.015	0.062	0.015	-0.210	0.189
RM	0.280	0.449	0	0	1
RS	18.00	2.154	18.42	11.73	21.42
Size	22.46	1.235	22.30	20.21	26.34
PB	2.897	2.748	2.187	0.581	21.86
Lev	0.380	0.184	0.371	0.063	0.836
ROE	0.057	0.065	0.050	-0.247	0.254
CRS	0.320	0.126	0.306	0.093	0.660

Table 4: Variables Definition

Variable type	variable name	variable symbol	Variable Definition
Dependent variable	Cumulative abnormal return	CAR	Cumulative abnormal return CAR (-2,2)
Independent variables	Life cycle dummy variable 1	Growth	1 if the company is in the growth stage, 0 otherwise.
	Life cycle dummy variable 2	Maturity	1 if the company is in the maturity stage, 0 otherwise
	Dummy variable for repurchase motives	RM	1 if the motive is equity incentive and 0 otherwise.
	Proposed repurchase ratio	RP	Upper limit of shares to be repurchased/total share outstanding
Control variable	Market-to-book ratio	PB	Ratio of market price per share to net assets per share
	Company size	Size	Natural logarithm of total assets
	Leverage ratio	Lev	Ratio of total liabilities to total assets at the end of the previous year of repurchase announcement
	Return on equity	ROE	Ratio of net profit after tax to total equity at the end of the previous year of purchase announcement
	Ownership concentration	CRS	Percentage of shares held by major shareholders in the month prior to the date of the purchase announcement

4.2.3 Regression Results

As can be seen from Table 6, the coefficients of Growth are all significantly negative, indicating that the CAR of repurchase announcements by growth-stage companies is significantly lower than that of maturity- and decline-stage companies. For example, for the (-2, +2) window period, the CAR of growth-stage companies is on average 1.5% lower, while the coefficient of Maturity is insignificant. The results are consistent with the previous results and Hypothesis H1a is verified.

Meanwhile, the dummy variable for motives of repurchase, RM, is significantly positive (except for the (-3, +3) window period which is only significant at the 14% level), indicating that if one of the motives of a company's share repurchase is to use the repurchased shares for equity incentives, investors will see it as a positive signal to reduce agency costs and enhance company value, which will lead to a higher announcement effect (about 0.8%-0.9% higher). The coefficients of the proposed repurchase ratio RP are all significantly positive, indicating that the higher the ratio of the proposed share repurchase to the total share, the higher the announcement effect. On average, every 1% increase in the proposed repurchase ratio increases the announcement effect by about 0.5%. Investors believe that the higher the proposed repurchase ratio, the more sincere the company is in repurchasing. And at the same time, the more the outstanding shares are reduced, the more the profitability indicators such as earnings per share and return on equity can be improved, and therefore, the higher the announcement effect.

Table 6: Regression Results for Overall Sample

	Dependent variables		
	Car (-1, +1)	Car (-2, +2)	Car (-3, +3)
Growth	-0.008* (-1.67)	-0.015*** (-2.66)	-0.012* (-1.84)
Maturity	0.002 (0.46)	-0.002 (-0.38)	-0.000 (-0.07)
RM	0.009** (2.26)	0.008* (1.74)	0.008 (1.48)
RP	0.514*** (5.66)	0.498*** (4.48)	0.511*** (4.15)
PB	0.001** (1.99)	0.004* (1.70)	0.002 (1.63)
Size	0.002 (1.01)	0.002 (0.89)	0.003 (1.11)
Lev	0.006 (0.46)	0.015 (0.98)	0.016 (0.98)
ROE	0.052* (1.84)	0.039 (1.12)	0.024 (0.62)
CRS	0.016 (1.11)	0.019 (1.11)	0.015 (0.75)
_cons	-0.047 (-1.18)	-0.052 (-1.07)	-0.072 (-1.34)
N	793	793	793
Adj.^{2}	0.0507	0.0377	0.0272
F	5.70***	4.45***	3.46***

Note: * , * * , and * * * indicate significance at the 10%, 5%, and 1% levels, respectively, with t-values in parentheses. Same below.

In order to further verify the influence of repurchase motive and proposed repurchase ratio as well as other factors on the announcement effect, this paper takes the announcement effect in the (-2, +2) window period as dependent variable and the regressions are carried out for samples in different life cycle stages. The results are shown in Table 7.

Table 7: Regression results for samples in different life cycle stages

	Growth-stage	Maturity-stage	Decline-stage
Independent variable	CAR	CAR	CAR
RM	-0.004 (-0.48)	0.017** (2.20)	0.026** (2.18)
RP	0.547*** (3.08)	0.250 (1.41)	0.730*** (2.84)
PB	0.001 (1.17)	-0.001 (-0.47)	0.006* (1.67)
Size	0.006 (1.56)	0.001 (0.16)	0.003 (0.49)
Lev	-0.020 (-0.83)	0.008 (0.32)	0.088** (2.53)
ROE	0.025 (0.42)	0.149** (2.47)	-0.002 (-0.05)
CRS	0.058** (2.15)	-0.041 (-1.41)	0.022 (0.49)
_CONS	-0.144* (-1.88)	0.028 (0.38)	-0.115 (-0.93)
sample size	395	241	157
Adj R-squared	0.031	0.040	0.093
F	2.55**	2.43**	3.28***

The results show that for growth-stage companies, in addition to the coefficient of the proposed repurchase ratio, the coefficient of ownership of concentration (CRS) is also significantly positive, indicating that the higher the proportion of shareholding of the largest shareholder, the higher the announcement effect, which is probably due to the fact that, for growth-stage companies, which are faced with more new issues in their development, the relative concentration of ownership can improve the efficiency of implementation of the decisions, which can help to improve the company's operating performance (Li et al. (2007), Yan et al. (2013), Zhang et al. (2020)). And the coefficient of the repurchase motive dummy variable RM is not significant, i.e., there is no relationship between the announcement effect and the repurchase motive for growth-period companies. The possible reason is that growth-stage companies have good growth, free cash flow tends to be not rich, and there may even be financial constraints, and the agency problem is not prominent, so the market does not care whether growth-stage companies use share repurchases for equity incentives to reduce agency costs, and thus there is no correlation between their announcement effect and whether the motive of repurchase includes equity incentives.

For maturity-stage companies, the coefficients of return on equity (ROE) and the motives of repurchase (RM) are significantly positive, while the coefficient of the proposed repurchase ratio (RP) is insignificant. The possible reason is that the degree of information asymmetry of maturity-stage companies is lower relative to companies in other stages, and the increase in the proposed repurchase ratio does not significantly reduce the degree of information asymmetry for maturity-stage companies. Therefore, the relationship between the announcement effect and the proposed repurchase ratio does not show a significant positive relationship.

For decline-stage companies, the coefficients of repurchase motives (RM), proposed repurchase ratio (RP), price-to-book ratio (PB) and leverage ratio (Lev) are all significantly

positive, indicating that all four factors enhance the announcement effect of share repurchases by decline-stage companies. At the same time, the coefficients of repurchase motives and proposed repurchase ratio are higher than the coefficients in the overall sample as well as samples in other stages, which suggests that, for decline-stage companies, the motive of equity incentives as well as a higher proposed repurchase ratio are more likely to send positive signals to the market, resulting in a higher announcement effect.

5. Conclusions

This paper uses a sample of companies that announced open market repurchases in the A-share market between January 1, 2018, and May 30, 2021. The sample is divided into various stages of life cycles using the cash flow classification method, and the event study method is used to examine the factors that influence the impact of share repurchase announcements. The conclusions are as follows:

(1) The results of the grouping test show that the announcement effect of share repurchases by growth-stage companies is substantially lower than that of maturity- and decline-stage companies, while there is no difference in the announcement effect between maturity- and decline-stage companies. It suggests that the market believes that share repurchase cannot positively affect the future operating performance for growth-stage companies under possible financial constraints, so its announcement effect is low.

(2) The multiple regression results verify that the announcement effect is remarkably low for growth-stage companies. In addition to this, it is found that the motives of repurchase and the proposed repurchase ratio also have an impact on the announcement effect. The announcement effect is higher for samples with the motive of equity incentives. And the higher the proposed repurchase ratio, the higher the announcement effect.

(3) The regression results also show that the factors affecting the announcement effect of repurchase vary across different stages of companies' life cycle. The main findings are that for growth-stage companies, the announcement effect is independent of the motives of repurchase. For maturity-stage companies, the announcement effect is independent of the proposed repurchase ratio. And for decline-stage companies, both the motives of repurchase and the proposed repurchase ratio have a greater effect on the announcement effect.

In view of the above analysis, the following insights are drawn:

(1) When facing the repurchase announcement, the market will analyze and judge the signals sent by the announcement in combination with the different life cycle stages of the company. For maturity- and decline-stage companies, the market believes that share repurchases will reduce excess cash flow and thus agency costs, which in turn will have a higher announcement effect. For growth-stage companies, the market believes that share repurchases in the face of financial constraints will have a limited effect on the improvement of their future operating performance, and thus the announcement effect is lower. Therefore, when a company faces a decline in share price and try to send positive signals to the market using share repurchase to maintain the market value, they should take into account their own situation, especially for companies in the growth-period, and should not make decisions easily. Otherwise they may make their own financial constraints even worse, and at the same time fail to obtain the desired market response.

(2) When the market analyses the repurchase announcements, the motives of repurchase is also an important factor influencing the market's judgement on the repurchase signals. If the motives of repurchase includes equity incentives, it will be considered that it will reduce the agency costs in the future and thus enhance the operation performance, which is more accepted by the market than the repurchase with the motive of only enhancing the market value. Therefore, in the long run, when companies carry out share repurchases, they may focus on considering the use of repurchased shares for equity incentives in order to obtain more desirable consequences.

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