



## ORIGINAL PAPER

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## Signaling hypotheses of share repurchase — life cycle approach. The case of Polish listed companies

**JEL Classification:** G14; G31; G35

**Keywords:** *share repurchase; signaling hypotheses; business life cycle*

### Abstract

**Research background:** Payout policy has attracted a great deal of research, how-ever it still has not been satisfactorily explained why corporations repurchase their shares. The most popular explanation for share repurchases is their signaling power. An alternative explanation for share repurchases is related to free cash flow. We assume that both theories are not competitive, due to the fact that the motives for share repurchases may differ depending on the firm's life cycle stage.

**Purpose of the article:** The aim of the paper is to test the hypotheses that companies in growth stage are more prone to repurchase their shares due to the their undervaluation.

**Methods:** Our analysis focuses on 116 repurchase on WSE and 47 repurchase on NewConnect in Poland during the period 2004–2016 to test the hypothesis. We assume that companies listed on WSE are in their mature stage while listed on NewConnect are in the growth stage. We use market value to book the value ratio (M/BV) and the relation of M/BV ratio for the repurchasing company to the M/BV ratio for the whole market at the date of implementing share repurchase program as a proxies for firm valuation.

**Findings & Value added:** Our study does not confirm that repurchased companies at a growth stage are more undervalued than repurchased companies at a mature stage (at statistically significant level), however there are more repurchased companies at a growth stage with lower M/BV value than repurchase companies in mature stage. Adding corporate life cycle theory into the study, our result can contribute to the literature by more distinctly understanding the motivation of share repurchases. The results might be helpful for companies to determine their financial policies and for investors to determine their investment decisions.

## Introduction

Dividend policy has attracted a great deal of research, however, it is still not satisfactorily explained why corporations distribute dividends, or why firms repurchase their shares. It is common to perceive buybacks as a substitute to dividends, due to the fact that the propensity to pay dividends has diminished and the propensity to conduct buybacks has increased (Dittmar & Dittmar, 2002; Baker & Wurgler, 2004; DeAngelo *et al.*, 2004; Blouin *et al.*, 2011; Grullon & Michaely, 2002). The most popular explanation for share repurchases is their signaling power, which means firms repurchase their shares to signal the belief that the shares are undervalued (Dann, 1981; Vermaelen, 1981; Asquith & Mullins, 1986; Ikenberry *et al.*, 1995; Stephens & Weisbach, 1998). An alternative explanation for share repurchases is related to free cash flow. Free cash flow gives rise to conflicts between shareholders and managers when the latter have incentives to invest in projects beyond those with positive net present value (Jensen, 1986). By returning free cash flow to shareholders, repurchases mitigate these conflicts.

The main idea of agency theory, developed by Jensen and Meckling (1976) is that the agent (manager) and the principal (owner) have different scope of duties, and different interests. Agency theory also suggests that firms with free cash flows in excess of their investment opportunities are likely to spend them on value-destroying projects which reduce the firm's value. Grossman and Hart (1980), Easterbrook (1984), Jensen (1986) argue that if shareholders can minimize the cash management controls, it will be much harder for management to engage in unmonitored spending. One way to take excess cash from the firm is to increase the level of payout (free cash flow hypothesis). In the presence of information asymmetry between investors and managers, Easterbrook (1984) and Jensen (1986) argue that managers are imperfect agents of investors and cash payout can mitigate agency conflicts.

The separation of ownership and management creates asymmetry in the information gained by owners and managers. The managers know more and have better and more thorough knowledge on the company operating activi-

ties. It means that the managers possess private information about the firm, the one not shared with the market. And this asymmetric information has the impact on the investor decisions. Judging by decisions and actions taken by managers, investors can react properly. This situation leads to conclusion that managers' decisions and actions have information content and might convey information (signal) to the investors. The theory of information content and signaling hypothesis was developed by Ross (1977) and Battacharya (1979). But the best known models are those of Bhattacharya (1979), Miller and Rock (1985), and John and Williams (1985). The signaling models suggest that firms adjust cash distribution level to signal their prospects. A rise in dividends or a declaration of a stock repurchase program typically signal that the firm will do better. If the company expects good future and expects to generate cash flow from future activities, it is more likely to distribute cash. The signaling models suggest also that the managers might convey information on their own valuation of the firm (Ofer & Thakor 1987).

Support for the signaling hypothesis of share repurchases was found by: Vermaelen (1981); Ikenberry *et. al.* (1995), Dittmar (2000), Firth *et. al.* (2008), Jagannathan and Stephens (2003), Khaledi and Darayseh (2013). While support for the free cash flow hypothesis was found by: Fenn and Liang (2001), Evans *et.al.* (2001), Yook and Gangopadhyay (2010), Hyderabad (2013), Grullon and Michaely (2002), Lee and Suh (2011), Nohel and Tarhan (1998), Padget and Wang (2007).

Whereas most prior literature favors either the information signaling hypothesis or the free cash flow hypothesis, we assume that both theories are not competitive due to the fact that the motives for share repurchases may differ depending on the firm's life cycle stage.

Corporate life cycle theory has been presented widely in the literature for a long time. Firms in each life cycle stages face different environments, and show different performance. The most common classification for a firm's development includes four stages: start-up, growth, mature and stagnant (Miller & Friesen, 1984; Anthony & Ramesh, 1992; Black, 1998). Most firms at the startup stage are not public-traded, and are financed by venture capital or bank. Firms at the growth stage have more investment opportunities and need more external financing. At the mature stage, growth opportunity is less than in the growth stages, but firms have more excess cash flow. When firms advance into a stagnant stage, they have limited growth opportunities and become less profitable. Some firms may regenerate by investing in new product lines and technology.

The more investment opportunities at the growth stage, the higher possibility of undervaluation firms' value is and the higher information asym-

metry between firms and investors is. Signaling hypothesis emphasizes that repurchasing firms are undervalued and they repurchase their shares to signal to investors that the true value of their corporation's exceeds its current market value. Therefore, firms may have motives to reduce information asymmetry by share repurchases. Based on the life-cycle theory, the process of repurchasing shares to signal undervaluation is the most possible in growth stages.

At the mature stage, firms generally face investment opportunities decrease and cash flow increase. The more excess of cash flow firms have, the higher the conflict between firms and shareholders. Therefore, firms at the mature stage may have motives to reduce agency conflicts and excess of cash flow by implementing share repurchases.

Corporate life cycle theory helps to understand the information content of the share repurchase announcement. Typically, compared with their more mature counterparts, firms at the growth stage have greater investment opportunities, and more serious information asymmetry about the firm's future operating performance than the companies at the mature stage do. We expect that companies at the growth stage would repurchase their shares to signal their good future prospect and current undervaluation.

While firms at the mature stage tend to have greater free cash flow due to lower growth opportunities. We expect that firms at the mature stage may repurchase their shares to prevent spending free cash flows on negative net present value projects.

We examine the undervaluation hypotheses by comparing the value of companies repurchasing their shares at the growth stage, versus the companies repurchasing their shares at the mature stage. This study investigates the reasons driving firms to repurchase their shares during different life cycle stages. We hypothesize that companies at the growth stage are more prone to repurchase their shares due to the undervaluation hypotheses.

Adding corporate life cycle theory into the study, our result can contribute to the literature by more distinctly understanding the motivation of share repurchases. The results might be helpful for companies to determine their financial policies and for investors to determine their investment decisions.

Some authors conducted studies on share repurchases and corporate life cycle, but mostly for the United States (Liang *et.al.*, 2013) and Taiwan (Yu & Jiang, 2010). Our research is conducted for Warsaw Stock Exchange (WSE) — the biggest Central and Eastern European stock market. Since the repurchases have been allowed in Poland since 2004, our analysis covers the period 2004–2016 (there were app. 300 Polish listed companies that announced share repurchase programmes till 2016).

The paper is organized as follows: section 2 describes the data and methodology. Section 3 reports the empirical results. Finally, section 4 concludes the study.

## **Research methodology**

Our analysis focuses on 285 repurchase announcements on main market of WSE and 75 repurchase announcement on alternative market of WSE — NewConnect in Poland during the period 2004–2016 to test the hypothesis. It should be noted that the number of companies that implemented shares repurchases is lower than those that announced share repurchases, because there were companies that announced repurchase without implementing the program. Eventually, our research sample consisted of 116 firms which repurchased their shares out of those listed on main market WSE at the end of 2016 (which is 29.8% companies listed on WSE) and 47 out of those listed on NewConnect at the end of 2016 (which is 11.4% listed on NewConnect). The data used to conduct the research were hand-collected, while reading all current reports from all companies listed on main market of WSE and NewConnect for the period 2004–2016.

A key component in this research is the measure of the life cycle of the firm. Numerous variables have been associated with life cycle stages of firms, including age, firm size (e.g., Anthony & Ramesh 1992; Black 1998). We decided on our original measure of the stage of life cycle as a proxy for the stage of life cycle. In Poland there are two important stock markets: main Warsaw Stock Exchange market (WSE) and alternative trading system of WSE — NewConnect. WSE operates from 1990 and is dedicated to big and mature companies with capitalization higher than 15 million euro and app. 400 companies listed on the WSE. While NewConnect operates from 2007 and is dedicated to innovative, growing companies, with perspective to further intense growth, with another 400 companies listed. We assume that companies listed on WSE are in their mature stage while listed on NewConnect are in the growth stage.

We use market value to book value ratio (M/BV) as a proxy for firm valuation. Not only we use M/BV for a repurchasing company but also the relation of M/BV ratio for the repurchasing company to M/BV ratio for the whole market at the date of implementing share repurchase program. We assume that market value of the company depends strongly on the situation on the whole market. Since we compare the value of M/BV ratio from different years of the 2004–2016 period we have to take into account the market situation. If the M/BV of the repurchasing firm is lower than its life-

cycle counterpart, its motive for repurchases may be to signal its undervaluation; namely, this situation confirms the signaling hypothesis. What is more, if the M/BV of the repurchasing firm is lower than the market M/BV, its motive for repurchase may be to signal its undervaluation. And again, this situation confirms the signaling hypothesis.

In accordance with the previous discussion, we build the following hypotheses:

H1: Companies at the growth stage implement share repurchase less often than companies at the mature stage.

H2: The value (M/BV ratio) of companies repurchasing their shares at the growth stage is lower than the value of companies repurchasing their shares at the mature stage.

H3: The value (M/BV) of companies repurchasing their shares at the growth stage is more frequently lower the value of the value of the market.

## **Research findings**

In the first part of our research we analyze whether the companies at the growth stage (from NewConnect) implement share repurchase less often than those at the mature stage (from WSE) to test the first hypothesis. The data show that 116 companies out of those listed on WSE at the end of 2016 (which is 29.8% companies listed on WSE) and 47 out of those listed on NewConnect at the end of 2016 (which is 11.4% listed on NewConnect) implemented repurchases. It seems that companies at the mature stage implemented repurchases more often and companies at the growth stage less often. To test it, at the very beginning we applied Shapiro-Wilk test of normality.

The null-hypothesis of this test is that the population is normally distributed. Where the p-value for both group of companies — those listed on WSE (mature) and on NewConnect (growth) equals 0.000, we rejected the null hypothesis, which means that there is evidence that the data tested are not from a normally distributed population. In other words, the data are not normal. It means that differences in proportion should be tested with non-parametric test. During the next stage, we applied the U Mann-Whitney test. The null-hypothesis of this test is that the proportion of the repurchase companies is similar for companies at the growth and mature stage. Where-

ever the p-value of U Mann-Whitney equals 0.000, the the null hypothesis is rejected and there is evidence that the data tested (proportion) are not similar. This proves that companies from NewConnect (growing companies) implement fewer repurchases programmes. Table 1 presents the results of testing the frequency of implementing the share repurchase programmes by mature and growth companies.

In the second part of our research we analyze whether the value of the companies in the growth stage (from NewConnect) is lower than the value of companies repurchasing their shares at the mature stage (from WSE) to test the second hypothesis. Table 2 presents the results of testing the differences in value of mature and growth companies implementing share repurchase programmes.

Companies from WSE (at the mature stage) show lower mean and median values of M/BV ratio than NewConnect companies (at the growth stage). But at the same time mature companies have lower variance and standard deviation of M/BV ratio. This might be evidence that companies at the mature stage (listed on WSE) are more undervalued than those in growth stage (listed on NewConnect) which might be contradictory to our hypotheses.

We applied the U Mann-Whitney test to test the significance of the differences in the mean value of M/BV. The null-hypothesis of this test is that the mean value of M/BV for the repurchase companies is similar for companies in growth and mature stage. The p-value of U Mann-Whitney test is 0.240. Because the p-value is higher than the chosen alpha level, then the null hypothesis is not to be rejected and there is evidence that the data tested (mean) are similar. This proves that companies from NewConnect (growth stage) present similar level of M/BV ratio as companies from WSE (mature stage).

In the third part of our research, we analyze the relation of the value of the companies that repurchase their shares in relation to the value of the market to test the third hypothesis. Table 3 presents the results of testing the differences in value of mature and growth companies implementing share repurchase programmes against the market situation.

When comparing the company's M/BV ratio with market M/BV ratio, the mean is lower for WSE (mature) companies repurchasing their shares, but the median is higher for WSE repurchase companies. And what is more important, the median is higher than 1.0. It proves that more than 50% of repurchase companies from WSE have higher M/BV ratio than average for the whole market. This might support the assumption that repurchase companies from NC are undervalued. To verify this assumption, we applied significance tests. We applied the U Mann-Whitney test. The p-value of U

Mann-Whitney test is 0.092. With the alpha level 0.1 the null hypothesis is to be rejected and we can state that there is evidence that the data tested (relation of M/BV of repurchasing company to the M/BV of the whole market) for both WSE and NewConnect companies are not similar. The growth companies have lower value and are more undervalued than mature companies.

What is more, when comparing the M/BV ratios of the repurchasing company to the M/BV of the whole market, we found that for growth companies (NewConnect) there were 55% companies having M/BV lower than M/BV for the whole market. While for the mature companies (WSE) there were only 41% companies having M/BV lower than M/BV for the whole market at the moment of implementing repurchase. This might support hypothesis that companies in growth stage (NewConnect) are undervalued. To test it, we applied the U Mann-Whitney test. The p-value of U Mann-Whitney test is 0.115 and with alpha level of 0.1 the null hypothesis is to be rejected and we can state that there is evidence that the data tested (proportion) are not similar. The growth companies have more often lower value and are more undervalued than mature companies.

## **Conclusions**

The results of our research indicate that companies at the growth stage implemented less often share repurchase programs than mature companies. The data show that 29.8% mature companies implemented share repurchase, while only 11.4% growth companies implemented repurchases.

When controlling for market situation, our study confirms that repurchase companies at the growth stage are more undervalued than repurchase companies at the mature stage (at statistically significant level of 0.1). The market value to book value of growth companies is lower than mature companies.

There are more repurchase companies in growth stage with lower M/BV value than repurchase companies in mature stage. We found that 55% growth repurchasing companies were undervalued, while 41% mature repurchasing companies were undervalued.

We confirm the signaling hypothesis. This is consistent with the results of Yu and Jiang (2010) who found for Taiwan that firms at the growth stage repurchase their share have different motivations, including undervaluation information signaling. At the mature stages, firms not only distribute excess cash flow to stockholders. In the stagnant stage, the reasons for repurchase decisions are not explicit.

Our findings are also consistent with the research of Liang *et. al.*, 2013, who found that in the US a firm at the growth stage tends to announce a repurchase program to signal its undervalued stock whereas firms at the mature stage are prone to buy back shares to dispense excess free cash flow.

Although our research was conducted in the period of strong impact of financial crisis on stock market, the undervaluation was important reason of share repurchases at that time. It is possible that companies tried to time their financial activities (to time the issue of new shares or repurchase them). This behavior might be in line with Dittmar and Dittmar (2007) conclusions who found that stock repurchase waves are driven by the business cycle (GDP and economic activity, relative rate of return).

Another explanation could be related to the fact that owners and managers implement share repurchase because they are convinced (or even overconfident) about the company's undervaluation. Shu *et. al.* (2013) found that the level of managerial overconfidence is positively correlated with the intensity of share repurchase programs. The market in general negatively appraises managerial overconfidence, at least partly attributed to the fact that firms with overconfident managers are less likely to be undervalued.

Last, but not least, it is also possible that share repurchase was the tool to make the investor be convinced about company undervaluation as showed Chan *et. al.* (2007). Consistent with the simple notions of signaling theory, they found evidence that some open market buybacks appear to be announced with the intent of manipulating investors.

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## Annex

**Table 1.** Comparing the proportion of companies repurchasing their shares among mature and growing companies

Test	Results of test	WSE (mature)	NewConnect (growth)
The percentage companies repurchasing their shares		29.8%	11.4%
Shapiro Wilk	Statistics	.571	.368
	p-value	.000	.000
U Mann Whitney	Statistics		65791.5
	Z statistics		-6.314
	p-value		.000

**Table 2.** Comparing the company value between mature and growing companies

M/BV of repurchase companies		WSE (mature)	NewConnect (growth)
Mean		2.1601	3.3126
Median		1.6700	1.8316
Variance		6.108	27.310
Standard deviation		2.47140	5.22592
Min		.19	-.69
Max		23.10	33.37
Kurtosis		45.242	19.324
Skewness		5.668	4.082
Shapiro Wilk	Statistics	.555	.522
	p-value	.000	.000
U Mann Whitney	Statistics		3290.000
	Z statistics		-1.174
	p-value		.240

**Table 3.** Comparing the relation of company value to market value between mature and growing companies

M/BV of companies repurchasing their shares in relation to M/BV of market	WSE (mature)	NewConnect (growth)
Mean	1.7514	1.7624
Median	1.2580	.9310
Variance	7.832	7.128
Standard deviation	2.79864	2.66976
Min	.20	-.42
Max	28.52	14.57
Kurtosis	74.701	13.206
Skewness	7.981	3.517

**Table 3.** Continued

Shapiro Wilk	Statistics	.352	.551
	p-value	.000	.000
U Mann Whitney	Statistics		3120.000
	Z statistics		-1.685
	p-value		.092