

# “Does business cycle matter in bank-firm relationships to overcome under-over-investment?”

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# DOES BUSINESS CYCLE MATTER IN BANK-FIRM RELATIONSHIPS TO OVERCOME UNDER-OVER-INVESTMENT?

## Abstract

Considering that bank does not always perform its functions to overcome financial constraints and to monitor the company's financial activities, this study aims to examine the role of bank-firm relationships in the effect of internal finance on investment based on the business cycle. The testing stages started with testing the effect of internal finance on investment, testing the role of bank-firm relationships in the effect of internal finance to investment, and testing the role of bank-firm relationships based on the business cycles. Non-financial companies listed on the Indonesia Stock Exchange make the sample of this study, while the data used are the financial statements for the period of 2002–2015 sourced from Osiris database. Hypotheses were tested using unbalanced panel regression. The results showed that internal finance has a positive effect on investment. The bank-firm relationships play a significant role in the effect of internal finance on the investment. In the growing companies, bank-firm relationships reduce underinvestment, and in mature companies, bank-firm relationships reduce overinvestment significantly. This study implies that banks run their role in helping to meet the needs of the internal financing. Companies with strong bank-firm relationships reduce the problem of underinvestment and asymmetric information. They also reduce the problem of overinvestment and agency of free cash flow. Banks perform their role in monitoring the financing activities of the mature companies.

## Keywords

bank-firm relationships, internal finance,  
underinvestment, overinvestment, business cycle, agency  
of free cash flow

**JEL Classification** G21, G32

## INTRODUCTION

The bank does not always perform its function of assisting the company, as a financial intermediary, supplying funds for companies that lack funds and control spending for companies that have excess of funds. In some countries, banks have implications only for small and medium enterprises in meeting the needs of supplying funds. Small companies tend to have less information, incentive issues, and limitations to select sources of funding. Ying et al. (2013) found that banks assist more state-owned companies than private ones. Banks are detrimental to private companies, limited companies without government subsidies, or low firms' capital, since banks are not proven to increase their return on asset sales and growth, but their interest payments are positive and significant (Chen et al., 2016). Growing company is significantly dependent on external financial access (Berger & Udell, 1998), while mature companies have very different relationships (La Rocca et al., 2011), as the company prefers the capital market. The relationships of a mature company are more to oversee, control the expenditure so there's no free cash flow. On the other hand, large companies

in Indonesia have better bank loans, use more bank debt, although they have enough funding (Agung, 2010). Therefore, large companies tend to have free cash flows, so this is a potential to overinvestment, while small companies have less cash flows, so this is a potential to underinvestment.

The aim of this study is to examine the role of bank-firm relationships at different stages of the business cycles, reducing underinvestment and overinvestment. Samples of this study include non-financial companies listed on the Indonesia Stock Exchange. The financial statement data for the period of 2002–2015 were sourced from the Osiris Bureau van Dick database. The method used is unbalanced panel regression. The result of this study shows that bank-firm relationships have positive and significant implications for the effect of internal finance on the investment. In growth stage companies, bank-firm relationships play a role in reducing underinvestment, while at a maturity stage, bank-firm relationships play a role in reducing overinvestment.

This paper is structured as follows. It starts with an introduction, followed by the theoretical framework and generated hypotheses. The next section presents the results and discussion of the study. The final section contains the study's conclusion.

## 1. THEORETICAL FRAMEWORK AND HYPOTHESES

The theories underlying this study are the Asymmetric Information Theory and the Agency Theory. The former presents the bank indifference to the company. Banks were not well informed of good or bad prospects of the companies, thus provided the same interest rate for companies applying for credit (A. Tsapin & O. Tsapin, 2014). The companies, which have a good character but do not have sufficient internal funds should pay high costs, so they choose to stop borrowing funds at the bank. This can lead to underinvestment issues. On the other hand, the Agency Theory states that companies with cash surplus have a tendency to do agency of free cash flow. As a result, investment is spent on unprofitable projects, leading to potential overinvestment.

The availability of internal funding makes it easy to invest. For financially constrained companies, cash flows are more sensitive to the investment (Fazzari et al., 1998; Almeida et al., 2004), while strong bank-firm relationships lead to fewer investment insensitivities (Shen & Wang, 2005). This means that the stronger the bank-firm relationships, the more investment needs are easily filled with the availability of limited internal funds by the banks.

*H1: Internal financing has a positive effect on investment.*

*H2: Bank-firm relationships reinforce the effect of internal funding on investment.*

Availability of cash asymmetrically affects large and small companies in different cycles (Hovakimian & Titman, 2006). Growing companies tend to have low cash flow and cash stock, high leverage, low dividends, low profit margins, few financial resources, (Kaplan & Zingales, 1997; Cleary, 1999; Whited & Wu, 2006), and depend on access to external funding (Berger & Udell, 1998). So with strong bank-firm relationships, they can reduce underinvestment. In contrast to mature stage companies, external funding needs are no longer the case (Bulan & Yan, 2010), but bank-firm relationships serve as the control of company activities in preventing agency of free cash flow, thereby reducing overinvestment.

*H3: Bank-firm relationships reinforce the effect of internal funding on investment, reduce underinvestment in growth companies and reduce overinvestment in mature companies.*

## 2. METHODOLOGY

Financial statements data for the period 2002–2015 were sourced from the Osiris Bureau van Dick database. The sample includes 447 non-fi-

nancial companies listed on the Indonesia Stock Exchange. The dependent variable is investment ( $I$ ) as measured by gross investment ratio to long-term debt and shareholders' equity (Shen & Wang, 2005), while independent variable is internal financing (IF) as measured by cash flow (Arslan et al., 2012; Shen & Wang, 2005). Bank-firm relationships, underinvestment, and overinvestment are moderating variables. Bank-firm relationships are measured by the ratio of bank loans to total debt (Cao et al., 2010; Setiawan, 2010). An underinvestment company had low investment and high sales growth (A. Tsapin & O. Tsapin, 2014) and vice versa for an overinvestment company. Control variables include industry sector against heteroscedasticity (Shen & Wang, 2005), size proxied by sales growth and total assets, and age of the company. The stages of growth and mature business cycles in this study divided the sample based on cash flow, namely Operating Cash Flow (CFO), Financing Cash Flow (CFF), and Investing Cash Flow (CFI), following Black (2003), Dickinson (2011), and Sridharan and Joshi (2016)<sup>1</sup>.

Research model on hypothesis 1 is as follows:

$$I_{it} = \beta_0 + \beta_1 IF_{it-1} + \beta_2 Size_{it-1} + \beta_3 Age_{it-1} + u_{it}, \quad (1)$$

where  $I_{it}$  – investment of the company in the year  $t$ ;  $IF_{it-1}$  – internal financing of the company in the year  $(t - 1)$ ;  $Size_{it-1}$  – size of the company in the year  $(t - 1)$ ;  $Age_{it-1}$  – age of the company in the year  $(t - 1)$ .

For  $H1$ , coefficient on internal financing should be positive and significant.

Research model on hypothesis 2 used two models as follows:

$$I_{it} = \beta_0 + \beta_1 IF_{it-1} + \beta_2 BFR_{it-1} + \beta_3 Size_{it-1} + \beta_4 Age_{it-1} + u_{it}, \quad (2.1)$$

where  $I_{it}$  – investment of the company in the year  $t$ ;  $IF_{it-1}$  – internal financing of the company in the year  $(t - 1)$ ;  $BFR_{it-1}$  – bank-firm relationships of the company in the year  $(t - 1)$ ;  $Size_{it-1}$  – size of

the company in the year  $(t - 1)$ ;  $Age_{it-1}$  – age of the company in the year  $(t - 1)$ .

This equation incorporates bank-firm relationships as independent variable to determine whether bank-firm relationships have a positive effect on investment, while the next is to examine the effect of moderation variable of bank-firm relationships on the effect of internal funding on the investment with the model as follows:

$$I_{it} = \beta_0 + \beta_1 IF_{it-1} + \beta_2 BFR_{it-1} + \beta_3 IF_{it-1} \cdot BFR_{it-1} + \beta_4 Size_{it-1} + \beta_5 Age_{it-1} + u_{it}, \quad (2.2)$$

where  $I_{it}$  – investment of the company in the year  $t$ ;  $IF_{it-1}$  – internal financing of the company in the year  $(t - 1)$ ;  $BFR_{it-1}$  – bank-firm relationships of the company in the year  $(t - 1)$ ;  $Size_{it-1}$  – size of the company in the year  $(t - 1)$ ;  $Age_{it-1}$  – age of the company in the year  $(t - 1)$ .

For  $H2$ , coefficient on the moderating variable should be positive and significant.

Research model on  $H3$  is as follows:

$$I_{it} = \beta_0 + \beta_1 IF_{it-1} + \beta_2 BFR_{it-1} + \beta_3 I_{it-1} + \beta_4 Size_{it-1} + \beta_5 UI_{it} + \beta_6 OI_{it} + \beta_7 IF_{it-1} \cdot UI_{it} + \beta_8 IF_{it-1} \cdot OI_{it} + \beta_9 IF_{it-1} \cdot BFR_{it-1} \cdot UI_{it} + \beta_{10} IF_{it-1} \cdot BFR_{it-1} \cdot OI_{it} + u_{it}, \quad (3)$$

where  $I_{it}$  – investment of the company in the year  $t$ ;  $IF_{it-1}$  – internal financing of the company in the year  $(t - 1)$ ;  $BFR_{it-1}$  – bank-firm relationships of the company in the year  $(t - 1)$ ;  $I_{it-1}$  – investment of the company in the year  $(t - 1)$ ;  $Size_{it-1}$  – size of the company in the year  $(t - 1)$ ;  $UI_{it}$  – underinvestment of the company in the year  $t$ ;  $OI_{it}$  – overinvestment of the company in the year  $t$ .

Testing of  $H3$  on the sample of growth company expected that the coefficient of interaction between internal financing, bank-firm relationships, and underinvestment was negatively significant,

1 Operating Cash Flow (CFO), Financing Cash Flow (CFF), and Investing Cash Flow (CFI), following Black (2003), Dickinson (2011), and Sridharan and Joshi (2016), with the following equation:  
 Operating Cash Flow (CFO) =  $NI + Depreciation \& Amortization + \Delta Total Current Liabilities - \Delta Current Debt - \Delta Current Assets + \Delta Cash \& Cash Equivalent$ ,  
 Financing Cash Flow (CFF) =  $Total Long Debt + (Preferred Stock - Carrying Value) + Common Stock + Capital Surplus - Cash Dividend$ ,  
 Cash Flow (CFI) =  $\Delta Cash \& Cash Equivalent - CFF - CFO$ .

while testing on the sample of mature company expected that the coefficient of interaction between internal financing, bank-firm relationships, and underinvestment was positively significant.

Robustness test is performed by different proxies for the same model, i.e. internal financing, bank-firm relationships, and investment variables.

### 3. RESULTS AND DISCUSSION

From the 447 companies, samples were obtained from Indonesia Stock Exchange including 372 companies with bank-firm relationships. Statistic description of the data is shown in Table 1.

Strong bank-firm relationships can be defined by the ratio of bank loans to total debt more than the mean value. Table 1 shows, there is a company with negative investment and internal financing. Standard deviation of the age of the firm is the highest, the oldest company established is as long as 114 years.

*H1* examines the effect of internal financing on investment. Companies need sufficient financing to invest in profitable projects. If internal financing is not sufficient, then the company must meet its

financing needs through external financing, but costs are high due to the information and agency costs. *H1* test results as follows (see Table 2).

Investment is measured by the ratio of the gross investment to long-term debt and shareholders' equity (*I*). Internal financing is measured by the previous year's cash flow, which is the ratio of earning after taxes plus depreciation to total assets (*IF*). Company size (*Size*) uses total assets calculated as natural logarithm in the previous year. Age of the company (*Age*) of the previous year is measured by the difference in the year of establishment of the company by 2015. From Table 2, internal funding has a significant positive effect on investment ( $p = 0.003$ ), that is the adequacy of cash flow encourages companies to invest in profitable projects.

When a company does not have sufficient internal financing, the company is faced with the choice of external financing through debt or capital markets. Pecking Order Theory says that when internal financing is insufficient, the external funding alternatives (i.e. debt) are to be utilized. *H2* examines the role of bank-firm relationships for the effect of internal funding on investment. Bank debt is expected to strengthen the company financing position. Companies with strong financing struc-

**Table 1.** Statistic description

Variable	N	Obs.	Mean	Median	Minimum	Maximum	SD
Bank-firm relationships ( <i>BFR</i> )	374	3,953	0.2669	0.1379	0	1	0.3051
Investment ( <i>I</i> )	374	3,949	0.1432	0.0969	-5.6924	4.5046	0.5004
Internal financing ( <i>IF</i> )	374	3,951	-0.0098	0.0046	-5.5718	2.2385	0.1859
<i>Size</i>	374	3,951	20.9584	21.0462	13.7113	26.2263	1.7794
Age of the firm ( <i>Age</i> )	374	3,953	28.4380	25	0	114	19.159
Underinvestment ( <i>UI</i> )	374	5,236	0.1283	0	0	1	0.3345
Overinvestment ( <i>OI</i> )	374	5,236	0.1253	0	0	1	0.3311

**Table 2.** The effect of internal financing on the investment

Dependent variable	Investment ( <i>I</i> )		
	Coefficient	T-test	P-value
Constant	1.4232***	6.05	0.000
Internal financing ( <i>IF</i> <sub><i>t-1</i></sub> )	0.1671***	3.02	0.003
<i>Size</i> <sub><i>t-1</i></sub>	-0.0719***	-5.55	0.000
<i>Age</i> <sub><i>t-1</i></sub>	0.0059**	2.19	0.028
Observation	3,572		
N	372		
Adj-R <sup>2</sup>	0.01%		

Note: \* significant at 0.10; \*\* significant at 0.05; \*\*\* significant at 0.01.

**Table 3.** Role of bank-firm relationships for the effect of internal financing on the investment

Independent variables	Investment ( <i>I</i> )					
	Model 2.1			Model 2.2		
	Coefficient	t-test	p-value	Coefficient	t-test	p-value
Constant	1.2653***	4.94	0.000	1.2740***	4.98	0.000
Internal financing ( $IF_{t-1}$ )	0.1758***	3.22	0.001	0.1013*	1.72	0.086
Bank-firm relationships ( $BFR_{t-1}$ )	0.0170	0.88	0.379	0.0209	1.08	0.282
$(IF_{t-1}) * (BFR_{t-1})$	—	—	—	0.4131***	3.32	0.001
Size <sub><i>t-1</i></sub>	−0.0629***	−4.47	0.000	−0.0631***	−4.49	0.000
Age <sub><i>t-1</i></sub>	0.0045	1.64	0.102	0.0043	1.57	0.116
Observation	3,375			3,375		
N	372			372		
Adj-R <sup>2</sup>	0.01%			0.08%		

Note: \* significant at 0.10; \*\* significant at 0.05; \*\*\* significant at 0.01.

tures invest better. On the other hand, the bank performs its function to meet the financing needs of the company. Summary of Hypotheses 1 and 2 test results are presented in Table 3.

Table 3 shows investment measured by the ratio of gross investment to long-term debt and shareholders' equity (*I*). Internal financing is measured by the previous year's cash flow, which is the ratio of earning after taxes plus depreciation to total assets (*IF*). Bank-firm relationships (*BFR*) is measured by the ratio of bank loans to total debt. Company size (*Size*) uses total assets calculated as natural logarithm in the previous year. The age of the company (*Age*) of the previous year is measured by the difference in the year of establishment of the company by 2015. Model 2.1 shows the effect of internal financing to the investment is positively significant ( $p = 0.001$ ) and bank-firm relationships have a positive effect on investment ( $p = 0.379$ ). This means that bank-firm relationships help the availability of company financing to invest. Model 2.2 shows that bank-firm relationships reinforce the significant effect of internal funding on investment ( $p = 0.001$ ). This implies that the existence of a bank as a financial intermediary helps the company to ensure the availability of financing so as to invest in profitable projects. Companies that have strong relationships with banks do not need to have too much cash flow, because the financing needs for investment has been met by banks, but a positive relationship between debt and investment ratios needs to be monitored due to low bank supervision system (Cao et al., 2010).

*H3* examines the role of bank-firm relationships for the effect of internal financing on investment.

The results of Hypothesis 3 testing are differentiated by group of companies in growth stage and mature as in Table 4.

Table 4 shows that the sample includes non-financial firms with strong bank-firm relationships and at the growth stage. Investment is measured by the ratio of gross investment to long-term debt and shareholders' equity (*I*). Internal financing is measured by the previous year's cash flow, which is the ratio of earning after taxes plus depreciation to total assets (*IF*). Bank-firm Relationships (*BFR*) is measured by the ratio of bank loans to total debt. Underinvestment (*UI*) is if the company has less than average investment and has sales growth more than average. Overinvestment (*OI*) is if the company has more than average investment and has less than average sales growth. Company size (*Size*) uses total assets calculated as natural logarithm in the previous year. The age of the company (*Age*) of the previous year is measured by the difference in the year of establishment of the company by 2015. It can be seen from the Table 4 that banks reduce underinvestment of the companies at the growth stage and have strong bank-firm relationships ( $p = 0.035$ ). In the growing company, the bank strengthens internal financing so as to make profitable investments and reduce underinvestment. This supports the results of research by Cao et al. (2010) which found that firms at the growth stage have a higher risk than companies that are not at the growth stage. The company requires higher capital expenditure and research and development costs for long-term investments. Relationships with fewer banks and generating a relatively larger supply of funds can help compa-



**Table 4.** The role of bank-firm relationships in overcoming underinvestment and overinvestment

Dependent variable	Investment ( <i>I</i> )					
	Growth			Mature		
	Coefficient	t-test	p-value	Coefficient	t-test	p-value
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	3.0739	1.35	0.189	2.1313	1.16	0.250
Internal financing ( $IF_{t-1}$ )	0.9738***	2.82	0.010	0.5893*	1.69	0.094
Bank-firm relationships ( $BFR_{t-1}$ )	0.1619	0.99	0.332	0.0548	0.60	0.547
Investment ( $I_{t-1}$ )	-0.0154	-0.17	0.869	-0.1319**	-2.46	0.015
UI	-0.3413*	-1.84	0.078	-0.1065	-1.35	0.181
OI	0.4058***	3.88	0.001	0.4462***	8.92	0.000
$(IF_{t-1}) \cdot UI$	10.6641***	5.50	0.000	3.3288***	3.31	0.001
$(IF_{t-1}) \cdot OI$	0.4964	0.43	0.675	-2.1940***	-4.02	0.000
$(IF_{t-1}) \cdot (BFR_{t-1}) \cdot UI$	-9.0410**	-2.24	0.035	-8.9173***	-3.43	0.001
$(IF_{t-1}) \cdot (BFR_{t-1}) \cdot OI$	-1.7041	-0.87	0.392	2.4831**	2.23	0.028
Size <sub><i>t-1</i></sub>	-0.1412	-1.44	0.164	-0.1054	-1.20	0.234
Observation		88			257	
N		55			142	
Adj-R <sup>2</sup>		11.42%			21.19%	

Note: \* significant at 0.10; \*\* significant at 0.05; \*\*\* significant at 0.01.

nies reduce risk. Test results of this hypothesis also support the research by A. Tsapin and O. Tsapin (2014) who found that the bank helps its clients in reducing underinvestment problems caused by asymmetric information. This is in line with the research findings of Hovakimian (2009) stating that companies that conduct underinvestment are those that have low cash flows, so companies tend to utilize bank loans to finance working capital. Banks can also reduce corporate overinvestment at the mature stage ( $p = 0.028$ ). Overinvestment is synonymous with the existence of free cash flow that is utilized to maintain existing assets in the company and financing excessive new investment so as not to provide benefits for the company. Banks play a role in keeping investment spending so as not to be above optimal.

These results support research by Richardson (2006), Franzoni (2007), and A. Tsapin and O. Tsapin (2014) indicating that the existence of free

cash flow characterized by positive cash flow allows the agency cost caused by potential managers to spend the excess of cash. Franzoni (2007) says that companies that are predicted to overinvest are old, large, and have a guarantee by the ranking agency, and have excessive operating cash flow, but have low financial performance and negative investment profits.

Robustness test of this study using bank-firm relationships proxies, ie. dummy bank loans, number of banks, and credit days showed the same results by splitting sample of growth companies based on the category of strong bank-firm relationships, while the mature company proxied by the ratio of bank loans to total debt dummy.

Limitations of this study are in the fact that the quality of the bank, credit rating, and sample criteria based on industry sector have not been considered.

## CONCLUSION

Having examined the role of bank-firm relationships to overcome underinvestment and overinvestment of the companies at different stages of the business cycles, this study's results show that banks play a

significant role in strengthening the effect of internal funding on investment. It was shown that internal funding had a significant positive effect on investment so the adequacy of cash flow encouraged companies to invest in profitable projects. Bank-firm relationships reinforce the significant effect of internal funding on investment. This implies that the existence of a bank as a financial intermediary helps the company to ensure the availability of financing so as to invest in profitable projects. In the growth companies, banks play a significant role to help meet the financing needs of the company so as to reduce underinvestment. In these conditions, banks reduce asymmetric information caused by the inequality of information owned by companies and banks so that companies have to spend high costs to get credit. In mature companies, banks play a role to monitor the activities of the company so as to reduce the overinvestment and agency of free cash flow caused by the excess cash that can be used for spending on activities which are not profitable.

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