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Does The Market Matter for More Than Investment?

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DOES THE MARKET MATTER FOR MORE THAN

INVESTMENT?

A REPLICATED CONFIRMATION

By

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Abstract

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Does the market matter for more than investment? by Jason Smith examines how the multiple effects of the market (through stock prices) can affect a corporation. The main findings are that low stock prices precede lower costs and lower investments. The main innovation of this work is showing that the market can matter for more than a simple investment. Low stock prices imply that the market may disagree with investment and lead the manager to reduce costs. This result does not appear to be driven by financial constraints.

1   Introduction

The market economy is a competitive economy. Under the conditions of economic globalization, the competition between enterprises not only in the country, but also in the world. If the company wishes to win the competition, the corporate decision made by the manager must take the market demand and supply as its core. At the same time, this makes reducing production costs and improving production efficiency a goal. However, how can they achieve this goal? Polk and Sapienza (2008) considered whether mispricing in the stock market affects the company investment policy. Then they test Catering Theory and show that the corporate investment decisions of enterprises are greatly influenced by the market value of the company. So the consistency of market and investment is very significant. This paper has two objectives. One is that the market can matter for more than a corporate investment; the other is that the disagreement between the market and the manager can affect companies and makes them reduce production costs and improve production efficiency.

Why can the market affect corporate investment? The manager can get investment opportunities from the capital market if they have comprehensive and correct information. In contrast, if the manager gets wrong and incomplete information, what will happen? The disagreement between market and manager would cause stock mispricing. According to a CNN report, people pay a lot of money to the investment manager in order to get more benefits, but 86% of investment managers failed in 2014. Nearly 89% of those fund managers underperformed their benchmarks over the past five years; 82% did the same over the last decade. Why does this happen? Because the market disagrees with the corporate investment, the market and the manager will have asymmetric information.

Why does the manager get incorrect and incomplete information? One essential reason is financial constraints. Due to financial constraints, the manager will only focus on the information about the market, and the other parts of the information are ignored. If there are

no financial constraints, the manager will be concerned about the changes in the market and make the most correct investment choices. In some instances, the manager must choose between reducing production costs and increasing investment due to financial constraints. If the market agrees with corporate investment, the manager will increase investment and create the new product. If the market disagrees with corporate investment, the manager will decrease investment and improve cost efficiency.

How to identify an agreement? The first measure of an agreement is dispersion in analysts' earnings forecasts. The second measure and the third measure are according to Chen, Hong, and Stein (2001). The second measure is to take the number of funds that hold the stock at t minus the number of funds that hold the stock at t-1 and divide by the total number of funds in the sample at t-1. This measure is useful for forecasting returns. The third measure is the change in aggregate mutual fund stockholdings from the end of t-1 to the end of t.

The remainder of the paper is organized as follows. In Section 2, I discuss some of the relevant literature and empirical predictions. I describe the data in Section 3 and report the results in Section 4. I make a discussion about robustness in Section 5, and in Section 6 summarizes my results.

2   Related literature and Predictions

Getting information from the market is a very important step before the manager makes a corporate investment decision. Zuo (2013) examines whether managers use information contained in stock prices when making forward-looking disclosures. He found when more deals are being informed, the association between forecast revisions and changes in stock prices are the most powerful during the period of revision. Then he discovered that if more investor information were reflected in stock prices, it would be better to promote the improvement of prediction accuracy. Bank and Lawrenzz (2005) considered the influence of

asymmetric information between managers and investors on the optimal capital structure decision. They concluded that the manager will try to avoid debt, and their optimal bankruptcy threshold is lower than the threshold set by equity holders. Boujelbenel and Besbes's (2012) study of 124 firms from 1999 to 2008 reach the conclusion that the average daily trading volume has a positive effect on the asymmetric information between managers and investors, and the stock price has a negative effect on the asymmetric information between managers and investors.

A lot of literature explained the effect on the disagreement between the market and corporate investment. Thakor and Whited (2006) shows, "we found first that a high stock price and a low level of disagreement act together to increase investment today relative to invest tomorrow." In their model, the disagreement and firm value is inversely related. Compared to asymmetric information or managerial entrenchment, disagreement can drive corporate investment. Baker, Hollifield, and Osambela (2016) argue that disagreement can increase stock return volatility, and lead to a countercyclical price of risk and procyclical investment growth.

Bakke and Whited (2010) use an econometric errors-in-variables remedy to test that stock market mispricing does not affect corporate investment. However, most literature disagrees with this viewpoint. Farhi and Panageas (2004) considered the effect that stock market mispricing has two aspects. One aspect is that it will make the manager make wrong investment decision and cause production inefficiencies. The other aspect is that it will make the problem of insufficient funds to be eased, so that some projects will be effectively carried out.

Khanal, Koirala, Regmi (2016) provides an improved understanding of the role of financial and economic factors in rice production efficiency. Then we use a parametric stochastic frontier model and a non-parametric DEA (data envelopment analysis) approach to

find that financial constraint has a negative impact on efficiency, while a combined effect of education and off-farm work have a positive impact on efficiency. Chan (2008) considers that the financial constraints do not limit the company's output reaction to negative shocks, but it restricts the positive shocks. She draws the conclusion that financial constraints can be used to prevent the company from using production opportunities to make a profit.

I conclude some testable implications from these discussions. First, the disagreement will cause lower corporate investment and lower production cost. Second, asymmetric information will lead to stock market mispricing and stock market mispricing is associated with financial constraint. Robustness tests support the results for the least financially constrained firms.

3   Data

Sample data of all firms are from the Center for Research in Security Prices (CRSP) and COMPUSTAT Industrial Annual Database from January 1970 through December 2003. I obtained the analysts' forecast data from I/B/E/S Database for all firms from January 1980 through December 2003. The full sample includes 127,582 observations. The Center for Research in Security Prices (CRSP) includes daily stock prices for all firms from January 1980 to December 2003. Thompson Financial Network (TFN) includes quarterly mutual funds data for all mutual funds from January 1980 to December 2003.

Cash flow can be calculated by subtracting the change in working capital (Compustat data cwkcap) from operating income before depreciation (Compustat data oibd). Costs can be calculated by adding selling, general, administrative expenses (Compustat data sgaex) and the cost of goods sold (Compustat data cgs). Investment is defined as capital expenditures (Compustat data capex). I calculated net equity issuance by subtracting the change in retained earnings over lagged book assets (Compustat data cretearn) from the change in book equity

(Compustat data cbequity). Debt issuance can be calculated by long-term debt reduction (Compustat data debt_reduction) from long-term debt issuance (Compustat data debt_issue) less. Appendix A includes the rest of variables descriptions. We report summary statistics for the variables in Table 1.

[Insert Table 1]

3.1   Agreement Measures

In this paper, how to measure the agreement between the management and investors is most important. I provide three proxies to calculate the amount of agreements between the management and investors. The first proxy for agreement is dispersion in analysts' earnings forecasts, denoted SDAF. Forecast dispersion is widely used to proxy for the measure of agreement. I measured forecast dispersion as the standard deviation of analyst forecast earnings usually based on the absolute value of the mean earnings forecast.

The second proxy is the breadth of mutual fund holdings, denoted $Breadth_t$, according to the Chen, Hong, and Stein (2002), as defined by the ratio of the number of mutual funds holding a long position in the stock in quarter t to the total number of mutual funds in quarter t. $\Delta Breadth_t$ is defined as the number of mutual funds at quarter t minus the number of mutual funds at quarter t-1 divided by the total number of mutual funds at quarter t-1.

The third proxy is the total mutual fund holdings, denoted $Held_t$, and is defined as the total number of mutual fund holdings at the end of quarter t divided by the total number of shares outstanding. $\Delta Held_t$ is defined as the change in mutual fund holdings from the end of quarter t-1 to the end of quarter t.

In table 2, I show the correlation between $SDAF_{t-1}$, $\Delta Breadth_t$, and $\Delta Held_t$. The correlation coefficient between the $SDAF_{t-1}$ and $\Delta Breadth_t$ is near 8%, the correlation

coefficient between SDAF$_{t-1}$ and ΔHeld$_t$ is less than 1%, and the correlation coefficient between ΔBreadth$_t$ and ΔHeld$_t$ is greater than 10%.

3.2   Financial Constraints

Controlling for debt issuance, equity issuance, and financial constraints can make markets agree with the corporate investment decision, even if the firm is short of funding. Debt issuance and equity issuance have been explained above. How to control financial constraints? There are many ways to control the financial constraints, and now we focus on one of them. Payout Ratio.

The payout ratio is calculated as dividends per share over earnings per share. According to Fazzari, Hubbard, and Petersen (1988), payout ratio can be used as a proxy for financial constraints. If the firm is short of external funding, the firm will choose not to pay dividends or pay fewer dividends, leading to a lower payout ratio, which will be more likely to have financial constraints. However, from the perspective of long-term growth in the future, even the firm has a positive profit. The firm will also choose not to pay dividends or pay fewer dividends to increase the internal funds. Finally, the firm has a lower payout ratio and more financial constraints.

4   Empirical Results

4.1   Production Efficiency

This cost regression is used to measure of each agreement:

$$\frac{C_{i,t}}{A_{i,t-1}} = f_i + \gamma_t + \beta_1(Agreement) + \beta_2\left(\frac{S_{i,t}}{A_{i,t-1}}\right) + \beta_3(Size) + \beta_4(A.S.G.) + \epsilon_{i,t}$$

From Table 3, I use cost and alternative cost to analyze three agreement measures.

[Insert Table 3]

The coefficient of the dispersion in analysts' earnings forecast is -0.058. Dispersion in analysts' earnings forecasts is the inverse of agreement, so the increase of dispersion will cause the decrease in agreement. If dispersion increases one standard deviation, the costs will decrease 1.91%. The coefficient of the change in the breadth of mutual fund holding is 2.04. If the breadth of mutual fund holdings increases one standard deviation, the costs will increase 1.632%. The change in percent of total mutual fund holding has positive coefficient is 0.299. If the change in percent of total mutual fund holding increase one standard deviation, the costs will increase of 1.465%. The result of the alternative costs measure is close to the costs measure. All of the variables are significant at the one percent level.

4.2   Financial Constraints

If the firm has financial constraints, the firm will have some limits in the market. But when the firm does not have financial constraints, the firm is free to make a decision. In order to prove this point, I created a financial constraint group and a financial unconstraint group to run the test for firms. If the result for unconstrained firms does not change, it provides evidence to prove that the market is not the only factor that affects the corporation. Table 4 presents the results using payout ratio to measure financial constraint.

[Insert Table 4]

From Table 4, it gives evidence that the firm has more financial constraints; the economic impact of the agreement will be greater. Even for a financially unconstrained firm, the agreement between the market and corporate investment also influence the firm's cost structure. Most of the variables are significant at the one percent level.

5   Robustness

If the market has more investment opportunity, the firm will choose the investment. However, when the market has less investment opportunity, the manager has to choose to cut the production costs. Through a robustness check for the investment opportunity, a dummy variable consists of each four-digit industry code. The result does not include the firm's fixed effects because many firms' primary industry does not change in the sample. All results are unaffected.

6   Conclusion

The main topic of this paper is to discuss the disagreement and agreement between the market and corporate investment. This paper has sufficient evidence to prove that disagreement between the market and corporate investment can let companies reduce production costs and improve production efficiency. If the market agrees with the corporate investment, the manager will take time to consider investment while not considering costs.

If the firm is lacks of external funding, the manager will also choose costs reduction. Controlling for debt issuance, equity issuance, and financial constraints can make the market agree with the corporate investment decision, even if the firm is short of funding. One thing that is worth mentioning is that using the payout ratio to measure financial constraints.

References

Baker, D. S., Hollifield, B., & Osambela, E. (2016). Disagreement, speculation, and aggregate investment. *Journal of Financial Economics,* 119, 210-225.

Baker, M. (2009). Capital market-driven corporate finance. *Annual Review of Financial Economics,* 1, 181-205.

Bakke, T. E., & Whited, M. T. (2010). Which firms follow the market? An analysis of corporate investment decisions. *Review of Financial Studies,* 23(5), 1941-1980.

Bank, M., & Lawrenzz, J. (2005). Informational asymmetry between managers and investors in the optimal capital structure decision. *EFA 2005 Moscow Meetings Paper*.

Boujelbene, Y., & Besbes, L. (2012). *The determinants of information asymmetry between managers and investors: a study on panel data.* King of Prussia, PA: IBIMA publishing.

Chan, R. C. (2008). *Financial constraints, working capital and the dynamic behavior of the firm* [PDF document]. Retrieve from https://mpra.ub.uni-muenchen.de/27153/1/MPRA_paper_27153.pdf

Chen, J., Hong, H., & Stein, C. J. (2002). Breadth of ownership and stock returns. *Journal of Financial Economics,* 66, 171-205.

Egan, M. (2015, March 12). 86% of investment managers stunk in 2014. *The Cable News Network.* Retrieved from http://money.cnn.com/2015/03/12/investing/investing-active-versus-passive-funds/

Farhi, E., & Panageas, S. (2004). The real effects of stock market mispricing at the aggregate: Theory and Empirical Evidence. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=720462

Fazzari, S. M., Hubbard, R. G., & Petersen, B. C. (1988). Financing Constraints and Corporate Investment. *Brookings Papers on Economic Activity,* 1988(1), 141-206.

Information Resources Management Association. (2014). *Banking, finance, and accounting: concepts, methodologies, tools, and applications.* Hershey, PA: Business Science Reference.

Khanal, R. A, Koirala, K., & Regmi, M. (2016). Do financial constraints affect production efficiency in drought prone areas? *the Southern Agricultural Economics Association's 2016 Annual Meeting.*

Polk, C., & Sapienza, P. (2009). The stock market and corporate investment: a test of catering theory. *Oxford Journals,* 22, 187-214.

Thakor, V. A, Whited, M. T. (2006). Shareholder-manager disagreement, animal spirits, and corporate investment. *Review of Finance,* 15, 277-300.

Zuo, L. (2013). *The informational feedback effect of stock prices on corporate disclosure* (Doctoral dissertation). Massachusetts Institute of Technology, MA.

Table 1
Summary Statistics
The table reports the means, medians, standard deviations, minimums, and maximums for all variables in the sample. Note that all variables reported here are taken from the largest sample available. Appendix A is variable definitions.

Variables	Mean	Median	St. Dev.	Min	Max
$SDAF_{t-1}$	0.136	0.038	0 .331	0.000	2.418
$\Delta Breadth_{t-1}$	0. .001	0.000	0. .008	-0.024	0 .033
$\Delta Held_{t-1}$	0 .007	0.003	0 .049	-0.140	0.0166
$Size_t$	5.034	4.714	1.844	2.302	13.381
C_t	1.323	1.144	0 .950	0 .077	5.472
Alt. C_t	1.269	1.083	0 .947	0 .077	5.337
$Sales_t$	1.169	1.100	0 .421	0 .398	3.672
NEI_t	0 .057	0.002	0 .198	-0.149	1.338
NDI_t	0.025	0.000	0 .125	-0.247	0.702
A.S.G.	0 .149	0.105	0 .243	-0.566	2.598

	$SDAF_{t-1}$	$\Delta Breadth_t$	$\Delta Held_t$
Table 2			
Correlation Matrix			
The table presents the correlation between the three measures of agreement.			
$SDAF_{t-1}$	1.000		
$\Delta Breadth_t$	-0.078	1.000	
$\Delta Held_t$	0.000	0.161	1.000

Table 3
Estimation Results : Costs
The table reports the results from regressing the four measures of agreement on costs and alternate costs. P-values are report in parenthesis

Variables	Cost			Alternative Costs		
	I	II	III	IV	V	VI
$SDAF_{t-1}$	-0.058*** (0.000)			-0.054*** (0.000)		
$\Delta Breadth_{t-1}$		2.040*** (0.000)			1.832*** (0.000)	
$\Delta Held_{t-1}$			0.299*** (0.000)			0.256*** (0.000)
A.S.G.	0.173*** (0.000)	0.226*** (0.000)	0.197*** (0.000)	0.169*** (0.000)	0.217*** (0.000)	0.190*** (0.000)
$Size_t$	-0.141*** (0.000)	-0.136*** (0.000)	-0.134*** (0.000)	-0.131*** (0.000)	-0.126*** (0.000)	-0.124*** (0.000)
$Sales_t$	0.402*** (0.000)	0.367*** (0.000)	0.197*** (0.000)	0.374*** (0.000)	0.335*** (0.000)	0.341*** (0.000)
Intercept	1.613*** (0.000)	1.572*** (0.000)	1.546*** (0.000)	1.525*** (0.000)	1.493*** (0.000)	1.468*** (0.000)
N	32451	36077	38598	32451	36077	38598
Adj. R-squared	0.274	0.221	0.217	0.2645	0.214	0.210

Significance levels :   *** : 1%   ** : 5%   * : 10%

Table 4
Estimation Results : Financial Constraint – Cost
The table reports the costs regression results for both financially constrained and financially unconstrained firms determined by the payout ratio. P-value are report in parenthesis.

Financial	Payout		Ratio			
Criteria	(C)	(U)	(C)	(U)	(C)	(U)
$SDAF_{t-1}$	-0.032**	-0.050***				
	(0.016)	(0.000)				
$\Delta Breadth_{t-1}$			2.384***	0.727***		
			(0.000)	(0.001)		
$\Delta Held_{t-1}$					0.215***	0.128**
					(0.000)	(0.013)
A.S.G.	0.099**	0.217***	0.138***	0.222***	0.138***	0.217***
	(0.028)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Size_t$	-0.159**	-0.165***	-0.138***	-0.152***	-0.136***	-0.154***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Sales_t$	0.300***	0.278***	0.279***	0.251***	0.272***	0.261***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Intercept	1.711***	1.878***	1.599***	1.726***	1.579***	1.728***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	6717	14315	11216	17218	10420	16998
Adj. R-squared	0.329	0.320	0.276	0.257	0.273	0.265

Significance levels :   *** : 1%   ** : 5%   * : 10%

Appendix A

- $SDAF_{t-1}$ = standard deviation of analyst forecast over the absolute value of the mean forecast;

- $\Delta Breadth_t$ = Change in the number of funds holding a particular stock from t-1 to t only if the fund is in the sample in both t-1 and t;

- $\Delta Held_t$ = Change in the percent of total outstanding shares held by funds from $t-1\ to\ t$;

- $Size_t$ = ln(book assets);

- $C_t = \frac{C_{i,t}}{A_{i,t-1}} = $ SG & A plus cost of goods sold over lagged assets;

- Alt. $C_t = C_t$ less research and development expense less advertising expense;

- $Sales_t = \frac{S_{i,t}}{A_{i,t-1}} = $ sales over lagged assets;

- NEI_t = Change in book equity less change in retained earnings over lagged book assets;

- NDI_t = Debt issued less debt reduction;

- A.S.G = Three year average sales growth;