

What Determines Cumulative Abnormal Returns? An Empirical Validation in the French Market

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Abstract

This paper tests the factors explaining cumulative abnormal returns. To this end, we examined a sample of 137 firms in 2007. We tested event study methodology to measure the cumulative abnormal returns. An event window spans from -10 days to 10 days. In our study, we considered an estimation period from -20 days to -10 days. For the dependent variable, and after the announcement date (date of the general meeting), we try to estimate the cumulative abnormal returns of 1 day, 2 days, 6 days and 8 days. The empirical results of the cross-sectional model show that the market reacts negatively because of an increase in profitability, firm size and managerial ownership. The opposite effect is observed for leverage. However, the effect of spending on research and development is not statistically significant.

Keywords: cumulative abnormal returns, determinants, event study, managerial ownership, profitability

1. Introduction

Cumulative abnormal returns are the subject of several studies in the financial literature (Chen & Cheng, 2010; Muradog & Sivaprasad, 2011). Authors generally estimate cross-sectional models to test the factors explaining abnormal returns. Like Im et al. (2001), Chatterjee et al. (2002), Dehning et al. (2003), Ferguson et al. (2005), Seoki and Daniel (2010) test the impact of information technology on firm value. They measure shareholder wealth by the cumulative abnormal returns. The authors consider the zero date as the announcement date of a new technology. The empirical results indicate that the impact of information technology on firm value differs by sectors. Ho, Strange and Piesse (2008) found a significant relationship between market debt value and abnormal returns. Papers testing the factors explaining the cumulative abnormal returns in the next section. Section 3 presents our sample which consists of 136 French firms for 2007 in the same section, we introduce our model that explores the factors explaining cumulative abnormal returns as dependent variables, we consider, alternatively, four cumulative abnormal returns. Section 4 presents and interprets our empirical results. The final section concludes with our main empirical results.

2. The Literature Review

Following the methodology of Masulis (1983) and Mikkelsen's (1985), Cornett and Travlos (1989) examine the informational effect of a variation in the capital structure. Cornett and Travlos (1989) begin to calculate cumulative abnormal returns after obtaining financing by debt and equity capital using the event study method as described by Dodd and Warner (1983). Using a sample of 115 US firms for the period 1973 to 1983, the authors found that debt financing leads to higher stock returns equal to 2.81% (Masulis, 1980, 1983; Dann, 1981). This result confirms the wealth transfer hypothesis. However, the issuance of equity negatively and significantly affects stock prices (Masulis, 1980, 1983; Finnerty, 1985; Peavy & Scott, 1985; Asquith & Mullins, 1986). Cumulative abnormal returns in this case are equal to -0.96%.

Like Danbolt and Maciver (2012), Sudarsanam and Mahate (2003), Uddin and Boateng (2009), Min and Agyenim (2015) identify the factors explaining cumulative abnormal returns. The sample consists of 1,063 Chinese firms for a 14-year period from 1998 to 2011. The authors begin to calculate the cumulative abnormal returns using the event study method. They choose two types of event periods; a short event period from -1 day and one day after event day, and a long event period from -10 days to +10 days. The estimation period begins from -240 days to -21 days. First, the authors conclude that the market reacts positively after the date of an event about 2, 3, 4, 5, 6, 7, and

9 days after event day (Nagano & Yuan, 2013). In a second step, the authors analyzed cross-sectional regression cumulative abnormal returns over several explanatory factors, including profitability, size, liquidity, Tobin's Q and ownership structure. The results conclude that the growth opportunities do not affect the abnormal returns. However, the market reacts negatively because of increased profitability (Hartford, 1999). However, liquidity and state equity ownership positively affects cumulative abnormal returns.

Similar to the work of Carhart (1997), Kothari and Warner (2007), Sachin, Michael and Mishra (2015) examine the determinants affecting shareholder wealth for infrastructure firms. Firstly, the authors calculate abnormal returns as the difference between current stock returns and expected returns (Fama & French, 1993). Two events periods were considered; the first runs from -1 days to one day and the second day from -2 day to 2 days. Abnormal returns are negative at event day. The empirical results conclude a statistically significant negative effect of debt ratio on shareholder wealth.

3. Data and Methodology

3.1 Sample Selection

Our paper studies the factors explaining cumulative abnormal returns. To this end, our sample consists of 136 non-financial French firms for the year 2007. Like our paper Hatem Ben Said (2012), firms with positive abnormal returns (P1, P2, P6, P8) and firms with negative abnormal returns (N1, N2, N6, N8) are considered.

3.2 Choice of Variables and Research Hypothesis

Based on the discussion above, and following the methodology advocated by Huey Lian Sun. (1995), we define our dependant and independent variables.

The dependent variable:

Cumulative abnormal returns: Like Richard Cowan (1993) and Huong, Beckman (2006), we measure the cumulative abnormal returns from -10 (- ten) days to 10 (+ ten) days. The date "t = 0" is the date of debt announcement. Cumulative abnormal returns are obtained using the event study method (Brown & Warner, 1980, 1985). In order to test the sensitivity of our empirical results, we use alternatively as dependent variable, CAR1, CAR2, CAR6, CAR8.

Independent variables:

Managerial ownership: managerial ownership is estimated as the shares of the managers of the firm. According to work Robert Houmes and Inga Chira (2015), managers, try, always, to increase their managerial holdings for the most profitable firms, and firms with more growth opportunities. Therefore, a higher managerial ownership transmits a good signal on the financial health of the firm, which will positively affect stock prices. The sign expected for this variable is positive. Hypothesis 1: Managerial ownership positively affects cumulative abnormal returns.

Leverage:

We measure leverage as the ratio of long-term debt divided by equity. Firstly, according to the work of Zmijewski and Hagerman (1981), Leftwisch (1981), an increase in the debt ratio may lead to the bankruptcy of the firm. In this case, the debt negatively affects stock prices. However, a higher ratio may result in a good signal on the management of the firm, which will positively affect shareholder wealth. Hypothesis 2: Debt positively or negatively affects shareholder wealth.

Leverage change:

We measure the change in leverage around the date of debt announcement. According to the work Masulis (1983), Masulis and Korwar (1986), a positive change in debt leads to a tax benefit because of the deductibility of expense interest. In doing so, firm value increase. Hypothesis 3: Leverage change positively affects shareholder wealth.

Firm size:

In a short-term framework we measure firm size by the ratio of long-term debt divided by equity market value. Rajan and Zingales (1995) suggest that external investors are better informed about large firms than small firms. Therefore firm size positively affects shareholder wealth. Hypothesis 4: Firm size positively affects shareholder wealth.

Research and development ratio: Research and development ratio is equal to research and development expenditures divided by total assets. High expenditure on research and development leads to significant future profitability prospects, which will positively affect stock prices. Indeed, a higher value in research and development spending leads to less liquidity for the firm, which reduces the discretion of outside investors.

Therefore, we expect a negative effect of this variable on cumulative abnormal returns. Hypothesis 5: Expenses of research and development positively or negatively affect shareholder wealth.

Systematic risk and unsystematic risk: Systematic risk and unsystematic risk obtained by estimating the market model using the method of ordinary least square. Huey Lian Sun (1995) highlights that they could not predicts the sign or the significance of this variable. Hypothesis 6: Systematic risk positively affects abnormal returns.

Profitability: Differently to Chinpiao and, An-Sing (2015), we measure profitability as the ratio of net income over total assets. Investors seek always to optimize their investments. A higher profitability, stimulate investors to buy more shares, which will favourably affects shareholder wealth. Hypothesis 7: Profitability positively affects abnormal returns.

Table 1. Variables and expected signs

Variables	Abbreviation	Formulation	Expected sign
Cumulative abnormal returns	CAR1	$CAR_1 = \sum_{t=-1}^1 AR_t$	Dependant variable
Cumulative abnormal returns	CAR2	$CAR_1 = \sum_{t=-1}^2 AR_t$	Dependant variable
Cumulative abnormal returns	CAR6	$CAR_1 = \sum_{t=-1}^6 AR_t$	Dependant variable
Cumulative abnormal returns	CAR8	$CAR_1 = \sum_{t=-1}^8 AR_t$	Dependant variable
Managerial ownership	INSIDER	Proportion of shares held by managers	+
Leverage	LEV	LTD/Equity	+/-
Leverage change	CHLEV	change in leverage around the date of debt announcement.	+
Firm size	RSIZE	LTD/equity market value	+
Research and development ratio	R&D	Research and development/TA	+/-
Systematic risk	BETA	Calculated using market model	+
Unsystematic risk	RISK	Calculated using market model	+/-
Profitability	PROFIT	Net income/TA	+

TA: total assets. **AR:** abnormal returns. **LTD:** long term debt

3.2 Models to Be Tested

Like Muradog and Sivaprasad, 2011; Uysal, 2011, Kevin and Ohuocha (2011), we apply this method in 2007 in a short-term framework to examine the determinants of shareholder wealth using the model advocated by Sun, Huey-Lian (1995).

$$CAR_1 = \alpha_0 + \alpha_1 INSIDER + \alpha_2 LEV + \alpha_3 CHLEV + \alpha_4 RSIZE + \alpha_5 R \& D + \alpha_6 BETA + \alpha_7 RISK + \alpha_8 PROFIT + \varepsilon_{it}$$

$$CAR_2 = \alpha_0 + \alpha_1 INSIDER + \alpha_2 LEV + \alpha_3 CHLEV + \alpha_4 RSIZE + \alpha_5 R \& D + \alpha_6 BETA + \alpha_7 RISK + \alpha_8 PROFIT + \varepsilon_{it}$$

$$CAR_6 = \alpha_0 + \alpha_1 INSIDER + \alpha_2 LEV + \alpha_3 CHLEV + \alpha_4 RSIZE + \alpha_5 R \& D + \alpha_6 BETA + \alpha_7 RISK + \alpha_8 PROFIT + \varepsilon_{it}$$

$$CAR_8 = \alpha_0 + \alpha_1 INSIDER + \alpha_2 LEV + \alpha_3 CHLEV + \alpha_4 RSIZE + \alpha_5 R \& D + \alpha_6 BETA + \alpha_7 RISK + \alpha_8 PROFIT + \varepsilon_{it}$$

4. Empirical Results and Interpretations

4.1 Descriptive Statistics

The results of tests differences between the two groups, for 2007, show that all means are statistically significant except "RSIZE", "LEV" and "INSIDER". We highlight an average value of research and development ratio of 2.01%. Firms are matured size (an average size of 0.331). This result means that the long-term debt is about equal to one third of market value equity. With an increase in stock prices, managers choose to finance investment projects by debt emission. In fact, the cost of debt is lower than equity cost. Descriptive statistics for the whole sample conclude, also, that the debt is equal to 37.8% of the equity. A small change in leverage is found (3.29%).

The French companies have a low profitability for 2007 (5.38%). However, managerial ownership is important (32.5%).

4.2 Empirical Results

After checking the overall significance of our models, the empirical results for the entire sample is presented in the table 3. The results conclude that our dependent variables explain between 20.19% and 31.98% of the cumulative abnormal returns. The highest correlation coefficient is concluded for CAR8. However, the constants in our models are not statistically different from zero. This result suggests that there is no other independent variables that explain shareholder wealth measured by cumulative abnormal returns.

Managerial ownership: The results indicate also that the managers try to increase their shareholders equity shares in the event of a positive reaction (groups, “P1”, “P2” and “P6”) and decrease their shares in the opposite case (groups, “N1”, “N2” and “N6”). This result confirms hypothesis 1.

Leverage: it supports the disciplinary role of debt for the specification “ENTIER 8”. However, debt positively affects firm value of the firm for the “P2” group (Jensen, 1986). This finding contradicts the argument of Zmijewski and Hagerman (1981) and Leftwich (1981) who emphasize that an increase in debt increases bankruptcy cost which negatively explains shareholder wealth. This result confirms hypothesis 2.

Leverage change: Differently to Masulis and Korwar (1986), change in leverage do not affects significantly shareholders wealth, and consequently firm value. Indeed, an increase in leverage leads to taxes savings. These savings can be attributed to the interests deductibility. Therefore, there is an increase in cash flows in the hands of managers. Then, external investors do not react positively following the increase of internal resources. This result can be explained by opportunistic behaviour of managers, and that external investors want to secure their investment funds. This result reject hypothesis 3.

Firm size: according to the result of Miller and Rock (1985), firm size negatively affects shareholder wealth for the specification “P1”. This result confirm hypothesis 4.

Research and development: According to the results of Huey-Lian Sun (1995), the coefficient on R & D variable is not significant. this result means that research and development expenses do not affects abnormal returns. However, generally, high expenses for research and development provides the higher returns This has an effect of increasing stock prices and, therefore, abnormal returns. this case is not found for French companies. This result reject hypothesis 5.

Systematic and unsystematic risk: The results show also that an increase in systematic and unsystematic risk (Fama & French, 1993) reduces shareholder wealth. The most growing firms have higher systematic risk. This result confirm hypothesis 6.

Profitability: Contrary to what is expected, an increase in profitability inversely affects shareholder wealth. Indeed, an increase in profitability increases liquidity in the hands of managers. This increasing liquidity increases managers entrenchment behaviour and sends a bad signal to outside investors. There is, therefore, a decrease in shares prices for French firms, and consequently, abnormal returns. This result reject hypothesis 7.

Table 2. Descriptive statistics

VARIABLES	CAR1		CAR2		CAR6		CAR8		
	ENTIER	P1	N1	P2	N2	P6	N6	P8	N8
R&D	0.0201***	0.0226***	0.0181***	0.0260***	0.0163***	0.0331***	0.00868***	0.0247***	0.0166***
RSIZE	0.331	0.325	0.336	0.351	0.319	0.302	0.358	0.320	0.341
LEV	0.378	0.370	0.385	0.376	0.380	0.351	0.404	0.404	0.358
CHLEV	0.0329***	-0.0716***	0.117***	0.0431***	0.0269***	0.00408***	0.0568***	-0.0532***	0.0932***
PROFIT	0.0538***	0.0422*	0.0639	0.0452*	0.0595	0.0473*	0.0600	0.0483	0.0583
INSIDER	0.325	0.344	0.308	0.303	0.339	0.289	0.357	0.328	0.323
RISK	0.00127***	0.00000993***	0.00237**	-0.0005***	0.00245**	-0.000483***	0.00284*	-0.00103***	0.00310
BETA	0.405***	0.382**	0.426**	0.353*	0.440**	0.429*	0.385**	0.428*	0.388**

Note . , ** , *** : significance at 10%, 5% and 1% levels respectively

Table 3. Factors explaining cumulative abnormal returns

VARIABLES	CAR1			CAR2			CAR6			CAR8		
	ENTIER1	P1	N1	ENTIER2	P2	N2	ENTIER6	P6	N6	ENTIER8	P8	N8
C	0.00227	0.00827	-0.0036	0.000278	0.0114*	-0.0142*	0.00523	0.0125*	-0.033***	-0.00305	0.0113	-0.029***
R&D	0.0308	0.0415	-0.0249	0.0453	0.00294	0.00299	0.0291	-0.235	0.0909	0.0337	0.0149	0.0322
RSIZE	-0.00664	-0.023***	0.00188	0.000335	-0.0176*	0.00458	-0.00192	-0.00608	0.0276	-0.0138	-0.0170	0.00724
LEV	0.00743	0.00940	0.00362	0.00610	0.0156*	0.00879	-0.00487	0.00717	-0.00600	0.0193*	0.0229	-0.00816
CHLEV	-0.00335	0.00387	-0.0058	-0.00558	-0.00422	-0.00771	-0.00403	-0.00506	-0.00756	-0.00441	-0.108	0.00571
PROFIT	-0.0681**	-0.0313	-0.0141	-0.0418	-0.0618	0.0147	-0.0110	0.0313	0.0676	-0.0402	0.0135	-0.0113
INSIDER	0.000225	0.048***	-0.042***	-0.00615	0.0364***	-0.04***	-0.0133	0.0364***	-0.0319*	-0.0144	0.0218	-0.039***
BETA	-0.00238	-0.0071*	-0.0020	-0.00681*	-0.00087	-0.0023	-0.00624	-0.0644	-0.00107	-0.00235	0.00985	0.00386
RISK	-2.601***	-0.706	-1.601**	-3.722***	-0.787	-2.12***	-5.993***	-2.914***	-3.214***	-6.884***	-0.979	-2.583**
R ²	20.19%	45.41%	17.25%	24.207%	35.52%	12.17%	29.36%	19.97%	15.75%	31.98%	2.04%	12.32%
F	2.973	5.574	2.486	3.753	3.548	2.108	4.884	2.467	2.262	5.526	1.102	2.0185
Test chow	16.809***			12.543***			16.068***			16.125***		

Note. *, **, ***: significance at 10%, 5% and 1% levels respectively.

5. Conclusion

Generally, investors invest their funds in the purchase of shares. These investors seek to profit by generating higher returns. This work tests the factors influencing the cumulative abnormal returns. As a method of estimation, we use the event study method. An event period and an estimation period were constructed. The event date represents the date of the general meeting. We tried to explain the cumulative abnormal returns through several explanatory factors, including R&D, profitability, size and leverage. Our results show that spending on research and development does not affect shareholder wealth. An increase in debt weakens the opportunistic behaviour of managers, and therefore increases firm value. In contrast, profitability, managerial ownership and firm size negatively affects abnormal returns.

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