

# Innovation and Performance during the Financial Crisis: The Case of French Firms

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## Abstract

This research is a contribution to establish an empirical background on the capacity for innovation in French firms listed on the SBF 120 covering the period before and after the financial crisis. The purpose of this research paper is to analyze the factors that influence the capacity for innovation and to prove the existence of a possible relationship between the innovation capacity and the performance. Firstly, the study reveals that research and development expenditure has a negative impact on the financial performance of SBF 120 firms during the period from 2004 to 2016.

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*Index terms*— innovation, performance, research and development, plurality functions of manager.

## 1 I. Introduction

he relationship between financial innovations, which are often associated with liberalized and deregulated markets, and macroeconomic stability has become a very controversial economic issue. The financial crisis of 2007/2008 brought to the fore the inquiry about the positive role of the evolution of financial markets in the economic stability.

So far there have been many investigations on the impact of innovation on firms' financial performance, which come out with mixed results. This study examines the possibility that business innovation improves financial performance by allowing the firm to be distinguishable.

Studying the SBF 120 firms' innovation has not received enough attention through academic research. Recently, a considerable effort to conceptualize the scope of the strategy has been provided for the first time by Hoskisson et al. (2000). Four conceptual perspectives transaction cost theory, agency theory, and institutional theory -were analyzed by these authors in 64 countries. Using the same analytical approach, other more targeted research focused on countries in Asia and Central Eastern Europe (Peng et al., 2001; Meyer and Peng, 2005). One of the main purposes of this research is to assess whether the theories and methodologies used to study this strategy in the developed countries are appropriate for the diverse socio-economic contexts and different firms of given characteristics.

For several years, there has been some fascination for innovation, both at the theoretical and practical levels. Indeed, Berrone et al. (2013) highlight its current popularity in the business community. This study reveals that over 90% of senior managers believe that innovation is fundamental to achieving their strategic and financial goals. However, only half of the main innovations and the strategies that were improved met the hoped-for objectives on the market side as well as on the of the firm side. This ascertainment might lead to many conflicts within the agency. As a matter of fact, for nearly two decades, French firms have undergone some of changes, the most important of which is the growing importance of innovations in the process of value creation. This advancement questions the need for a renewed conception of the corporate governance.

Several authors (Wang and Ahmed, 2004; ?utton, 2002; focus on the benefits of continuous development of new studies and up growth research and development investments for organizations. Even today, the failure rate of new investment decisions remains high (Genus and Coles, 2008). We find that many studies agree that on the one hand innovation is an interesting source of competitive advantage (Straska and Waller, 2010). On the other

45 hand, firms can only take full advantage of progress when all functional activities support innovation. The latter  
46 is generally related to the terms research and development. Also, modernization includes the process of driving  
47 the new technology into use. Achieving this essential activity for the organization improves and maintains its  
48 position in the market.

49 According to Bhagat and Garg (2008), research is about developing new knowledge while development is  
50 about applying knowledge and increasing the application possibilities. All managers testify to the crucial role of  
51 research and development activities. More specifically, it is a strategic function (Munari, 2002). Indeed, research  
52 and development is the very heart of a firm's innovation capacity. Respectively, investment in research and  
53 development has risen in recent years. Technological evolutions, competition and financial benefits are at the  
54 origin of an important industrial event, led by firms: The race for innovation is increasingly based on the firm's  
55 specialized resources (Hatch and Dyer, 2004; Tsai and Wang, 2009).

56 Besides, all developed and emerging countries have been affected by the financial crises. These crises have  
57 taken very different forms: banking, stock market, and real estate crises. If we look at the statistics, there is  
58 about one crisis every two years, that is to say, a financial shock that results in falling stock prices or bankruptcies  
59 chain banks. According to ??rléans (2009) in the World between 1970 and 2007, there were no less than 124  
60 banking crises, 208 currency crises, and 64 sovereign debt crises. The crisis "subprime," which hit the sector  
61 subprime mortgages is a crisis of enormous severity: all economists agree that it is the most serious regarding  
62 importance and depth since the crisis of 1929.

63 What follows is an enumeration of the major causes behind a crisis. There are three fundamental causes. First,  
64 financial globalization process makes global economies more interdependent. Second, the policies of economic  
65 liberalization give a great freedom of action to the financial actors. Indeed, the freedom of activity granted to  
66 the financial actors favors the international circulation of capital and contributes to globalizing crises. Third,  
67 a wave of unprecedented financial innovations that have weakened the international financial system and whose  
68 role has been underestimated, yet historical experience shows that they are at the very heart of crises.

69 Entrepreneurial innovations are supposed to be one of the key sources of economic growth and competition  
70 is seen as an incentive to innovate. Schumpeter (1947) points out that perfect competitiveness from textbooks  
71 through the hypotheses ad hoc on the atomicity of agents. The homogeneity of goods and services contradicts  
72 the intuition one might have about the role of incentives to innovate. The same objection can be considered  
73 about the financial sector. Bluntly, Minsky (1986) identifies the issue of the evolution of financial systems  
74 regarding productive activities as a principal problem in a monetary market economy. When the focus of  
75 financial innovations is on speculative profitability strategies, the financial fragility is endogenously increased  
76 and reflects the incapacity of micro-prudential regulatory schemes to meet the assumptions of efficient markets.  
77 Macroeconomic stability then calls for a redefinition of regulatory mechanisms

78 We contribute by this article to the literature related to the performance of firms by studying the impact of  
79 research and development expenditure on the performance of the firm in the French context. Few studies have  
80 previously discussed the relationship that may exist between these expenditures and performance on the French  
81 setting. Also, our study is one of the first studies that analyze the effect of the financial crisis of 2008 on the  
82 relationship between innovation and the firm's performance. We also contribute by studying the plurality of the  
83 functions of the manager on the firm's performance.

84 The object of this study is to define the impact of research and development expenditures on firms' performance  
85 for the case of French firms and the effect of the Subprimes crisis on this relation. Therefore, this paper is  
86 structured as follows: The first section reviews the relevant literature and hypothesis development. The second  
87 section presents our methodology, while the third section focus on the results obtained. In the last one, we make  
88 a conclusion.

## 89 2 II. Literature Review and Hypothesis Development

90 The theoretical foundation of this work lies primarily on the concept of innovation developed in 1939 by the  
91 economist Joseph Schumpeter, who gave a prime role to innovation activities for the evolution of capitalist  
92 societies.

93 In this respect, several theorists (Lau, 2009; Czarnitzki and Kraft, 2003) have indicated that economic growth  
94 is endogenous to innovation. There is an increase in the level of knowledge and intellectual capital of innovative  
95 firms thanks to innovation. Thus, it varies in importance from one firm to another which is explained by the  
96 preferences of those responsible for investment decisions, who possess discretionary decision as to the prominence  
97 and choice of innovative activities.

98 Some authors consider that the competitive advantage that a firm has is possible through continuous  
99 innovation (Huang et al., 2010). Henceforth, firms may orient their efforts to creating value and creating  
100 organizational knowledge. Modernization, resulting from research and development activities, can be considered  
101 as a transformation of skills into economic activity. Following the globalization of markets, firms are facing  
102 international competition. These firms must, therefore, be innovative to survive in changing environments (Ding  
103 and Stolowy, 2003).

104 Therefore, and according to Charreaux and Desbrières (2001) firms, adopting innovation strategies, have the  
105 power to increase or maintain their market shares, while leading a competitive advantage over other firms. The

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106 strategic decision to undertake innovative activities, hence, leads to the economic growth of the markets and the  
107 long-term profitability of the firms (Azadegan, 2011).

108 There are many studies on the impact of innovation on the long-term performance of firms. Some research  
109 has found a positive relationship between innovation and the value of societies (Hill and Snell, 1988). In their  
110 study analyzing the effect of organizational control on innovation decisions, Yang et al. (2010) find a positive  
111 relationship between innovation and corporate profitability. Thus, Gunduz (2013) analyzes the interdependence  
112 of investments and the value of firms and finds that capital investment positively affects the worth of firms.

113 The positive relationship between innovation and performance could also be interpreted by the importance of  
114 the control measures used in firms adopting innovation strategies. Research indicates that firms assuming such  
115 procedures use strategic control measures (Gurhan et al., 2011; Yang, 2010), while firms following other strategies,  
116 such as diversification, and apply performance-based controls. Guan et al. (2009) examine how innovation affects  
117 firm performance. They argue that the relationship between investment and sales differs significantly from firm to  
118 firm. Firms that invest heavily are more competent to be the best to increase their income and profits. Through a  
119 sample of manufacturing firms, Yam et al. (2011) observed that sales, the growth of innovation and the return on  
120 assets (ROA) are very high for firms which pay extensively compared to the firms which spend less on innovation.  
121 According to North et al. (2001), the innovation strategy is a source of competitive advantage, for it signals  
122 to investors and other stakeholders that their business is growing. Thus, executive managers are launching a  
123 signal based on increased research and development spending. So it is by capturing this announcement that  
124 the financial market reacts positively. These analysts point out that such projects contribute in particular to  
125 productivity and value creation. Henceforth, there is a positive correlation between business performance and  
126 innovation investments.

127 Dechow and Schrand (2010) note that research and development investments vary according to the discretion  
128 and preferences of senior management. Consequently, the second theoretical foundation is rooted in the agency  
129 theory developed by Jensen and Meckling (1976), which states that the ownership structure and the board of  
130 directors are mutually determined as well by the nature of the firm's activities. They also show that these  
131 governance mechanisms interact with each other and subsequently influence the firm's performance.

132 Obvious enough, by linking the concept of innovation to agency theory, we can evoke the underlying assumption  
133 of our study, which predicts the existence of an interaction between innovation choice, governance structure, and  
134 performance of the firm. This interaction leads to two types of relationship to be investigated, namely the factors  
135 that may explain the adoption of innovation projects and their consequences. It should be noted that we use  
136 research and development investments as a measure of innovation.

137 Zheng (2014) shows the existence of a direct and positive correlation between innovation investment, economic  
138 growth, and firm's earnings. As for Gunday et al. (2011), they believe that innovation is synonymous to better  
139 growth opportunities, which impact the firm's performance positively.

140 To magnify the value of the firm, the manager is required to take many advantageous measures. The manager  
141 is required to undertake investments for many reasons. First, investments allow him to increase the consumption  
142 of the assets. Second, it permit him to be more interested in the cash flow that can be realized during the period  
143 of his mandate to increase his remuneration and consequently the firm's value. He must also seek some invested  
144 shares to invest in the firm. Not only must he to take into account the effect of research and development  
145 projects on the hoped-sales, but he must also guarantee a liquidity return as a dividend when unprofitable  
146 investments are not available and also achieve investments whose revenues manage to cover their costs. These  
147 above mentioned measures illustrate that innovation has a tremendous impact on performance.

148 Based on the previously mentioned theoretical and empirical foundations, our supposition can be deduced  
149 such: Hypothesis 1: Performance positively affects innovation.

### 150 3 III. Methodology a) Sample Selection and Data

151 On the whole, our sample is made up of French listed firms. The study depicts the period extending from  
152 the year 2004 until the year 2016. The data related to the duality of the functions of the manager were  
153 collected manually from the financial reports while the other data relating to the characteristics of the firms  
154 were collected from multiple resources such as straight forward data, World scope database, Data stream, as well  
155 as the Guru Focus database. The selected firms belong to ten sectors. We adopt the global industry standard  
156 classification system, Industry Classification Benchmark (ICB) adopted by Euro next to classify the listed firms  
157 into homogeneous business segments. We took the ICB, which divides firms into ten major groups. The table 1  
158 shows the distribution of French firms by industry and then by the super sector. Technology Technology Also, we  
159 excluded missing data from our observations and we winsorised data at 2% of each end of our data distribution.

### 160 4 b) Econometric Modeling

161 To assess the hypothesis that we have suggested to study the impact of innovation on the performance of the  
162 French firms, the following model has been established: Growth: The growth of the firm measured by the growth  
163 rate of sales between year  $t$  and  $t-1$ .  $g_{t,t-1} = \alpha + \beta_1 g_{t-1,t-2} + \beta_2 g_{t-2,t-3} + \dots + \beta_k g_{t-k,t-k-1} + \epsilon_t$

### 5 Liquidity:

The ratio of general liquidity measured by the ratio between current assets and current liabilities. Size: The size of the firm measured by the natural logarithm of total assets. CAPEX: Ability of investment of the firm measured by the ratio of new capital asset acquisitions to total assets. Leverage: The debt ratio firm measured by the ratio between total debt and total assets.

### 6 MTB:

The market to book ratio measured by market capitalization on the total assets of the firm. Cumul: Is a dichotomous variable which takes the value of 1 if the general direction of the firm and the presidency of the board of directors is ensured by the same person and 0 otherwise.

## 7 IV. Results and Discussion

### 8 a) Descriptive Statistics

What follows present the descriptive statistics and the correlation analysis of all the variables used in our study.

Table 2 presents the descriptive statistics of all dependent and independent continuous variables. The average performance of the firms in the study sample is 0.031 with a variance of 0.080. The average value of innovation expenditures is 18.70 for a 1.69 of standard deviation, and 75% of the firms in our sample have spent on research less than or equal to 20,022 development. Regarding the risk variables, we note that the average beta is 0.982 and a standard deviation of 0.219, so the market varies by 10%, the firms' shares move 9.82%. Regarding operational risk, we find out that the average is 2.013 and the variance is equal to 7.530, reaching a maximum value of 134.121, which indicates the diversity of our sample. The average growth of the firms in the study sample is 7.4% and a maximum value of 7.008. The average investment capacity is 20,646 with a variance of 14.04, so we can once again assert the diversity of our sample and that firms do not have the same capital expenditures. The average value of liquidity ratio is 1,484 which allow us to conclude that firms finance their current debts by their current assets and 75% of the firms in our sample have a liquidity ratio lower than or equal to 1,628. The debt variable has an average value of 0.153 and a variance of 0.105, so the debts of the firms in our sample represent 10.5% of the total assets, we have to also mention that our sample contains firms in debt and those that are not indebted. Table ?? displays the correlation coefficients of Pearson and Spearman between the different variables in our study. According to the Pearson and Spearman coefficients, we noticed that there is not a problem of correlation between the variables and for that we can resort to the estimation of our model. For this, we opt for Thompson's double clusters method (2009) which takes into account the correction of the heteroscedasticity problem.

### 9 Table 3: Correlation Analysis

The coefficients that are located above the diagonal are those of Pearson and those of Spearman are below the diagonal.

### 10 b) Results of Explanatory Analyzes

Table 4 presents the results of the model estimates, which highlight the potential relationship between innovation and business performance. The coefficient of innovation is negative and significative at the 1%. This result suggests that spending on research and development negatively affect the performance of the French firm. Indeed, new technologies from research and development are not necessarily translated into better accomplishments. ??su et al. (2013) suggested that research and development processes are tainted by uncertainties and do not meet the estimated expectations. Also, newly designed products may encounter unexpected manufacturing problems or may not be commercially viable. Besides, profits from new products cannot justify the expense of research and development required to develop such products and research and development expenses is becoming a very costly procedure. Thus, research and development expenses have a negative impact on the current performance of the firm. Nevertheless, the accumulation of experience in research and development could improve the future performance of the firm.

The cumulative function of the manager (Cumul) has a negative and significant effect on the performance of the French firm. The agency's theory suggests that the separation of director and board chair positions facilitates more the direction and the control of the executive and that firms, which fail, maybe underperforming those that separate the first two positions (Rechner and Dalton, 1991). In fact, the manager chairs the board of directors, who evaluates his work, goes against the goal of having a board of directors. Because the duality of the manager points out that there is no separation between decision management and decision control (Fama and Jensen, 1983), and the board will not be able to monitor and to evaluate the manager effectively. Indeed, the manager is more likely to use his power as Chairman to select the directors, who are not expected to challenge his decisions (Westphal and Zajac, 1995). As a result, a board that is officially controlled by the firm's manager may lack independence and vigilance, which leads to more agency problems and subsequently poor performance by the firm (Pi and Timme, 1993;Rechner and Dalton, 1991).

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220 As far as risk is concerned, the market risk ratio (BETA) is negative and significant at the 10% threshold,  
221 while operational risk has no significant impact on the performance of French firms. The market risk generates  
222 an instability of results and cash flow and consequently deterioration of the firm's performance ??Dhaniniet al.,  
223 2007;Goldberg and Drog, 2008;Ammon, 1998).

224 Operational risk (Risk), which represents the uncertainty associated with the operating environment of the  
225 organization and reflected in the changes in the operating result, has a negative impact on the performance of  
226 the firm. By taking the risk, a firm can benefit from exceptional short-term profitability by accepting high levels  
227 of risk, but it is not able to cope with long-term negative industrial conditions which results in a low level of  
228 performance, leading to poor financial performance for the firm (Liargovas and Skandalis, 2010).

229 Regarding the relationship between liquid assets (Liquidity) and the performance of the firm, it is negative  
230 and significant at the 1% threshold, proving that firms with important liquid assets are the best performers.  
231 By holding back money, managers do not distribute dividends even if they do not have captivating investment  
232 opportunities (Blanchard et al., 1994). Moreover, managers may spend money to improve their utility, but do not  
233 necessarily increase the value of the business (Jensen, 1986). These firms, holding liquid assets, invest in projects  
234 that subsequently fail and have a negative impact on the firm's performance (Evans and Jovanovic, 1989; ??vide  
235 and Moen, 2007).

236 We also noticed that the leverage factor (Leverage) is negative and significant at the 10% level. This result  
237 stipulates that profitable, and highperforming firms are more dependent on equity as the principal financing  
238 option, while those that are not performing are dependent on external financing (Shubita and Alsawalhah, 2012).

239 The size of the firm (Size) has a positive and significant impact at the 1% level. Large firms are the most  
240 successful firms since they own more resources, better risk diversification and better management of expenses.  
241 Large firms are apt to have more resources and opportunities when using the capital market (Gupta, 1969). Worth  
242 noting is that firms can achieve better performance through more reasonable economies of scale, more promotion  
243 opportunities, improved asset efficiency, capital, technology management, and other operational synergies.

244 The market to book (MTB) coefficient is positive and significant at the 1% level. The relationship between  
245 growth opportunities and performance is positive. Firms with weighty investment opportunities have good  
246 performance. Indeed, the long-term value creation and assumption of Chemmanur and Jiao (2012) predicted  
247 that for firms with a more talented manager and the stronger croissant options have better performance (Cox et  
248 al., 2017). 5 shows the results relating to the impact of the subprime financial crisis on the association between  
249 innovation and corporate performance. We observed that the crisis (Crisis) has a positive and significant effect  
250 on this relationship, which led us to study the relationship between innovation and firm performance during the  
251 pre-crisis period and the postcrisis period. The results are shown in Table 5. As far as the duality of the duties of  
252 the executive (Cumul) is concerned, it keeps its negative and significant sign highlighting the adverse effect of the  
253 combined management of the firm and the board of directors on the performance and this result persist during  
254 both precrisis and post-crisis periods. The results of analysis of the period precrisis and post-crisis are in Table  
255 6. For innovation (Innovation), we find that its negative relationship with performance persists in both periods.  
256 This negative relationship is explained by the fact that the process of research and development are subject to  
257 uncertainty and does not achieve expectations and new products innovation are not necessarily translated into  
258 better performance.

259 Market risk (Beta) keeps its negative and significant effect on performance during both periods, while the  
260 firm's operational risk loses its significance during the post-crisis period. The explanation of this finding is that  
261 the financial risk is more essential for the survival of the firm during this period of credit and it is this risk that  
262 must be managed as quickly as possible so as not to affect the performance of the firm.

263 Moreover, growth opportunities (MTB) remain positive and significant during the post-crisis period and liquid  
264 assets (Liquidity) also maintain their negative relationship with performance during the pre-and postcrisis period.  
265 This finding suggests that managers hold the money to satisfy their own interests and invest even more during  
266 this period of crisis in unprofitable projects, which affects the performance of the firm. Leverage maintains its  
267 negative and significant effect on performance during the pre-crisis period but loses its significance during the  
268 post-crisis period. Farthermore, the firm's size (Size) has a positive but not significant effect during the pre-crisis  
269 period. However, it regains its significance during the post-crisis period as large firms are the ones that survive  
270 during crisis given the diversification of their activities.

## 271 11 V. Conclusion

272 In this article, we have examined the relationship between innovation and business performance. The idea is that  
273 research and development expenditures allow the firm to develop new products and whether these new products  
274 are able to improve its performance. On the other hand, this article also examines the impact of the subprime  
275 crisis on this relationship that may exist between innovation and performance. The sample of the study is made up  
276 of French firms during the period between 2004 and 2016, and we found that research and development expenses  
277 negatively affect the financial performance of the firm. This negative relationship is explained by the uncertain  
278 criterion of this innovation and the importance of the costs of research and development that may exceed the  
279 revenues generated by these investments. We have also found that this negative relationship persists during the  
280 periods before and after subprime crises. The measure of innovation used can be improved in future research by

281 taking into account the different types of research and development expenditures separately to identify which of the research and development components have effect on the performance of the firm.

1

|                        |   |
|------------------------|---|
| Industry               | Super Sectors   |
| Oil and Gas            | Oil and Gas   |
| Basic materials        | Chemistry, Raw materials  |
| Industries             | Industries  |
| Consumer goods         | Automobiles and equipment manufacturers, agri-food and beverages, household and personal care products. |
| Health                 | Health  |
| Consumer Services      | Distributions, Media, Travel and Leisure  |
| Telecommunication      | Telecommunication   |
| Community Services     | Community Services  |
| Financial corporations | Banks, Insurance, Real Estate, Financial Services, Investment Instruments.                              |

Figure 1: Table 1 :

With:

ROA: The firm's performance measured by the ratio between earnings before interest and taxes and total assets.

Innovation: The natural logarithm of total research and development.

*[Note: Beta: The market risk of the firm measured by the volatility of the securities of the firmi at the moment t. Risk: The operational risk of the firm measured by earnings before interest and taxes divided by income after interest and taxes.]*

Figure 2:

2

| Average | Std.  | Minimum | Median | Q1     | Q3     | Max    |
|---------|-------|---------|--------|--------|--------|--------|
| 0031    | 0080  | -0658   | 0042   | 0015   | 0066   | 0224   |
| 18708   | 1690  | 12.190  | 18,800 | 17619  | 20,022 | 22,363 |
| 0981    | 0219  | 0490    | 0998   | 0940   | 1,000  | 1,770  |
| 2.013   | 7.530 | 38315   | 1,570  | 1364   | 1829   | 134121 |
| 0074    | 0441  | 1000    | 0045   | -0.010 | 0109   | 7008   |
| 20646   | 14401 | 0087    | 18247  | 9643   | 28328  | 62694  |
| 1484    | 1.195 | 0403    | 1267   | 0989   | 1628   | 14737  |
| 22825   | 1689  | 17742   | 22793  | 21666  | 24131  | 26358  |
| 0153    | 0105  | 0       | 0146   | 0079   | 0204   | 0609   |
| 0973    | 0.861 | 0029    | 0725   | 0414   | 1272   | 9507   |

Figure 3: Table 2 :

4

|                         | Coefficient | Student's T |
|-------------------------|-------------|-------------|
| Constant                | -0089       | (-0.92)     |
| Cumul                   | -0.009 **   | (-2.34)     |
| Innovation              | -0006 ***   | (-3.22)     |
| Beta                    | -0021 *     | (-1.68)     |
| Risk                    | -0.00007    | (-0.55)     |
| Growth                  | -0.010      | (-0.81)     |
| CAPEX                   | -0.0003     | (-1.14)     |
| Liquidity               | -0023 ***   | (-4.13)     |
| Size                    | 0012 ***    | (2.70)      |
| Leverage                | -0.060 *    | (-1.88)     |
| MTB                     | 0036 ***    | (3.00)      |
| N                       | 544         |             |
| R <sup>2</sup> Adjusted | 0.2382      |             |
| Fisher                  | 10.64 ***   |             |

Figure 4: Table 4 :

5

|                         | Coefficient | Student's T |
|-------------------------|-------------|-------------|
| Constant                | -0086       | (-0.87)     |
| Cumul                   | -0.008 **   | (-2.22)     |
| Innovation              | -0.006 ***  | (-3.17)     |
| Beta                    | -0.024 *    | (-1.88)     |
| Risk                    | -0.0001     | (-0.91)     |
| Growth                  | -0011       | (-0.89)     |
| CAPEX                   | -0.0003     | (-1.14)     |
| Liquidity               | -0.023 ***  | (-4.04)     |
| Size                    | 0.012 ***   | (2.66)      |
| Leverage                | -0.065 **   | (-2.00)     |
| MTB                     | 0.035 ***   | (2.83)      |
| Crisis                  | 0.011 **    | (2.33)      |
| N                       | 544         |             |
| R <sup>2</sup> Adjusted | 0.2410      |             |
| Fisher                  | 11.62 ***   |             |

Figure 5: Table 5 :

6

|                         | Pre-Crisis          | Post-Crisis        |
|-------------------------|---------------------|--------------------|
| Constant                | 0.259 (1.49)        | -0.182 * (-1.93)   |
| Cumul                   | -0.014 ** (-2.33)   | -0.008 * (-1.81)   |
| Innovation              | -0.008 * (-1.99)    | -0006 *** (-2.87)  |
| Beta                    | -0.031 * (-1.71)    | -0027 * (-1.89)    |
| Risk                    | -0.0004 *** (-2.94) | 0.0001 (0.35)      |
| Growth                  | -0.083 ** (-2.60)   | -0.004 (-0.29)     |
| CAPEX                   | 0.0008 (1.41)       | -0.0006 * (-1.80)  |
| Liquidity               | -0.019 ** (-2.53)   | -0.022 *** (-3.42) |
| Size                    | 0.001 (0.20)        | 0016 *** (3.18)    |
| Leverage                | -0.084 ** (-2.18)   | -0043 (-1.16)      |
| MTB                     | 0010 (0.58)         | 0052 *** (8.70)    |
| N                       | 145                 | 399                |
| R <sup>2</sup> Adjusted | 0.2743              | 0.2877             |
| Fisher                  | 11.86 ***           | 22.10 ***          |

Figure 6: Table 6 :

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