

“The Effect of Ownership Structure on the Innovation Process”

MASTER THESIS

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1- ABSTRACT:

Innovation is the main engine of growth. Research on the link between (product) innovation and profitability at the firm or establishment level suggests that innovators are persistently more profitable than non-innovators (Geroski et al., 1993; Leiponen, 2000; Cefis and Ciccarelli, 2005). Although innovation is generally regarded as a means of improving the competitiveness of firms and their performance on domestic and foreign markets, this relationship has not been supported unambiguously by empirical work. In this context this article aims to increase the empirical evidence by analyzing the moderator effect of ownership characteristics on innovation process. Specifically this paper evaluate the effects of some characteristics related to the ownership structure, such as legal status, characteristics and number of owners (familiar business...), and innovation behavior of the firm (innovation input, innovation output) to financial performance. The database used is Kauffman firm Survey (KFS) which is the largest longitudinal study of new business ever embarked upon. With this database we analyzed the sign of ownership to the performance and how the effect of innovative output/input varies when different Ownership concentration index.

Key words: Financial performance, Ownership characteristics, Innovation output & input.

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1-INTRODUCTION

Innovation capacity is, nowadays, recognized as one of the main factors on the firms competitive advantage. Therefore, it is important to learn on the nature of innovation, how it influences both economic and financial results and the mechanisms through which social and economic agents get involved in the whole *innovation process, always bearing in mind that innovation management is intrinsically difficult and risky*. Research on the link between innovation and profitability at the firm or establishment level suggests that innovators are diligently more profitable than non-innovators (Geroski et al., 1993; Leiponen, 2000; Cefis and Ciccarelli, 2005).

Innovators are able to insulate themselves from market forces to some degree: in the case of indigenous plants, at least part of this is because of innovating itself. However, the fact that innovation per se has a negligible effect on the profitability of indigenous innovators at the upper end of the profitability distribution supports the view that it is not the quasi monopoly rents of innovation which distinguishes the most profitable innovators from the rest, but the fact that these plants have capabilities or competences which others lack. These capabilities may be linked the process of innovation, but they are unlikely to be solely related to innovating. Innovation affects the degree to which firms can enhance their productivity (Tellis, Prabhu and Chandy, 2007; Comin and Philippon, 2005). It also influences firms' ability to penetrate into new markets, including foreign ones, or preserve their market leadership (Geroski, 1995).

Moreover, when a new technology is introduced entrepreneurs have a strong incentive to add risk (Gonas, Highfield, and Mullineax, 2004). An innovation requires large up-front effort and start-up costs (see, e.g., Hall, 2005). Innovations generally have little salvage value: at the R&D stage, investments consist mostly of salaries and intangible assets (e.g., intellectual property); at the adoption stage, the assets that embody the innovation are specific to the firm (Carpenter and Petersen, 2002; Hall and Khan, 2003). These various features of innovation are relevant for agency problems and for the impact of governance (ownership structure) on the principal-agent relationships inside firms.

Innovation can thus be a critical element in improving the economic and financial results of firms and the performance of national economies. Recent research confirms that an increased economic and financial performance is observed among firms capable of using innovation to improve their processes or differentiate their products and services in relation to their competitors. In light with this perspective, the study of the relationship between innovation dynamics and ownership structure and financial performance is very relevant, in the context of academic and business research. A revision of the existing literature has shown that there are few studies addressing the impact of ownership structure on innovation process and the firm's economic and financial performance and that most of them are, to some extent, incomplete due

to a partial analysis of the subject, i.e. the analysis is not based on a complete list of all the relevant factors influencing innovation.

The main purpose of this paper is to establish a better understanding of the innovative performance of companies and evaluate the effects of some characteristics related to the ownership structure, such as legal status, characteristics and number of owners, and how they could possibly effect the innovation process. The effect of innovation input (measured as *R&D expenditures*), innovation output (measured as the *number of patents, copyrights and trademarks*) to the financial performance (profit and losses divided per employees) was measured.

In this study, an existing database KFS was applied : the Kauffman Firm Survey (KFS) which is the largest longitudinal study of new businesses ever embarked upon and the effect of ownership characteristics on innovation process can be calculated with different control variables. The KFS sought to create a panel that included new businesses founded by a person or team of people, purchases of existing businesses by a new ownership team, and purchases of franchises. For this proposal, it used the date with the period 2004 to 2011. The results obtained show that innovation has a negative impact on firms' financial performance.

The structure of the paper is as follows. In chapter 2, the related theoretical literature to the innovation process and its effect on the firm performance and ownership moderator role on firm's performance was discussed. The relationship between innovation and firm's performance and ownership construction presented by distinguishing the following stages: innovation input, innovation output, ownership concentration how they affect the financial performance of the firm and how the effect of Innovative output/input varies when different Ownership concentration index. In chapter 3, the description of sample, variables and the methodology and the measurement instrument will be discussed. In chapter 4, the descriptive results and final result of estimated models analyzed. In chapter 5, conclusion and discussions for further research discussed.

2-THEORETICAL FRAMEWORK

In this chapter, the literatures and theoretical framework on innovation process and firm performance will be reviewed. This part is organized as follows: In section 2.1- Effect of the innovative output on financial performance will be described, in section 2.2- Effect of the innovative input on financial performance will be studied and in the section 2.3 - Moderator role of ownership will be presented. The innovation process itself becomes more and more the topic of this research.

2-1 Effects of the innovation output on the firm's performance

Despite the risk and uncertainty, innovation, when well succeed, may produce a relevant impact on the firm's economic and financial results. Innovation is, thus, a key element for the improvement of firm's performance in particular, and of economies, in general. Recent research confirms that firms are able to use innovation to improve their processes or to differentiate their products and services, presenting a better economic and financial performance than its

competitors, measured both by the market share and profitability and by growth and market capitalization. New goods are at the heart of economic growth. The link between innovation and performance at various levels of aggregation has been the focus of attention in a number of studies in recent decades. The research in this area has resulted in interesting findings regarding expected effects, the data and methods used, and their benefits and limitations. The results, however, are different in many respects, and the successive improvements in our understanding of economic behavior, data quality and econometric techniques call for continued research.

There are empirical studies on the link between innovation and productivity or firm performance by Griliches, 1995; Crepon, Duguet and Mairesse, 1998; Loof and Heshmati, 2000; 2001; van Leeuwen and Klomp, 2001; Kleinknecht and Mohnen, 2002; Criscuolo and Haskel, 2003; Gu and Tang, 2004; and so on.

Kemp et al. (2003) have found a positive relationship between the innovation output (measured by the share of sales from new products in total turnover) and the growth of turnover and employment and no significant with profit. Bloom and Van Reenen (2002) find that the impact of innovation output on the firm performance appears to be contemporaneous when performance is measured by market value but it occurs with a lag when performance is measured by productivity. Bessler and Bittelmeyer (2008) report that innovations bestow on firms only temporary advantage in the short run and their effect appears to be diminishing in the long run. This finding is consistent with Schumpeterian thesis of creative destruction. Innovations provide competitive advantage for a limited period of time after which knowledge is diffused across the market. Based on the different focuses of the researches, it can be concluded that, the relationship of innovation output and firm performance is positive. Loof and Heshmati (2001) examined the relationship between innovation output and firm performance using different data sets. The results are different in some countries, for example the innovation output is significantly and positively related with the firm performance in Norway and Sweden, but not in Finland.

The overall conclusion from the literature is that sales from new products is the most robust measure of innovation output as it includes the entire innovation process (Kemp, et al., 2003).

2-2 Effect of the innovative input on the firm performance

Studies from the early period of research on innovation have typically reported a positive relationship between innovation input and higher firm performance in the following years. Most of these studies used innovation expenditure as the principal measure of innovation at the firm level. Using cross-sectional data for US firms between 1972 and 1977 (Griliches, 1986) finds that the higher R&D investment leads to higher rates of productivity growth among firms. Basic research appears to be a more important determinant of productivity than other types of R&D and privately financed R&D expenditure appears to be more effective than those financed by the state. These findings were later confirmed by (Lichtenberg, et al., 1991) who used longitudinal data on US firms between 1972 and 1985. Similar findings have also been reported for other countries. Goto & Suzuki (1989) using a sample of Japanese manufacturing firms in 1982, find that the growth of productivity is positively related to the growth of R&D investment in firm's

core activity and also to the growth of R&D investment in supplying industries. Also, Wakelin (1998) find that for a sample of UK firms between 1988 and 1992, R&D investment had a positive and significant effect on productivity growth. However, it has been suggested in several studies that R&D expenditure suffers from several shortcomings when used as the measure of innovation activity. The Oslo Manual (OECD/Eurostat, 1997) notes that measures of innovation input, although related to technical change, are not its direct measures. It has also been emphasized that the R&D expenditure does not encompass all innovative efforts of firms such as learning by doing or the knowledge embodied in its investment in new machinery and also its human capital.

In a survey of econometric studies of R&D and productivity at the firm level, Mairesse and Sassenou (1991) document widely varying estimates of the contribution of R&D to productivity. The variations are mainly observed across samples and model specifications and in relation to different estimation methods. The survey is based on 18 econometric studies at the firm level in the United States, France and Japan between 1969 and 1988. In a promising innovation model recently developed by Crépon *et al.* (1998), a four-equation knowledge production function model was introduced, which includes three relationships: the productivity equation relating innovation output to productivity, the knowledge production function relating investment in research to innovation output and the research investment equation linking research to its determinants. An additional equation concerns investment decisions.

The conclusion of above mentioned literature led to this point that, higher investment on R& D will be led to better firm's performance in very near future but not very bold in a short run and somewhat by passing time in forthcoming years the results will be more tangible.

2-3 Moderator role of ownership

Ownership concentration negatively affects the probability of innovation, especially by reducing firms' R&D effort. The risk aversion induced by lack of financial or industrial diversification is a source of large shareholders reluctance to innovate (Raoul Minetti and Pierluigi Murro, 2002). Moreover, conflicts of interest between large and minority shareholders appear to reinforce the negative effect of ownership concentration on innovation. Firm's governance may play a crucial role in firm's ability to advance their technological frontier. Innovators, due perhaps to their market position, are able to protect their new products from the competition which normally erodes such profits, or because innovating firms are able to introduce multiple innovations over time, and are therefore able to maintain high profits although the profit effect of any individual innovation may be transitory.

Jensen and Meckling (1976) shows that large shareholders have more incentives to collect information and monitor firm's management, thereby mitigating managers free riding. Shleifer and Vishny (1997) add that when control rights are concentrated in the hands of a small number of investors with a large cash flow stake, such investors can more easily coordinate their actions. Firms led by a family appear to be more prone to innovation than firms led by financial institutions. However, the benefits of ownership by financial institutions for innovation increase with their equity stake. Concentrated ownership may be detrimental to firm performance because excessive control stifles managerial incentives to acquire information in situations of uncertainty

(Aghion and Tirole, 1997) or because it results into insufficient liquidity of the shares of the company or inadequate informational content of stock prices (Holmstrom and Tirole, 1983).

By distinguishing across types of shareholders, it was uncovered some evidence that families support innovation more than financial institutions, but that the benefits of financial institutions for technological change increase with their equity stakes. Promoting innovation allows firms to diversify the risk of innovation across a large number of investors (Aghion, Van Reenen, and Zingales, 2009). By contrary, in recent years several policymakers have expressed concerns that family-oriented businesses, such as those typical of some European and East Asian countries, might be less prone to technological change. For example, families could be reluctant to abandon their traditional core business and venture into risky new activities. Bolton and von Thadden (1998) stress the benefits of ownership dispersion, such as larger market liquidity and better risk diversification. These two different views on the effect of ownership concentration are not necessarily in contrast with each other because they may apply to different contexts. In the case of the United States, where ownership is widely dispersed, and managerial agency problems might undermine firm's performance. In this context, the benefits of ownership concentration could outweigh its costs (in accordance with the Jensen and Meckling's view). By contrast, in Europe and East Asia, where ownership is highly concentrated and large shareholders may pursue their own interests at the expense of other stakeholders, the negative effects of ownership concentration might outweigh the incentive benefits.

Crepon, Duguet and Mairesse (1998) studied the links between research, innovation input and productivity using French manufacturing firms. Their results showed that the probability of participating in innovation process.. Ownership concentration negatively affects the probability of innovation, especially by reducing firm's R&D effort. The risk aversion induced by lack of financial or industrial diversification is a source of large shareholders reluctance to innovate. Moreover, conflicts of interest between large and minority shareholders appear to reinforce the negative effect of ownership concentration on innovation. Cohen and Klepper (1996) introduce facts about the relationship between firm size, innovation and the probability of innovation, especially by reducing firms R&D effort. The probability of a firm undertaking innovation increases with firm size. The risk aversion induced by lack of financial or industrial diversification is a source of large shareholders reluctance to innovate. Moreover, conflicts of interest between large and minority shareholders appear to reinforce the negative effect of ownership concentration on innovation. Jensen and Meckling (1976) shows that large shareholders have more incentives to collect information and monitor firm's management, thereby mitigating managers free riding. Shleifer and Vishny (1997) add that when control rights are concentrated in the hands of a small number of investors with a large cash flow stake, such investors can more easily coordinate their actions. Firms led by a family appear to be more prone to innovation than firms led by financial institutions. However, the benefits of ownership by financial institutions for innovation increase with their equity stake. Concentrated ownership may be detrimental to firm performance because excessive control stifles managerial incentives to acquire information in situations of uncertainty (Aghion and Tirole, 1997) or because it results into insufficient liquidity of the shares of the company or inadequate informational content of stock prices (Holmstrom and Tirole, 1983).

3- DATA & METHODOLOGY

3-1 Data & Sample

The quantitative analysis is based on innovation survey data from the Kauffman Firm Survey (KFS). The data was created out of “kfs6_publicuse_17mar11” which is up to year 2011 but regarding our cases and limitation, the data filtered to final model data set with 132 variables and 4,928 observations. The panel of businesses was created by using a random sample from Dun & Bradstreet’s (D&B) database list of new businesses started in 2004, which totaled roughly two hundred fifty-thousand such businesses. The KFS oversampled these businesses based on the intensity of research and development employment in the businesses primary industries. The KFS sought to create a panel that included new businesses founded by a person or team of people, purchases of existing businesses by a new ownership team, and purchases of franchises and D&B records for businesses that were wholly owned subsidiaries of existing businesses, businesses inherited from someone else, and not-for-profit organizations. Also, previous research on new businesses has reported variability in how business founders perceive when their businesses started operations. Therefore, a series of questions were asked of business owners about indicators of business activity and whether these were conducted for the first time in the reference year (2004). A random sample of 32,469 businesses was released for data collection on the baseline survey, conducted between July 2004 and July 2011. A total of 17,258 businesses were screened for eligibility, resulting in the identification of 6,030 eligible businesses (a 35% eligibility rate). Interviews were completed with principals of 4,928 businesses that started operations in 2004, which translates to a 43% weighted response rate. A self-administered Web survey and Computer Assisted Telephone Interviewing (CATI) were used for data collection, and KFS respondents were paid \$50 to complete the interview. CATI completes accounted for 3,781 (77%) and Web completes accounted for 1,147 (23%) of the total interviews. The results across sampling strata show that 2,034 interviews were completed in the two high-technology strata. The remaining 2,894 interviews were completed among non-high-tech businesses.

At the beginning step, the data was checked and reviewed precisely. The missing values in the dataset analyzed and removed from the data set. A first set of models are estimated to test how the innovation outputs affect the firm’s performance, the main independent variables considered as: Copyrights, Trademarks sand Patents as the innovation output variables which are available only till year 2006 and data is lagged and no more data for innovation outputs is available after year 2006. Other set of models tried to estimate how innovation input affects the firm’s performance and the total expenditure on R&D is regarded as the independent variable which is available till year 2007, due to the fact that data is lagged and no more variable is available for innovation input. Finally, in the last models, the moderator role of ownership as ownership concentration tested with the assistance of some control variables as firm size, SBA assistance, federal assistance, ownership concentrations index and Age of owner.

3-2 Dependent Variables

The dependent variable is total profits and total loss of the firms on year 2007 with the range of values (-9 to 9) which negative values belongs to losses and positive values refer to profits which presented in the following table:

Value	Category	Cases
-9	\$1,000,001 or more	18
-8	\$100,001 to \$1,000,000	97
-7	\$25,001 to \$100,000	197
-6	\$10,001 to \$25,000	198
-5	\$5,001 to \$10,000	165
-4	\$3,001 to \$5,000	135
-3	\$1,001 to \$3,000	147
-2	\$501 to \$1,000	67
-1	\$500 or less	102
0	-----	418
1	\$500 or less	111
2	\$501 to \$1,000	90
3	\$1,001 to \$3,000	181
4	\$3,001 to \$5,000	155
5	\$5,001 to \$10,000	245
6	\$10,001 to \$25,000	350
7	\$25,001 to \$100,000	430
8	\$100,001 to \$1,000,000	93
9	\$1,000,001 or more	8

In this research, the expected effects of the innovative outputs on financial performance of the firms, regarded in the next years (2007, 8) as well, to see how firm's performance will be affected by the whole innovation process that constructed in the previous year (2006) .That could be the reason why the innovation process is a risky action, because its results and outcome cannot be manifested and revealed in the current time of innovation process. It always needs time to show its effect on the performance of the firm.

3- Independent Variables

The descriptive for independent variables regarded for innovation outputs (2006) organized as follows:

Variable	Obs	Mean	Std. Dev.	Min	Max
Patents	3396	0.1766784	1.549953	0	50
Copyrights	3366	1.64795	13.89513	0	250
Trademark	3345	0.2813154	1.037324	0	15

Independent variables:

Three measures of Innovation output are introduced, patents, copyrights and trademarks. **Patents** (*PATENT*), in compare with the previous years shows remarkable reduction and may bring this matter to mind that the firms who invested on patents were not satisfied with the outcome and its effect and lost they trust on this process and did not invest on it anymore in the next coming years. The maximum patents by firms listed as 50 and minimum is listed as 0 and as it showed the mean is very low. The **Copyrights** (*COPYRIGHT*) shows decrease in the numbers of companies with capabilities of making copyrights, but in this case it is important to see that maximum number of copyrights listed as 250 which shows the importance of copyrights than the others innovation outputs (trademarks and patents). It is also important to say that the mean is remarkable higher in compare with the others and can be concluded that copy rights has more priority than others among firms. **Trademarks** (*TRADEMARK*) have the same situation as patents and we can see decline of number of firms with capabilities to produce trademarks, it was compared with the previous years and the max shows that it can be ranked as third in the priority of innovation process among firms.

Another independent variables used in model 4,5 and 6, is innovation input (R& D expenditure) ranged from (0-9) as follows and contains 2912 observations with mean 0.874 and std 2.10 :

Value	Category	Cases
0	0	2401
1	\$500 or less	39
2	\$501 to \$1,000	40
3	\$1,001 to \$3,000	64
4	\$3,001 to \$5,000	65
5	\$5,001 to \$10,000	73
6	\$10,001 to \$25,000	72
7	\$25,001 to \$100,000	97
8	\$100,001 to \$1,000,000	49
9	\$1,000,001 or more	12

Ownership concentration (OC) which is similar to Herfindal index as a measure of market concentration, refers to the amount of stock owned by individual investors and large-block shareholders (investors that hold at least 5 per cent of equity ownership within the firm) range from 0 to 100 %.Owners with significant amount of shares may take aggressive actions, either directly or indirectly, over firm decisions such as the election of board members and replacement of CEO or poor management with their voting power. As such, ownership concentration can be an internal governance mechanism that helps reduce the likelihood of managerial opportunism because managers and boards of directors are more likely to take into account the preferences and interests of large shareholders. In the case of this study it was created out of the variable “Percentage owned by owner” by Squaring the percentage of ownership of each business and summing the resulting numbers very similar to Herfindal index.

“ **Innovative Output × Ownership “ (I.O.O)**was created as a variable created as : output innovative variables multiple to ownership concentration to assist the model10 with innovation outputs (patents, copyright and trademarks) to test how ownership concentration involved with innovation outputs could effect the firm’s performance.

“Innovative input \times Ownership “(I.I.O) included in the model¹¹ created to help estimating the effects of innovation input engaged with ownership concentration on firm’s performance during the next upcoming years.

3-4 Control Variables

Following the literature introduced different control variables to estimate the models multidimensionality and prevent form simplicity in estimation. Control variables which assisted in this article are listed as:

1- Size (*NEMP*):

The size was measured as Number of employees (*NEMP*). All full- and part-time employees were included, but exclude contract workers who work for the business either full- or part-time but are not on the business official payroll. One of the factors frequently related to the decision to innovate and the innovation input is the size of the firm with the number of employees as the most commonly used measure. As noted in section 2, the theory postulates that under different conditions firm size could be positively or negatively related to innovation. This postulate is supported by a large number of empirical studies which have reported positive, negative or even insignificant relationship between the firm’s size and its decision to innovate or the innovation input decision (Klomp, et al., 2001; Loof, et al., 2002; Kemp, et al., 2003; Loof, I dr., 2006).

2- Age of owner (majority owner) (*AGE*):

These variables were constructed for the question collecting the age of majority owner-operators of the business. The range definitions are provided below:

Value	Category	Cases
1	18-24	32
2	25-34	400
3	35-44	932
4	45-54	866
5	55-64	520
6	65-74	98
7	75+	11

3- Legal status: The values of this variable as listed below:

Value 1: Sole Proprietorship: A type of business ownership in which a business is owned and managed by one individual and no subchapter S-corporation or C-corporation has been established.

Value 2: Limited Liability Company: A cross between a corporation and a partnership, and offering some of the benefits of both. Similar to S corporations, income produced by a limited liability company flows through to owners (known as “members”) who pay their own taxes as individuals. Unlike S-corporations, however, limited liability companies are not subject to as many government restrictions.

Value 3: Subchapter S-Corporation: Corporations in which all profits and losses are passed through to shareholders, just as they are passed through to partners in a partnership.

Value 4: C-Corporation: Legal entities separate from their owners that may engage in business, make contracts, own property, pay taxes, and sue and be sued by others.

Value 5: General Partnership: An association of two or more people who co-own a business for the purpose of making a profit and no subchapter S-corporation or C-corporation has been established.

Value 6: Limited Partnership: A partnership in which one or more partners are general partners who manage the business and others are limited partners who invest in the business but forego any right to manage the company.

Value 7: Others

Value	Category	Cases
1	Sole Proprietorship	813
2	Limited Liability Company	886
3	Subchapter S-Corporation	648
4	C-Corporation	207
5	General Partnership,	63
6	Limited Partnership, or	32
7	Other	5

4 - SBA assistance:

There are many programs available to help new businesses, some possible sources of training and assistance that may have been used to help a business. The regarded question was, has any of the other owners ever received any business training, mentoring, or technical assistance sponsored by The Small Business Administration or SBA? The value given to their response listed as follow:

Value	Category	Cases
0	No	2346
1	Yes	289

The responses show that the majority didn't use this assistance and only 10% used it.

5- Federal government assistance:

One of the programs available to help new businesses is federal government assistance. The question asked in questionnaires was: Have you (or any of the other owners) ever received any business training, mentoring, or technical assistance sponsored by a Federal government agency other than SBA.

Value	Category	Cases
0	No	2538
1	Yes	91

The responses given above showed that only few owners 3.5 % used federal government assistance.

6 - Sector (NAICs code) eight dummy variables were created for each class:

Dummy sector 1. This variable takes value 1 for the firms whose NAICs Code is from 10 to 19, and zero otherwise.
Dummy sector 2, This variable takes value 1 for the firms whose NAICs Code is from 20 to 29, and zero otherwise.
Dummy sector 3, This variable takes value 1 for the firms whose NAICs Code is from 30 to 39, and zero otherwise.
-Dummy sector 4, This variable takes value 1 for the firms whose NAICs Code is from 40 to 49, and zero otherwise.
Dummy sector 5, This variable takes value 1 for the firms whose NAICs Code is from 50 to 59, and zero otherwise.
Dummy sector 6, This variable takes value 1 for the firms whose NAICs Code is from 60 to 69, and zero otherwise.
-Dummy sector 7, This variable takes value 1 for the firms whose NAICs Code is from 70 to 79, and zero otherwise.
-Dummy sector 8, This variable takes value 1 for the firms whose NAICs Code is from 80 to 92 (last NAICs code in your sample), and zero otherwise, given the value one whenever the firm is active in a specific industry (SECTOR 0-8).

3-5 Statistical Method and Models

Model 1, 2 and 3:

In the models 1, 2 and 3, the OLS model regarded to test the effects of innovation outputs on the firm's performance the idea is that the positive effect of innovative outputs on financial performance can appear one year after innovation process, but this article as it will be discussed later challenge this idea. Model1 (2006) tested how innovation outputs affect the firm's performance in the same year of creating the innovation outputs. Model2 (2007) tried to check the effect of innovation outputs on performance and to see how it enhances the firm performance in the year 2007 (one year after innovation process).Based on the idea approved by most of the literatures discussed in the section 2, it was expected to see the positive effect of innovation outputs on financial performance of the firm in the years after the innovation process, but unexpectedly you will see the results on the way around. Model3(2008) tried to observe precisely what happened to the firm's performance after passing 2 years of innovation process

and to check if the innovation process was successful or vice versa, which in our case was totally opposite of the expectation and it is really surprising .

Model 4, 5 and 6:

In the model5 tried to check, the effect of innovation input invested and constructed on the year 2006 on the firm's performance and the results shows very different with the expected one. In model5, this process was checked for the year 2007 the year right after the innovation process, but results were not satisfying. It was expected by passing more time, like 2 years after innovation investment, the firms could enhance their performance and could be more successful than the years without innovation but the results showed opposite of this idea. As reviewed in section 2, the whole innovation process will bestow more positive opportunities to firm which can make them capable to compete stronger and better than time without innovation. Investment on innovation process is considered as expenses for the better future. But in this article, results show very different from the results so far discussed and to be honest challenged all the positive view on innovation issue.

Model 7, 8,9,10 and 11:

Respect to regression, because of having 18 values as dependent variable (from -9 to 9) the ordered logistic regression applied as the best method of estimating these models . Initial model applied in this study was OLS but, due to some errors of simplicity of the model and using control variables and 18 independent values, the model changed to ordered logistic regression for better estimation which really worked and assisted a lot. The sign of ownership to the performance analyzed and how the effect of innovative output/input varies when different Ownership concentration index were tested. Additionally 5 model were achieved as followed to check the Moderator effect of ownership:

Model7- Ownership (Herfindal Index) + Control variables
Model 8- Innovative Output + Ownership + Control variables
Model9- Innovative Input + Ownership + Control variables
Model10- Innovative Output + Ownership + Innovative Output x Ownership + Control variables
Model11- Innovative Input + Ownership + Innovative Input x Ownership + Control variables

3-6 Descriptive Statistics

In the table 1, presented the descriptive statistics of the variables that are used in this paper. Regarding to the dependent variable, it is observable that the 36% of the firm's profit that are doing innovation process and developed a product innovation in the year 2006 is reduced to 32% and in the year 2008 is 27%. The percentage of investment in the R&D by firms is the 87%. Regarding innovation output the firms has 17% increase on making patents in the year 2006 and

the copyrights 32% and trademark 29% out of the innovation process. The descriptive statistics show that the firm with number of employee over 29 ,has 75% of the firm involved in the innovation process and for the firm less than 29 employees has 25% contribution on innovation process which it really shows the effect of innovation on the firm's Performance. Finally, it is observable that among the sectors of Naics code, the sec 5 is the biggest sector with 59% and the sec4 with the 17% and sec 3 with 14% are the best sectors that innovation process occurred and help the better performance. Also it can be regarded that ownership concentration is lost locate in ownership concentration index in the year 2007 which could be because of the risk matter and uncertainty.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Performance2006	3313	1.808331	5.359179	-9	9
Performance2007	2799	1.638442	5.562245	-9	9
Performance2008	2476	1.374394	5.614697	-9	9
Copyright 2004	4870	1.024846	7.571851	0	100
Trademarks 2004	4868	.2721857	1.766894	0	99
Patent 2004	4889	0.1898139	2.734421	0	100
Patent 2005	3921	.1917878	2.872183	0	100
Copyrights 2005	3876	1.067595	8.032744	0	100
Trademarks 2005	3877	.3038432	1.973514	0	100
Expenses on R& D	2912	.8746566	2.102268	0	9
Patents 2006	3396	.1766784	1.549953	0	50
Copyrights 2006	3366	1.64795	13.89513	0	250
Trademarks 2006	3345	.2813154	1.037324	0	15
NEMP 2007	2875	2.544	4.395353	0	29
NEMP 2006	3328	2.504808	3.912706	0	24
sec8	4928	.0006088	.0246682	0	1
sec7	4928	.0411932	.1987569	0	1
sec6	4928	.0304383	.1718075	0	1
sec5	4928	.5905032	.4917909	0	1
sec4	4928	.171875	.37731	0	1
sec3	4928	.1461039	.3532462	0	1
sec2	4928	.0894886	.2854767	0	1
Legal Status	2971	2.238304	1.143755	1	7
OC	274	.2239049	.3528341	0	2.43076
AGE 2007	2857	3.625131	1.097412	1	7
AGE 2006	3347	3.603824	1.107313	1	7
I.O.O	327	.0602703	.1705771	0	1.450967
I.I.O	359	.0354157	.5532869	0	10.31799

4- RESULTS

Effects of innovation output on firm's performance

Table 2 shows the estimation of Model 1, 2 and 3, by respect to OLS. In these mode dependent variables (firm's performance of the year 2006, 2007 and 2008) accompanied by the independents variables and the assistance of the standard control variables helped to better check how innovation output affects firm's performance. The results are totally different with the aforementioned findings in theory part and the model reveals a totally heterogeneous, which really stands against the most of literature reviews in the 2nd section of this paper as: Griliches, 1995; Crepon, Duguet and Mairesse, 1998; Loof and Heshmati, 2000; 2001; van Leeuwen and Klomp, 2001; Kleinknecht and Mohnen, 2002; Criscuolo and Haskel, 2003; Gu and Tang, 2004; found positive link between innovation outputs and productivity or firm performance in their empirical studies. See the table 2, the results are very miscellaneous in the year 2006 and there is no support for the results of former researches, see the negative and significant coefficients of Patents which shows, it's not related to firm performance positively and even shows that firm's performance will be reduce by 28.5% due to investment and the spent amount money on the innovation process. Patents plays a significant role in the vitality and strength of firms in the current market and economy, due to its advantages like capability of selling it to other firms or licensing. These results really challenge the former results found by mentioned researchers, and bring this idea to the mind that, there are lots of unknown and unfound items woven in this field for working in near future to investigate better this issue. The firm's performance in the next upcoming years (2007, 2008) tested in model 2, and 3, but the results was not favorable at all and coefficient shows again very different and even by passing 2 years after investment on the Trademarks production, still the firm's performance is reducing and this reducing is more than the year 2006 by 43.7%. The year 2008 estimated as well in model 3 and it is observable that the situation is the same as 2 passed years and there is no relation between Patents innovation and the better firm's performance and it keeps reducing the performance by 35.8%, which would be interesting to analyze what caused these situation in the future studies?

In the case of copyrights the situation is very different with 2 other innovation outputs (Patents and Trademarks). In this case, the coefficient of trademarks and patents are negative but, significant and for copyrights the coefficient is positive but not significant in the years (2006 and 2007) which express this fact that copyrights due to its massive difficulties to obtain, is a very time and money consuming for short run target and do not affect the firm's performance for better success in the market and better position in the future. Maybe its effect will be showing on long term rather than short term which could be another subject to be investigated. But In the year 2008 the result shows a bit change and brings to mind this idea that after 2 years passed it starts to assist with better firm's performance. It would be perfect if the firm's performance could be analyzed by upcoming years after 2008 like (2009, 2010 ...), but as mentioned already the data is not available in this case.

For trademarks, the coefficients show significant but negative for years 2006, 2007 and in the year 2008 no significant at all, but reduced a bit which can be conclude that the loss will be lower by passing longer times. It is observable that this situation can lead to this point that the

better performance will be achievable by passing more times. Finally, in this case exposed that trademarks do not affect the firm's performance for better, and even reduced it for the year 2006 to 26.5%, year 2007 25.2 % and year 2008 to 23.1% which very fluctuating during these mentioned Years.

Table 3, presented results of model 4, 5 and 6 which reveals the effect of innovation input on firm's performance. The coefficient for year 2007 reduces the performance by 16.1 % and this amount for the year 2007 will be 17.8 %. For the year 2008 is 25.3 % which is a very tiny changes and shows no big variations since last year. The results can be connected to the results found in the article (C. Bayona and T. García 2010), which stated that the buy strategy would produce the lowest impact on the firm's innovative performance. The make strategy has also positive and significant effects, but smaller than those for the make-buy strategy. Based on the idea that innovation process will be causing better performance here is not working and only shows that spending money on innovation process will be considered as expenses. It is necessary to mention that innovation process is not the project that could affect in the short run and needs longer period to show its positive signs. In another view, it can be concluded that solely, make strategy won't work in the current close markets and producing innovation outputs, it is not the good idea for success of the firms in the competitive markets due to the cost and time limitations.

Table 4, reveals the results of the Moderator effect of ownership which is in line with the theoretical part section 2-3 and shows that Ownership concentration negatively affects the performance and innovation process, especially by reducing firm's R&D effort. Results indicate that, the greater the size and technological knowledge, the lower the probability of realizing process innovations. The results in Table 4 show that the effects of firm size, sectors (Naics code), legal status, SBA assistance, Federal Assistance and number of owners has negative effects on firm's performance and shows no significant relation with firm's performance. The assumption that firm diversification increases product innovations, since it helps to spread the risk assumed when innovations are achieved (Cabagnols and Le Bas, 2002), holds only for high-technology firms. Especially remarkable is the negative and significant coefficient obtained for size of the firms, indicating that the more diversified a firm is, the lower the number of product innovations. In order to obtain robust results, the models presented in Table 4, considering product innovation with a diversified characters. This converse effect of the control variables on firm's performance challenge all assumptions of significance relation of ownership moderator role on firm's performance for the entire sample.

The results can lead us to this point that ,the risk aversion induced by lack of financial or industrial diversification is a source of large shareholders' reluctance to innovate, and could be the reason that ownership concentration is not significantly related to firm performance and even showed that it will reduce the firm performance in the year 2007 by 23.8% and this ratio show an increase in other models as in model 8 to 29.6 % and in the model 9 to 35.3%, model 10 shows 29.6% which is a sign of decreased in the level of loss in firm's performance. The last model showed the 32.2% and this fluctuation doesn't seem to be normal.

Table 2: Estimation the effects of innovation outputs on the firm's performance

	(1) Perfromance2006	(2) Perfromance2007	(3) Perfromance2008
PATENT 2006	-0.285*** (0.0632)	-0.437*** (0.0850)	-0.358*** (0.0968)
COPYRIGHT 2006	0.000000771 (0.00661)	0.00118 (0.00781)	-0.0176* (0.00812)
TRADEMARK 2006	-0.265** (0.0939)	-0.252* (0.112)	-0.231 (0.122)
sec8	2.676 (3.043)	3.819 (3.153)	4.042 (3.175)
sec7	-0.996 (0.545)	-1.712** (0.636)	-1.597* (0.685)
sec6	0.460 (0.570)	1.016 (0.688)	1.649* (0.733)
sec5	-0.0569 (1.760)	2.220 (2.067)	-0.384 (2.248)
sec4	-0.987 (1.773)	1.192 (2.081)	-1.188 (2.264)
sec3	-1.014 (1.775)	1.620 (2.082)	-0.784 (2.265)
sec2	-0.0221 (1.784)	1.859 (2.094)	-0.726 (2.277)
LEGAL SATUS 2006	-0.143 (0.0842)		
AGE 2006	-0.0981 (0.0862)		
LEGAL SATUS 2007		0.0168 (0.100)	
AGE 2007		-0.0933 (0.102)	
LEGAL SATUS 2008			-0.0211 (0.111)
AGE2008			-0.0204 (0.111)
_cons	3.013 (1.796)	0.306 (2.110)	2.464 (2.299)
N	3077	2420	2129
R-sq	0.024	0.028	0.023
adj. R-sq	0.020	0.023	0.017
rmse	5.265	5.453	5.491

Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Table 3: Estimation the effects of innovation input on the firm's performance

	(1) Perfromance2006	(2) Perfromance2007	(3) Perfromance2008
Expenditure (R&D) (2007)	-0.161** (0.0511)	-0.178*** (0.0524)	-0.253*** (0.0593)
sec8	2.533 (3.047)	3.878 (3.190)	4.001 (3.202)
sec7	-1.356* (0.570)	-1.947*** (0.566)	-2.121*** (0.625)
sec6	0.838 (0.641)	1.209 (0.671)	1.739* (0.757)
sec5	-0.000624 (0.367)	0.307 (0.385)	0.293 (0.423)
sec4	-0.781 (0.432)	-0.676 (0.447)	-0.512 (0.498)
sec3	-1.026* (0.440)	-0.407 (0.457)	-0.356 (0.508)
LegalStatus2006	-0.157 (0.0920)		
AGE 2006	-0.133 (0.0940)		
Legal Status 2007		-0.0317 (0.0955)	
AGE 2007		-0.134 (0.0971)	
Legal Status 2008			-0.0594 (0.109)
AGE 2008			-0.0458 (0.109)
_cons	3.264*** (0.507)	2.403*** (0.533)	1.988*** (0.601)
N	2618	2704	2211
R-sq	0.018	0.017	0.023
adj. R-sq	0.015	0.014	0.019
rmse	5.271	5.519	5.538

Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Table 4: Estimation of the Moderator effect of ownership

	(7)	(8)	(9)	(10)	(11)
	Perfromance2007	Performance 2007	Performance 2007	Performance 2007	Performance 2007
OC	-1.837 (2.617)	-1.207 (2.807)	-2.186 (2.559)	-1.340 (2.843)	-2.222 (2.900)
sec8	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
sec7	0.572 (2.555)	0.552 (2.632)	-0.280 (2.518)	0.599 (2.683)	0.590 (2.742)
sec6	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
sec5	-2.399 (2.520)	-1.738 (2.483)	-1.797 (2.472)	-1.778 (2.512)	-1.718 (2.564)
sec4	0.433 (3.200)	0.407 (3.115)	0.252 (3.126)	0.374 (3.152)	0.186 (3.208)
sec3	-2.567 (2.600)	-0.874 (2.634)	-0.699 (2.644)	-0.519 (2.689)	-0.504 (2.810)
Legal status	-1.400* (0.614)	-0.782 (0.718)	-1.114 (0.610)	-0.766 (0.733)	-1.048 (0.713)
AGE	0.445 (0.609)	0.467 (0.645)	0.354 (0.596)	0.419 (0.663)	0.438 (0.673)
SBA	-0.689 (1.942)	-0.701 (2.076)	-0.989 (1.901)	-0.929 (2.114)	-1.080 (2.186)
Federal	-1.395 (2.455)	-2.444 (3.036)	-1.246 (2.398)	-2.210 (3.092)	-2.666 (3.136)
Patent		-0.346* (0.169)		-0.311 (0.176)	
Copyrights		0.00949 (0.0295)		0.00792 (0.0299)	
Trademarks		-1.157* (0.494)		-1.087* (0.545)	
Expenditure on R&D			-0.500* (0.198)		-0.449 (0.238)
IOO				-3.662 (5.833)	
IIO					-1.783 (3.724)
cons	4.474 (3.641)	2.981 (3.777)	4.431 (3.555)	3.208 (3.859)	4.007 (3.886)
N	120	104	120	102	102
R-sq	0.088	0.170	0.138	0.169	0.118
adj. R-sq	0.013	0.061	0.059	0.046	0.010
rmse	6.480	6.287	6.328	6.353	6.470

Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

5- CONCLUSION

The results obtained show that innovation had a negative impact on the economic and financial performance of the included firms. It should also be stressed that the study of the relationship between innovation and economic and financial performance is currently a much discussed subject and extremely important for most of the firms and national economies. Nevertheless, it remains much to be discovered in this specific research area that how possibly positive results found in former articles, was challenged in this paper with KFS data set. As far as the dynamic component of the innovation process is concerned, identification of the factors that influence each of its different phases can never be considered complete. The conclusions reached in this research allow suggesting some corporate practices that are part of innovation systems and that can become responsible for fostering innovation at an entrepreneurial level to test this issue more precisely in complete manner.

Several econometric models have been presented to test the relationship between innovative input, innovative output and ownership concentration on firm performance. Most variables that are significantly explaining innovative output are corresponding between small and medium-sized firms. The most interesting difference is the negative effect of copyrights, trademarks & patents on the firms. For innovation input also, there is no significant effect which surprised the whole article and bring this idea to mind that if investing on innovation could not assist the better future for the firms in the competitive and close market, what else can do it? The Relationship between innovative output and firm performance is tested by control variables in diversified model but the result was heterogonous. Firm's performance measured by 11 different models and revealed that unexpectedly the impact of innovation process on firm's performance is negative and surprisingly moderator role of ownership concentration is playing a role in shadow in this case. The results found in this a paper challenging all the aforementioned researches which was done so far. The most major limitation is that we haven't data about profit and losses synchronized with the subject and the data as explained was lagged. This is an important limitation of this work.

In the same line, another point of interest will be the execution of the same analysis on the moderator role of ownership on firm's performance by regarding the complete and full data, after the year 2004 to the further years to see how current economic world and global trade , twisted with the creativity and innovations advantages. The lagged data maybe caused some errors or strange results. Using the available panel data as the statistical method in the future it will involve the cross-sectional dimension and also a time series dimension. It is more useful for the researcher because it gives a more accurate inference of model parameters and more important, it has greater capacity for capturing the complexity of innovation output/input than a single cross-section or time series data.

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