The impact of stock-options on the company's financial performance

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Abstract
During the last decade, the development of stock-options as a compensation tools, let us ask about their effects on firms, especially on the financial performance and cash flows. Our study is based on a sample that covers the companies listed on SBF 250 in a period from 2006 to 2011, with a total of 504 observations. In fact, our research methodology is to test our model on two panels, panel A based on operating results (OPINC) and panel B referring to cash flows (CFO). Also, we incorporate a dummy variable which is the number of stock-options "NB" in the model to achieve our paper's object .Thanks to the model of Aboody, Johnson and Kasznik (2010); we concluded a positive relationship between the number of stock-options and the financial performance of publicly traded companies. Moreover, we found an absence of the impact of the repricing on future business performance. These results were consistent with the study by Carter and Lynch (2004). But this coefficient was significative and positive related to cash-flows, which has been affirmed by Honlon et al (2003).

I. Introduction

The human resource has been defined as a non-substitutable valuable source that is compensated by remuneration (Deyer and Shafer (1999)). It means that this resource is very precious and the firms try to protect it by doing the formations and encourage it by the different form of wages. Indeed, the motivation of this resource is a psychological process that has an orientation and maintaining behavior in associating the couple "remuneration-productivity". Moreover, it appeared with the work chain Taylor (1911) and the resulting of the bad treatment of human' competences. This working way is characterized by the slowdown of workers productivity that has been generated by the bad working-methods and the increase of wage which was non proportional to the productivity. Then, in 1940, Elton Mayo who discussed the concept of human relationship indicated a correlation between working conditions and workers' productivity and suggested that the group of working was one of form of motivation the workers. In 1954, Maslow found five needs of the employee in his companies, which occurred as follows: psychological needs, safety needs, social needs, esteem needs and the needs to achieve its objectives. Thus, in 1971, Hertzberg developed a theory of enrichment work and describes motivation as the approximation of the content of tasks, success, promotion, independence and autonomy. Furthermore, the motivation of work was a progress, responsibility, nature of work, the recognition and realization of its capabilities. Notably, in 1960, MacGregor determined a theory of X and Y, indicating that the theory of X was the fact that men hate the work, but they are constrained, avoided responsibilities and did not like changes. Unlike the first, Theory Y relates the physical and intellectual effort made naturally. Also, the people who are able to self-control, initiative and creativity. In 1964, another theory Vroom took place which made interaction between employees and the company account and she is interested in the perception of self, confidence and prediction. This theory indicated that job satisfaction was a real value of the people. Hence, a long history between compensation and employee motivation manifested by an appearance and incentive mechanisms for employees to work more by producing more profitability. In addition, these mechanisms affected the control system management, the audit process, participation in decision-making, ownership and compensation formula.

Thus, several researches are interested by the relationship between remuneration and the companies' performance, such as: Jensen and Murphy (1990) and Mehran (1995). Also, Yermark (1995) and Murphy (1998) identified a weak relationship between pay and performance of firms 'managers. But, Gomez (1994) denied the correlation between executive compensation and market performance. Based on all these researchers, we are focused on the forms of remunerations among these we have chosen at this case "the stock option". These tools have been granted by a company to an employee or to an officer for becoming a shareholder (Hirigoryen and Poulain-Rehm (2000)). Indeed, Bolton, Scheinkman and Xiong (2006) found that these contracts improved performance in the short term. However, Poulain-Rehm (2000) noted the absence of the relationship between performance and stock-options. Moreover, Morck et al (1988) suggested that stock-options allowed mitigation of conflicts of interest, which made as a result the improvement of business performance (Pound 1988). All these differences in theoretical literature lead us seeking the relationship between the tools of stock-options and the financial performance of the company in recent years.

Notably, many studies analyzed the relationship between stock-options and performance based on the Black-Scholes formula. Although this model allowed us estimating the volatility of the underlying asset as a function of the option's price but it had many disadvantages such as:

The Black & Sholes formula tends systematically to underestimate or overestimate the price of derivatives. Thus indicates the non constancy of volatility. Also, this model assumes that stocks move randomly (Brownian motion). This random walk means that a specific time, the price of the underlying stock can rise or fall with the same probability. This is generally not true because market movements are affected by many economic factors which cannot be assigned the same probability. In addition, the model uses the risk-free rate to estimate the value of stock-option. In the reality, these rates may change during increased volatility.

All these limits let us not choose the Black-Scholes model to predict our model. Therefore, we will treat the relationship between performance and remuneration by simply using the number of stock-options granted by the company and has been taken from reference reports of companies belonging to the SBF 250 index.
Therefore, our research question is as follows:

• What is the impact of number of stock options granted by firms on the financial performance of listed companies?

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II. Theoretical study on the relationship between stock option and performance companies

II.I. The stock-options

Among many forms of remuneration, we note fundamentally the direct compensation. This compensation includes base salary and irreversible individual parts increases that vary from to a company to another. Also, other form of direct compensation we include the bonus that comes as an amount granted to employees following an evaluation of performance and is the reversible part. Also dependent premiums work organization, people and function. These bonuses can be collective. We also enumerate other forms of compensation, such as the collective (excluding stock options).

In this paper we are interesting to the tools of stock-options that have been defined by Hirigoyen and Poulain-Rehm (2000), as the rights granted by a company to an employee or an officer there to become a shareholder. We distinguish two types of stock-options: one is the option that requires a transfer of shares between the option holder and society; the other is the purchase option which results an increase in capital and the creation of new shares. Notably, Ferri (2004) cited several features of the distribution of stock-options to employees which are as follows: It improves financial reporting transparency implying an efficiency of capital from shareholders. Also, it makes the transfer of wealth to them with more efficiency.

For not having a dilution of capital, it is beneficial for companies to grant share purchase option plans rather than purchasing options. So, the total number in circulation remains constant despite the exercise of options by managers. Through a technical model, Saly (1994) stated the practice of repricing of stock-options that has been defined as an appropriate reaction to the fall in the price of securities. Moreover, in a weak reaction of the market, firms adopted the repricing to not deflecting the value of reality. For this reason, they rejected the option values corresponding to a favorable market period, in this case, the stock price are able to increase even if the performance was low and the companies would adopt the repricing of their option after a positive performance.

II.II. Notion performance

Previous studies have defined performance as an adjustment between income and expenditure. It is meaning the relationship between exercises 'results and performance. In fact, Jaffe (1974) provided a positive abnormal performance after the purchase and abnormal negative after the sale of the option. Furthermore, the performance is considered as an intersection between the ability to base on a bench market, to adapt, to ensure flexibility and the ability to use the tools to achieve the goals. Also, it has many facets that are the responsibility of the manager, accounting and ethics. In fact, Jallais and Al (1994) determined that performance in four areas:

- Commercial-Objectives: To ensure a good part of the market and a growth rate
- Social objectives: improve working conditions
- Financial Objectives: To achieve a rate of return on capital
- Communication Objectives: to improve the client's image and reputation

II.III. The relationship between stock-options and performance

The relationship between performance and stock-options granted attracted the attention of many researchers like Murphy (1986), Mehran (1995), Hall and Libman (1998), Himmelberg et al (1999), Hermalin and Wallace (2001) and Littner et al (2003). Therefore, Yermak (1997) recommended that these tools would be granted if the business performance was low because the incentives which are affected by stock-options became weaker among the time and negative when the dilution increased (Aboody (1996)). Whereas, the Canadian study showed the positivity of this relationship in the short term but the long-term was non-significant (Carmier et al (1999)). Moreover, this impact positive has been found by Ittner and Lacker (2001) and Sesil, Krumova ,Blasi and Kruse (2002). But, Lambert, Lanen and Larckert (1989) demonstrated a negative relationship between the adoption of stock-options and future profits.

Indeed, Charreaux (1997) and Caby and Herigoyen (2001) documented a positive relationship between employee satisfaction and performance at a long-term. Moreover, the relationship between the repricing and the companies' performance is characterized by a negative sign (Chance and al (2000) and Brenner and al (2000)). Conversely, Carter and Lynch (2004) found that it is not difference between firms that adopt the repricing of their stock-options and others who do not adopt it. They did their tests on a sample of 270 firms for year 1998, 135 companies who have practiced repricing and 135 others have not practiced this policy. Thus, they concluded that this result was due to the negligible effect of losses associated with options underperforming on the wealth of beneficiaries.

III. An empirical study on the impact of stock options on company performance

During the last decade, the development of stock-options as a compensation tools, let us examine their effects on the financial performance of listed companies, as well on cash flows. Hence, the purpose of our research is to

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examine the relationship between the distribution of stock-options and performance of listed companies in SBF250.

Unlike cash flows operating income does not differ in its calculation liquidity operations because it has much monetary income and expenses as products and non-cash charges. So, we choose in this paper to detect the first impact of stock-options on the overall results are calculated based on future performance results of operations. Then, the effect of these tools on treating partial results only monetary transactions are cash flows. Among the researchers who addressed this relationship include, such as Murphy (1986), Mehran (1995), Hall and Libman (1998), Himmelberg et al (1999), Hermalin and Wallace (2001) and Littner et al (2003). Thus, the work of Sisil et al (2002) and Littner et al (2003) highlighted the impact of different financial business returns by incorporating the variable stock-options and without these variables. Due to the inherent divergence of results of this work, we put our first hypothesis is formulated as follows:

Hypothesis 1: the stock-options granted positively affect the financial performance of the company listed on the SBF 250. Regarding the relationship between future performance and current performance, we note the study of Aboody et al (2010) in which states a negative relationship. It means that if the company has a low current performance, it tries by consolidating all of its financial and human potential to recover the lack of profitability. As a result, it generates great future operating results. So, we cite as hypothesis:

Hypothesis 2: There is an inverse relationship between current performance and future performance of listed companies on SBF 250. Although the study of Carter and Lynch (2004) which noted that there was no difference between firms that adopted the repricing of their stock-options and others who did not adopt it, many researches are interested by the relationship between the repricing and its negative performance reported sign such as Chance et al (2000) and Bebchuk and Fried (2004). Hence, our hypothesis is as follows:

Hypothesis 3: There is a negative relationship between the repricing of stock-options and the financial' performances of the companies.

Moreover, the study mentioned by Rogerson (1997) has shown that when officers engage in massive efforts accordingly to good salaries, cash flows of the company increases. So we see a reconciliation of the interests of executives with those of shareholders interests. In other words, if the staffs are satisfied in their work, this time, the cash flows generated by the companies will be more important. Similarly, Sisil et al (2002) and Littner et al (2003) examined the positive relationship between different future financial profits and stock- options. Based on these studies, our hypothesis is formulated as follows:

Hypothesis 4: There is a positive relationship between the number of stock-options and the cash flows of the companies.

According to Aboody et al (2010) who indicated that current cash flows negatively affected future cash flows study. Hence, our hypothesis is formulated as follows:

Hypothesis 5: There is a negative relationship between current cash flows and future cash flows

Furthermore, in the same paper we found a positive relationship between the repricing of stock-options and cash flow, we propose the following hypothesis:

Hypothesis 6: The repricing of stock-options are positively affecting the cash flows

Based on our object, we use the hypothetico-deductive approach which is reasoning from theory to practice and based on the relevance of the case cited from the beginning to explain reality. To solve our problem questions, we adopt a scientific approach starting from the general to the specific. Then we determine a research process that begins with the problem, then the establishment of a theoretical framework and presentation of research assumptions and finally the accuracy of an operating framework that allows as seeing the relevance of our hypothesis already set and their confrontations with reality. In fact, this paper promotes the search for reasons of facts found and highlighted the causes explained by the theory. Now we are in the presence of a positivist paradigm because the choice of a hypothetical-deductive routing requires adherence to this paradigm. The latter is based on the explanation and prediction.

Thanks to their easy access, we use secondary data as a data source in affiliation with a quantitative approach. In fact, these data are collected by others to achieve a target, a designated a specific time and ensures quality of the

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representativeness of our sample methodology. Despite some disadvantages in the use of these data, such as ambiguity, incompleteness or discrepancies between the data and changes in measurement methods and the definitions of variables, we choose our approach based on these secondary data. In order to minimize the risk of the existence of bias and reliability to meet our research object, we detect our data with vigilance.

Notably, we are based on the model of Aboody, Johnson and Kasznik (2010). These researchers adopted a Panel A in which they integrated companies that repriced their stock-options and panel B for companies that not have done this process. These researchers concluded in their papers the effectiveness of stock-options by studying the association between the power of the exercise and non exercise of these tools. They used a sample of companies that have repriced their options out of the money. When a company chooses to change the prices of its purchase options at current prices by a repricing, the motivations must be restored. They did a first test that examine whether the repricing of stock-options are associated with changes in future operating results. They found that the changes started at the third and fifth year after the process. Then they did a second test, that the performances 'rise that have been generated from the alignment of stakeholders' interests affected the remuneration, this idea is developed in the studies of Hanlon et al (2003) and Ittner et al. (2003). For their third test, they noted that if the repricing of stock-options affected the incentives of the various ranks of employee's effects. They reported that the repricing increased the performance of the company. But, we don't use their research methodologies. It means that we analyzed our models through a data processing panels. Thus, our models presented as follow:

III.I. Proposed Model and definition of variables

$$\Delta OPINC_{t+1,i} = \alpha_1 + \alpha_2 NB_t + \alpha_3 REPRICE_{ti} + \alpha_4 \Delta OPINC_{ti} + \quad (1)$$
$$\alpha_5 MB_{ti} + \alpha_6 ASSETS_{ti} + \varepsilon_{ti}$$

$$\Delta CFO_{t+1,i} = \alpha_1 + \alpha_2 NB_t + \alpha_3 REPRICE_{ti} + \alpha_4 \Delta CFO_{ti} +$$
$$\alpha_5 MB_{ti} + \alpha_6 ASSETS_{ti} + \varepsilon_{ti} \quad (2)$$

Table 1: Variables of the Model and their Definitions	
$\Delta OPINC_{t+\tau,i}$	Operating profit for the year $t+\tau$ decreased operating income in year t, deflated by the market value of year t. Results of operations, including used by Freedman and Jaggi (1992), are more relevant because they reflect the ability of the company to generate a profit by its activity.
$\Delta CFO_{t+\tau,i}$	Cash flows from operating year $t+\tau$ decreased operating income in year t deflated by the value of the capital market in year t ((Freedman and Jaggi, 1992)
REPRICE	This is a dummy variable that equals 1 for companies that have changed, their stock-options 'prices and 0 otherwise
MB	Market to book is a variable that controls the potential effects of business risk and growth opportunities, that is equal to (Market capitalization / book market)
ASSETS	Is a variable that controls the size effects, it is the logarithm of total assets in year t
ΔCFO_{ti}	The operating cash flows during the year t decreased operating income in year t deflated by the market value of equity in year t
$\Delta OPINC_{ti}$	This is the operating profit for the year t decreased operating income in year t deflated by the market value of year t.
NB	Number of stock options granted by the company was took from the annual reports of listed companies on SBF250

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III.II. Sample

Unlike Aboody, Ron Johnson and Kasznik (2010) who built their sample from the database C / R / O / P, our study is based on a sample that covers all companies listed on SBF 250 in a period from 2006 to 2011 , with a total of 504 observations. These researchers chose their sample of firms between 1990 and 1996 and other financial statement data are from Compustat. However, our database is inherent from annual reports of publicly available on the Internet indexed on SBF 250 companies. This choice is determined by the fact that this financial market is highly developed in terms of stock-option and due to lack of data on the U.S. financial market. Our sample is taken from of SBF 250; the index includes the values of the CAC 40 and SBF 120 index and is the most representative sectors of the French economy rating (Picart 2003). In fact, our research methodology is to test our models on two panels, panel A based on operating results ($\Delta OPINC_{ti}$) panel B as cash flows (ΔCFO_{ti}).

Thanks to the study of Jensen and Meckling (1976), we chose 84 companies that are large and are listed in the SBF 250 index. This study found that large firms tend to grant stock-options to their stakeholders more than small firms. In our model, we neglect the effect of $YR_{\gamma i}$ and IND_{Nti}. In the original model $YR_{\gamma i}$ is a variable that controls the specific industry of the firm is equal to 1 if it has an effect industry in year t, 0 otherwise; IND_{Nti} : This is an indicator that equals 1 if the firm belongs to the list companies selected 0 otherwise.

Moreover, these authors have detected the impact of operations 'results, market to book (which controls the potential effects of business risk and growth opportunities) and the size effect on profits. Moreover, we are interested in our study only by the model of Aboody, Johnson, Kasznik (2010) which examine the relationship between the repricing of stock-options and the performance and we neglect the industry effect because it 's not important in response to our assumption. Indeed, they adopted a Panel A in which we test our exogenous variables on the performance and panel B in which we test our exogenous variables on the cash-flow. In fact, we incorporate the number of stock options "NB" in the model of Aboody, Johnson and Kasznik (2010).

III.III. Results and Discussions

Thanks to the use of panel data, we found that the statistic of Fisher F1 have a probability (p = 0.0000), It is inferior to 5%. Thus, we can conclude that the model is heterogeneous. Order to verify whether this heterogeneity is total, we observe the F2 and we found that it is an individual effect. For the first test, we note this assumption:

Ho: No fixed effects
H1: presence of fixed effects

We found F (75.375) = 0.46175 is greater than 0.40. So we can not reject the null hypothesis, there is no fixed effect. Particular, we observe the Haussmann test that has as the assumptions:

Ho: the presence of random effect
H1: presence of fixed effect

Thus, we note that the probability of Haussmann test is 0.0915 which is greater than the 5%, that is to say we cannot reject the hypothesis H0. So, the random effects model is preferred and we select an estimator of generalized least square. Thanks to its stability and efficiency, we chose the stationary test of Im-Pesaran-Chin. Thus, this test is to fill the test disadvantages of Levin and Chu among which, see, and inter interdependence of residues (Hurlin and Mignon 2004). He mentions as null hypothesis that the series are non-stationary against the alternative hypothesis is stationary of a fraction series.We found that P value (values in parentheses) are less than 5%, which means that the variables are stationary.

Furthermore, we find that treating the variables the numbers of stock-options granted by the companies listed on the SBF 250 are significant and positive for N+3 and N+5 for the panel A. This indicates that following the increase in the number of stock-options granted by the companies to employees and executives, the endogenous variable performance rises (= the difference in operating results of two years (t and t +1) options deflated by the value market in year t). This result is consistent with the research studies of Defusco et al (1990) that reported a positive relationship between performance and remuneration' tools of firms. Similarly, Ltner et al (2003) reported that the increased number of stock-options improves business performance, which involves searching for managers of their interests in the company generates a good performance with the attenuation of internal control problems such as minimizing conflicts of interest (Morck and al (1988)). So, our first hypothesis is valid

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(Hypothesis 1: distribution of stock options positively affects the financial performance of the company listed on the SBF 250).

Table 2: significativity of panel A' variables

Panel A	$\Delta OPINC_{t+1}$			$\Delta OPINC_{t+3}$			$\Delta OPINC_{t+5}$		
	Coefficient	T student	p-value	Coefficient	T student	p-value	Coefficient	T student	p-value
REPRICE	-0.1375	1.14137	0.2543	-0.0969	-0.77434	0.439	-0.04852	-1.4573	0.145
$\Delta OPINC_t$	-0.511***	-4.878	0.000	-2.843***	-0.5539	0.000	0.097***	3.64	0.003
ASSETS	-0.00360	-0.041	0.966	0.00497	0.05861	0.953	-0.07566	-1.7624	0.078
MB	0.0002***	8.141	0.000	-0.0001	-0.41548	0.678	-0.001***	-16.22	0.000
NB	- 0.998	-0.634	0.526	0.757**	2.48955	0.013	0.443***	5.114	0.000

Indeed, the coefficients of exogenous variable "market to book" are significant and have a positive sign for N +1 and N+5 because p-value is inferior to 0.05, which allows us to see that the increase of stock-options' grant induces a growth opportunity improvement. This result is shown by Rau and Vermalen (1998) companies. Similarly, Fama and French (1992) reported that when the ratio VC / VM is high; the rate of return would be higher. That notes that the company with a powerful growth is characterized by an asymmetry of information that encourages the remuneration development of options 'plans at a long-term. Thus, will converge the officer's interest and the interests of shareholders. So, the existence of a positive relationship between the number of stock -options and the market to book.

Table 3: significativity of panel B' variables

Panel B	ΔCFO_{t+1}			ΔCFO_{t+3}			ΔCFO_{t+5}		
	Coefficient	T student	p-value	Coefficient	T student	p-value	Coefficient	T student	p-value
REPRICE	0.11090**	2.595030	0.009	-0.289897	-1.23315	0.2182	-0.048757	-0.877053	0.3809
ΔCFO_t	-0.753***	-11.7235	0.000	-0.2898***	-4.75339	0.0000	-0.3341***	-3.158450	0.0017
ASSETS	0.019641	0.452046	0.651	-0.008506	-0.20624	0.8367	-0.051188	-0.863503	0.3883
MB	0.957	0.867684	0.386	-0.5.32	-0.50806	0.6117	-0.49**	-2.973046	0.0031
NB	- 0.38	-0.70534	0.48	0.599	1.157	0.2477	0.56***	8.721824	0.0000

In contrast, the coefficients "reprice" are not significant for the model (A panel for t student is less than 2, which tells us that the dummy from the revaluation of options does not affect the performance of the enterprise. This result is appropriate to the study of Carter and Lynch (2004), which rejected the relationship between the revaluation of stock-options and the financial performance of companies. Therefore, our assumption is not *valid (Hypothesis 3: There is a negative relationship between the repricing of stock-options and the financial performance of the companies indexed on SBF250.)*

Notably, many coefficients that determine the relationship between the current performances with the future performances of listed companies have a negative sign, which tells us the inverse relationship between current performance and future performance as mentioned in the study by Aboody et al (2010) who they explained that the company make a good returns actually for recovering the low performances that have in past. Hence, our

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hypothesis is valid *(Hypothesis 2: current performances negatively affect the future performances of listed companies in the SBF 250)*

Based on a panel data regression, we find that the coefficients of current cash flows are negative in the relationship with the future cash flows. This is consistent with findings in the Aboody et al (2010) study. So our assumption is valid (Hypothesis 5: There is a negative relationship between current cash flows and future cash flows). Indeed, we find that the coefficient of the repricing of stock-options (reprice) is significant and positive for N +1 in relation to cash -flows. And this Result is consistent with the study of Aboody et al (2010). As a consequence, our assumption is valid *(Hypothesis 6: The repricing of stock options positively affects cash-flows)*. On Panel B, the coefficient of the number of distributed option is also significant and positive in year t +5 because p-value is less than 5%. However, the positive sign of this coefficient tells us about a positive correlation between the number of distributed options and cash flow generated by the listed companies, which affirms the finding of Honlon et al (2003) who suggested that the rise of cash-flow is a result of the increase in the numbers of stock-options distributed. Hence our assumption is valid (Hypothesis 4: There is a positive relationship between the number of stock-options and the cash flows of the companies.)

Table 4: Global significativity of model

years	Models	Fisher stat	$R^2 ajust$
N+1	$\Delta OPINC_t$	362.8477	0.799402
	ΔCFO_t	29.11468	0.236427
N+3	$\Delta OPINC_t$	183.6986	0.6680
	ΔCFO_t	4.877694	0.04095
N+5	$\Delta OPINC_t$	2.654858	0.017899
	ΔCFO_t	5.479960	0.047019

By analyzing the relationship between operating income and the various independent variables, the overall quality of the empirical model is measured by adjusted R^2 is high. This ratio indicates the numbers of stock-options, and changes in current operating results explain the future performance of listed companies in the SBF 250 index. These results are consistent with the study of Aboody, Johnson and Kasznik (2010). In addition, we mention that the statistical Fisher and adjusted R^2 for models after integration of "NB" degrade over time, indicating that the incentive effect of stock-options dissipates over time and that due to dilution, we propose to divide the employees into groups according to their personality and avoid giving easy enough spots so they can produce more effort.

IV. Conclusion
Many theoretical research that has detected a relationship between pay and performance as Jensen and Murphy (1990), Yermark (1995) and is a conflicting results, to detect the impact of the compensation stock options specifically on performance and future cash flows of companies.

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Thanks to a study panel data, we identified the existence of a positive relationship between the number of stock-options and the financial performance of publicly traded companies French. Also, we found a positive correlation between the number of options distributed and future cash flows of the stock-options. Moreover, we find an absence of the effect of the repricing on future business performance; these results are consistent with the study by Carter and Lynch (2004). But this coefficient is significative and positive related to cash-flow which affirms the finding of Honlon et al (2003).

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