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A Meta-Analysis of the Financial Participation Impact on Firm Performance

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Abstract

The theme of the financial participation and its relationship with firm performance continue to occupy an important place in the academic and professional literature. However, researches take many different perspectives that it is difficult to define a conceptual framework and results are often different questioning their generalization.

In this research we propose a meta-analytic approach in order to evaluate the impact of the employees' financial participation on firm performance. The results demonstrated a significant improvement in the economic and social performance of firms that share their profits with their employees.

Keywords: employee financial participation, firm performance, meta-analysis

1. Introduction

The thorough analysis of the systems of remuneration practiced by the firms in the world makes it possible to note that during the last decades an increasingly high number of them had recourse to systems of collective incentive remuneration, binding the compensation of employees to firm performance.

According to Bryson et al. (2011), 10 to 15% of employees' European countries (Belgium, United Kingdom, Germany) are remunerated in an inciting way. This proportion passes to more than 40% for the Scandinavian countries (Sweden, Finland) and for the United States. According to Saint-Onge et al. (2009), 18% of the Canadian firms resort to a mode of participation in the profits covering more than 50% of the employees. In France, during the year 2010, in the nonagricultural commercial sector, more than 57% of the employees profited from a device of profit-sharing (Amar, 2012).

This development of the employees' financial participation corresponds to a choice of a mode of governance, which in its most completed form gives to employees the same residual right as that of the owners of the firm. It fits within the framework of a resolution strategy of the conflicts between the management, normally defending the interests of the shareholders of the firm, and the employees.

In this framework, Bryson and Freeman (2010) consider that the "original" explanation of the modes of financial participation lies in the alignment of the interests of the firm and its employees in the objective of the maximization of the profits. Delahaie and Diaye (2007) retain two reasons which explain the diffusion of these modes. Initially, a contribution to the protection of the firms from the power rise of the international institutional investors in their capital (the employee ownership and the placement of the financial participation bonuses in equity fund contribute to the stabilization of the firm capital). Then, a partial "mutualisation" of the risks between shareholders and employees conducting to a harmonization of their respective interests.

The agency theory, as developed by Jensen and Meckling (1976), is often put at contribution in order to apprehend the relation between the financial participation and the firm performance. Within the framework of this theory, the management of a firm can use control and variable remuneration to lead the employees to act in the interest of the shareholders i.e. in the direction of the maximization of the value of the firm.

Indeed, the divergence of the interests in an agency relation "shareholders-employees", leads the management, acting on behalf of the shareholders, to develop managerial mechanisms to lead the employees to act in the interest of the owners thus generating costs called "agency costs".

In order to reduce these costs, the manager has two alternatives. First is to control the employees directly in order to prevent their deviating behaviors. Only, the asymmetry of information and the indivisibility of the tasks make difficult this direct supervision which in addition has a too high cost for the firm (Alchian & Demsetz, 1972). The second alternative is to develop aligners like forms of control instead of a direct supervision. The financial participation schemes return within this framework.

On another plan, Mirlees (1976) and Holmström (1979) were among the first to show the relevance of the compensation systems related to the performance, compared to the other systems of remuneration, when the efforts of the employees are imperfectly controlled and when their interests diverge from those of the firm which employs them. These same authors showed the role of this form of incentive compensation to encourage mutual control by the members of the same working group thus allowing the firm to replace the hierarchical control system by a collective mutual monitoring system. Mirlees (1976) and Holmström (1979) also showed that this form of compensation facilitates the harmonization of the interests of the two parties within the firm which are the shareholders and the employees.

This review makes it possible to underline the topicality of this debate. It appeared relevant to us to continue it. Our matter is to carry out a reflection relating to the modes of financial participation and their impact on the performance of the firms and that on the basis of the conclusions established in the world literature that we approached without no a priori.

In a precise way, the purpose of our research is to study the relation between the employees' financial participation and the performance of the firm in environments of various natures. We thus formulate the following key question: is there an impact of the employees' financial participation on firm performance and which is its width?

We lay down ourselves the two following objectives thus:

-To examine the nature of the relation between this mode of financial incentive and the performance of the firms according to the various theoretical grids of reading and within sight of the empirical results established in various contexts.

-To identify in a formal way the possible existence of such a relation.

The reflection carried out in this study is composed of four sections. The first one is reserved for the presentation of the financial participation. The second section wonders about its relationship to the performance of the firm. The analysis of the literature, while mobilizing several theoretical and empirical fields, brings answers as regards justification on the existence of an impact of this type of compensation on firm performance. This section will be used for the formulation of the hypotheses. The third section is reserved for the presentation of the empirical step retained for the validation of the research hypotheses. The fourth section presents the empirical whole of the test results.

2. Mechanisms of the Financial Participation

To share with the employees the profits is a mechanism which the owners of the firms practiced since a long time: Berger and Berger (2000) raise the appearance of the concept and the practice of *gain-sharing* since 1889. Since, many other mechanisms of financial incentive of the employees known under the name of financial participation were born and who accompany those by "traditional" remuneration.

The financial participation "describes any arrangement in virtue of which the employees, or a category of employees, can receive money or very other well having a money value (like shares or options), related to the performance of their firm. It implies the payment (or the potential payment) of rewards which are beyond basic remuneration" (Pendleton et al., 2002). The financial participation of the employees is made up of two main categories of mechanisms: the employee ownership and the profit and gain sharing of the employees.

The first mechanism, the employee stock ownership, implying the division of shares, allots benefit to the employees thanks to their statute as holders of the capital and not as workers. The employee stock ownership is a mechanism of indirect participation of employees in the results of their firm, either by the distribution of dividends, or still by obtaining the profits at the time of the sale of the share by the employee, or finally by the combination of both.

The profit and gain sharing of the employees, the second mechanism of the financial participation, covers the modes which are connected to the role of the worker as an employee within the firm. Commeiras et al. (2002) define it as "an optional remuneration of the economic performance of paid in terms of results, improvement of the productivity, realization of objectives of economic order (quality, safety, the respect of the delivery periods".

The profit-sharing and gain-sharing, that compose the second mechanism, have some differences (Table 1):

-The profit-sharing it is a simple form of share of the profits of the firm by the whole of its employees. It gets to them a variable remuneration, dependant on the benefits or other measure of the firm performance. The limit of this device is that the employees see badly how they can influence it. This type of scheme requires, in order to be an effective management tools for employees implication, to accompany it by a true policy of communication so that they seize the interest of his adoption. Failing this, it would be compared to a mode of pure and simple share of the profits.

-The gain-sharing implies to give to employee the possibility of taking part in the realization of a particular objective and thus, to in general associate him thus with firm. This scheme represents a compensation of the performance of the employees measured in terms of quality (rejection rate, delivery periods), of quantity (production, sale), costs (consumption of matters, cost price), but also in terms of socio-organizational performance (absenteeism, rotation, suggestions). The fundamental characteristic of this type of device, and with the difference of the device of profit-sharing, is that the employees realize the importance of the influence which they have on the level of realization of the objective purpose of the financial participation scheme.

Table 1. Profit-sharing vs. Gain-sharing

Dimensions	Profit-sharing	Gain-sharing
Objet of the scheme	Firm	Unit
Mesures	Financial measures which are out of employees influences	Operating results measures that employees can influence
Bonus	Percentage calculated on the basis of elements submitted by financial accounting	A gap between the achievements and forecasts
Bonus distribution forms	Uniform – Proportional – Different	
Frequency of payments	Annually	Frequently
Management bonuses	Immediately Available – Deposited into mutual fund	
Scheme philosophy	No change in employee-management relationship.	Formal means of communication between employees and management and between work groups.

3. Review of the Literature and Formulation of the Hypotheses

For Milkovich and Newman (2008), the schemes of financial participation continue to have popularity because they are in relation to what firm seeks to reach through its strategy of human resources: its own performance through the performance of its employees.

Several measurements of an economic nature were retained in of empirical works on the profit-sharing and gain-sharing impact:

- The productivity: Studies compare either the productivity of the firms having devices of incentive compensation compared to that of the firms without such devices (Kato et al., 2010), or the productivity before and after their introduction (Fakhfakh & Pérotin, 2000). From the whole of these studies a conclusion emerges which is that of a positive impact on the productivity.

- Profitability: Studies retaining the profitability of the assets and the earnings before interest and taxes (Piekkola, 2005) or the return on equity (Guery, 2009) as measures of economic performance confirm the positive impact of profit-sharing and gain-sharing on the performance of the firms.

- The sales: The results of Vaughan-Whitehead (1992) and Wattanasupachoke (2009) studies show that these schemes present a significant positive impact on the growth of the sales.

To final, the whole of these elements lead us to formulate the following hypothesis:

Hypothesis 1: The employees' profit and gain sharing are positively related to the firm economic performance.

In addition, other authors were interested in the social impact of the profit-sharing and the gain-sharing of employees regarding it as a social lever in favor of the amplification of the economic performance of the firm.

Indeed, this mechanism which pushes the employees to become aware of the bond which exists between their effort and the performance of their firm deeply modifies their behaviors (absenteeism, turnover, social climate) but also their attitudes (motivation, satisfaction, implication):

- The motivation: The results of Vaughan Whitehead (1992) and Blasi et al. (2010) show the capacity of these schemes to boost the employees' motivation.
- The satisfaction: Kruse et al. (2008) and Pouliakas and Thoedossiou (2009) conclude that the gain-sharing devices present, compared to the individual incentives, a significantly positive impact on "intrinsic satisfaction in work".
- The implication: Florkowski and Schuster (1992) and Coyle-Shapiro et al. (2002) show that the firms can reinforce the implication of their employees through the devices of sharing of the profits.
- The absenteeism: The financial profit-sharing makes it possible to improve the employees' presenteeism within the firm (Pouliakas & Theodoropoulos, 2009).
- The bearing of the personnel: The profit-sharing can be used as effective means for the stability of employment. The studies undertaken by Azfar and Danninger (2001) and Bellmann and Möller (2010) on the starting rate following the introduction of the financial profit-sharing post results confirming a fall of this rate.
- Social climate: The test results of Kim (2005) show a fall of the rates of strikes and shares disciplinary following the adoption of such modes.

The whole of these developments allows the following hypothesis:

Hypothesis 2: The employees' profit and gain sharing are positively related to the firm social performance.

4. Methodological Framework

We employ meta-analysis in order to test the two research hypotheses. Within the framework of this approach, we follow a well defined process which calls upon a statistical whole of methods of analysis. These is a process which makes it possible to lead a quantitative analysis of the literature leading to reliable results on the level statistical and making it possible to draw a rigorous and exhaustive synthesis from it (Knell & Smith, 1979).

In a research, using meta-analysis as a statistical mode of treatment in the empirical phase represents a rigorous alternative to investigation, to databases or to experimentation. It offers a standardized and reproducible methodology (Laroche & Schmidt, 2004). Its interest, in addition to the work of synthesis, is to increase the precision of the final quantification, its representativeness and its generalization and of raising the doubts in the event of discordances between researches previously completed.

The steps that we followed are those in the procedure of Stanley and Jarrell (1989):

4.1 Step 1: The Definition of the Concepts

The objective of this research is to measure the impact of the employees' financial participation (profit-sharing and gain-sharing) on firm performance (economic performance and social performance). The two variables of interest are thus the employees' financial participation and the firm performance.

4.2 Step 2: Collection, Selection and the Coding of the Studies

In meta-analysis, the stage of collection of the studies is similar to the stage of investigation in a traditional research. The objective of this stage is to obtain the information necessary for the constitution of database which will be used to validate (or not) the defined conceptual framework. In meta-analysis, the principle of exhaustiveness confers on this stage a characteristic, that to integrate all the literature carried out on the subject. An exhaustive research implies all works independently of their results (which they are identical or contrary to the awaited results) and of their publication or not in reviews (Hunter & Schmidt, 2004).

In order to constitute this corpus, we conduct a meticulous and exhaustive search for all existing studies while resorting at the same time to computerized databases (jstor, ebscho, sciencesdirects, ssrn, proquest), to electronic editions of specialized journals in editors' sites (blackwell, econpapers, elsvier, emeraldinsight ideas and spinger) and to search engines (google scholar). We also enriched research while carrying out a manual examination by the notes and the references in studies treating with the subject of our research. All the academic publications dealing with the relation between the employees' financial participation and the firm performance, materialized by a statistical measurement were retained, without any limitation of date. We stopped the collection of the research tasks at the end of April 2013. With final, we could collect more than 565 studies.

Within the framework of the selection, it should be noted that one of the advantages of meta-analysis, unlike a

singular study, is to obtain an estimate of the effect starting from a broader and diversified population. To reach such a result, the choice should not be too selective, in order to preserve the principle of exhaustiveness.

The base that we obtained will undergo a whole of restrictions justifying the elimination of some of the collected studies. Figure 1 recalls the process of identification and selection of the studies which led to the constitution of the empirical database. Following the various stages of the selection, we retained 83 empirical studies.

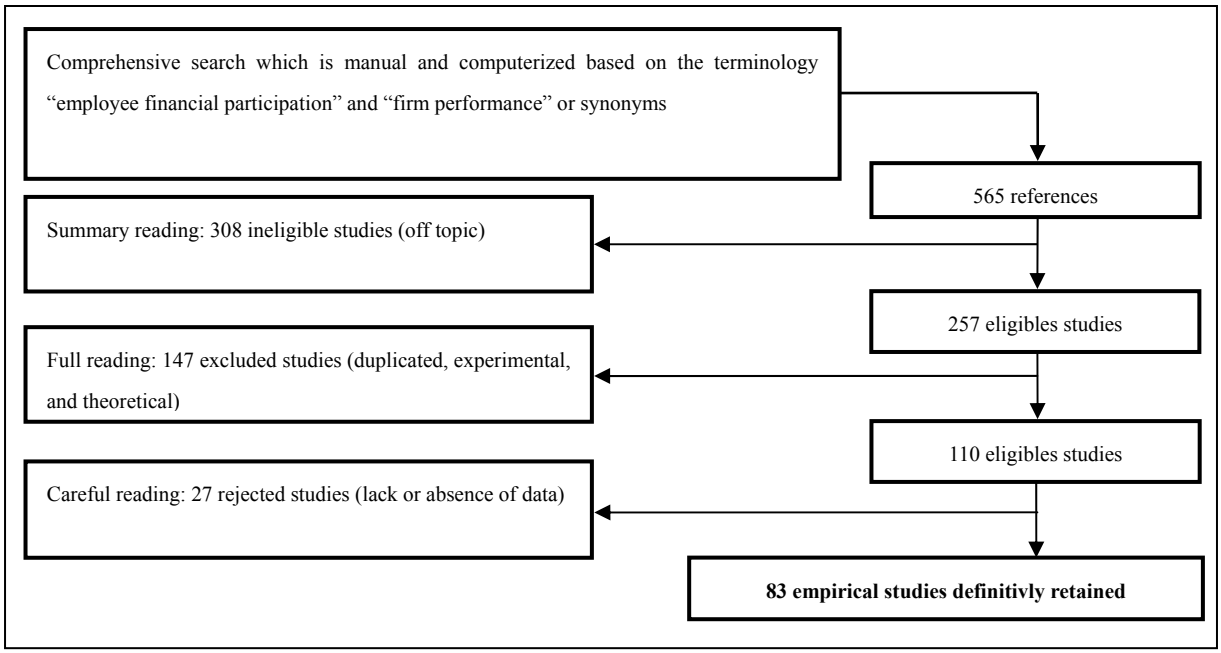

Figure 1. Selection process

The phase of coding aims to prepare the whole of the observations for the statistical processing (Wilson, 2009). The selected studies are subjected to a process of coding in order to identify the variables which reflect their differences as well as the indicators selected to measure them.

The studies sample is subdivided in two groups according to whether it is question of measuring the impact of the financial participation on the economic performance or on the social performance (Table 2). The indicators which measure the economic impact can be grouped in two categories: the first measuring the accounting performance and the second the stock exchange performance. The indicators which measure the social impact are indicators of behavior equally distributed between the absenteeism and the turnover. With final, they are two databases, the first relates to the economic performance and the second is interested in the social performance, respectively made up from 70 and 24 studies (Note 1). Meta-analysis is separately conducted according to whether it is a question economic performance or social performance.

Table 2. Sample distribution studies according to the performance dimension

Firm performance			Number of partial correlation coefficients
Economic:	Accounting	Productivity	145
70 studies		Sales	7
		Profits	15
		ROA	14
		ROE	10
		ROC	7
		ROI	5
		ROS	2
	Stock market	Tobin's Q	6
		Stock returns	5
		Stock value	4
		Excess value	2
		Earning per share	2
		Dividend yield	1
		Exchange rate	1
Social: 24 studies		Absenteism	31
		Turnover	28
Total			285

4.3 Step 3: The Transformation of the Statistics Available into Only One Metric

This stage of the analysis, it is question of deciding about the commune metric to retain, called the effect size, in order to measure the bond between the two variables of interest. It is possible to carry out the aggregation of the results only on the condition of retaining the same index and to convert those which are different thanks to the conversion expressions (Borenstein et al., 2009). Two types of indices of effect size are often employed: the standardized difference averages *d*, employed in the framework of the experimental studies and the partial correlation coefficient *r*, used within the framework of the correlationnal studies.

All 83 empirical studies made it possible to obtain 285 observations, i.e. partial correlation coefficients (Note 2). The choice of the partial correlation coefficients as a commune indicator is explained by the number of correlationnal studies appearing in our sample and by its major advantage compared to the calculation of the *d* index (Rosenthal & Dimatteo, 2001): the correlation gives an account of the relation between the level of the financial participation (the independent variable) and the changes anticipated on the level of the performance (the dependant variable).

Within the framework of our research, the partial correlation coefficient is calculated thanks to the various statistical measurements posted in the selected studies and whose formulas are in several works, in particular that of Wolf (1986), Rosenthal (1987) and Hunter and Schmidt (2004). However, Hedges and Olkin (1985) criticize the use of the partial correlation coefficient because they do not always follow a normal distribution. They recommend, in order to standardize the distribution, to transform it into an index called "*Fisher's Z-transformation"*. The interest of this transformation, in addition to standardizing partial correlation coefficients, is to stabilize the variance of the initial distribution.

4.4 Step 4: Determination of the Mean Effect Size

Meta-analysis consists in incorporating the results of the distinct studies in order to check if a total tendency, called the mean effect size, can be identified. This aggregation is not a simple addition of the effect sizes of the various studies, but a procedure which evaluates the results of each study compared to its precision (Note 3). The found value makes it possible to reveal the nature of the relation between the two variables of interest and its intensity.

Following the estimate of the mean effect size, it is advisable to proceed to:

- The appreciation of the publication bias: Meta-analysis is a systematic and quantitative review of the scientific knowledge in a given field. Validity of the results which it poster is affected if there is exclusion of the work not published in indexed reviews or posting contrary results with the theoretical proposals or obtaining results which are not significant. The evaluation of the publication bias is carried out thanks to three tools: *the funnel plot* (Egger et al., 1997), the test of Egger et al. (1997) and the *fail-safe N* of Rosenthal (1979) (Note 4).

- The evaluation of the heterogeneity of the results: The appreciation of heterogeneity consists in checking if the studies share truly common effect sizes, in other words if the results of studies are homogeneous between them (Laroche & Soulez, 2012). The evaluation of heterogeneity consists of the realization of two tests. The first

is a Cochran test; it makes it possible to test the hypothesis of homogeneity of the studies. The second makes it possible to appreciate the proportion of the variance observed which reflects the real differences in the effect size, i.e. the magnitude of the heterogeneity of the studies, by calculating the I^2 statistics (Note 5).

The whole of these statistical processing (the estimate of the mea effect size, the appreciation of the publication bias and the evaluation of heterogeneity will make it possible to validate, or not, the two hypotheses relating to the impact of the employees' financial participation on firm performance. It is the purpose of the following section.

5. Validation of the Hypotheses

The determination of the mean effect size is treated in a first stage. The appreciation of the publication bias and the evaluation of the heterogeneity results are treated successively in the second stage and the third stage.

5.1 Impact on the Economic Performance

Table 3 brings back the whole of the statistics on the impact of the financial participation on the firm economic performance by distinguishing its two aspects, accounting and market. The mean effect size is positive and statistically significant with at 5%. This report is valid for the two categories, accounting and stock exchange. Apprehended overall, the impact of the financial participation on the economic performance is about 7,72% (7,87% for the accounting performance and 6,21% for the stock exchange performance). These results enable us to validate the hypothesis H1according to which the employees' financial participation is positively related to the economic performance of the firms.

Table 3. Impact of financial participation on firm economic performance

Economic performance	Sample size	Number of studies	Number of correlation coefficient	$\bar{r}$	Confidence interval	z-value	p-value
Accounting and stock market	279963	70	226	0.0772	[0.0666; 0.0878]	14.2803	0.0000
Accounting	267519	70	205	0.0787	[0.0678; 0.0896]	14.1009	0.0000
Stock market	12444	8	21	0.0621	[0.0157; 0.1082]	2.6228	0.0087

5.2 Impact on the Social Performance

The impact of the financial participation on the social performance is operated through two indicators which are the absenteeism and the turnover (Table 4). The mean effect size of the negotiable instrument, measuring the bond between the financial participation and the social performance, is negative and statistically significant at 5%, that is to say -5,78% (it's a negative sign because the social performance is measured by the absenteeism and the turnover). The employees' financial participation makes it possible to lower the employee absenteeism of 2,80% and their turnover of 6,89%. We conclude that the hypothesis H2 is validated: the employees' financial participation is positively related to the social performance of the firms.

Table 4. Impact of financial participation on firm social performance

Social performance	Sample size	Number of studies	Number of correlation coefficient	$\bar{r}$	Confidence interval	z-value	p-value
Absenteeism and turnover	290819	24	59	-0.0578	[-0.0794;-0.0361]	-5.2210	0.0000
Absenteeism	178333	14	31	-0.0280	[-0.0438; -0.0122]	-3.4651	0.0005
Turnover	112486	15	28	-0.0689	[-0.1111; -0.0264]	-3.1775	0.0015

In addition, the analysis of the impact of the financial participation is examining according to the scheme (profits-sharing or gain-sharing) and according to the performance dimension (economic or social) in order to answer the question: is there a relation between the dimension of the performance concerned and the type of the

adopted scheme? The results enable us to affirm that the impact is significant and favorable independently of the category of the device and dimension of the performance (Table 5). However, the impact of profit-sharing on the economic performance seems to be higher than that of the gain-sharing (8,01%> 5,74%). In addition, the results affirm that the improvement of the social performance is stronger in the presence of a scheme of gain-sharing (- 8,09%) compared to that in the presence of a scheme of profit-sharing (- 4,54%).

Table 5. Impact of financial participation on firm performance depending on the nature on the plan and of the performance

	Impact on economic performance	*Impact on social performance*
Profit-sharing	8,01%	- 4,54%
Gain-sharing	5,74%	- 8,09%

5.4 Appreciation of the Publication Bias

5.4.1 Economic Performance

The upper part of the funnel plot (Figure 2) represents a strong concentration of points what means that the majority of the studies selected are based on broad samples. These studies are precise because their standard deviations are very weak and their partial correlation coefficients are close to the mean effect size. The base is wider than the top, mainly of the right-sided. It consists of studies having samples of reduced sizes and high standard deviations what makes them less precise. On the whole of Figure 2, a stronger concentration of the observations of the left side of the mean effect average size is observed. This means a priori the existence of a publication bias which must be validated by the asymmetry test of Egger et al. (1997).

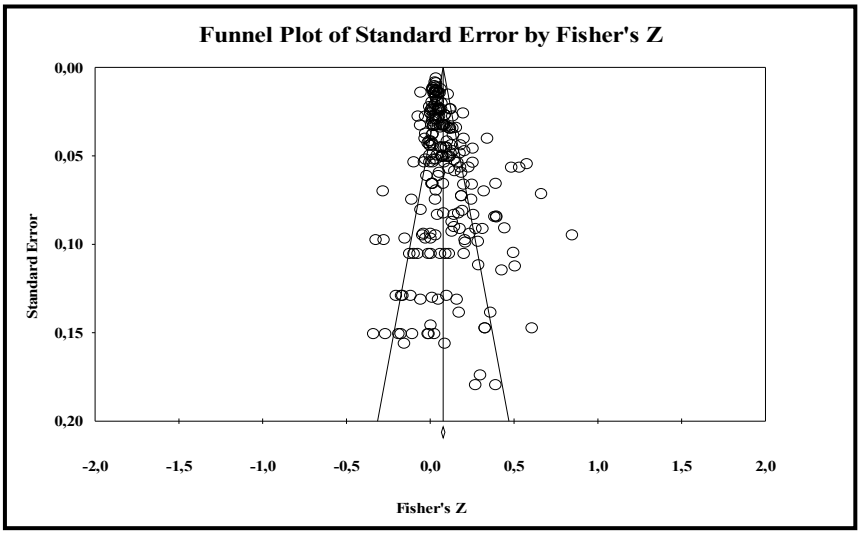

Figure 2. Funnel plot of the relation between employees' financial participation and firm economic performance

The visual examination of asymmetry is confirmed by the results obtained from the regression of Egger et al., (1997): at 5%, the results reveal a constant significantly different from zero ($\beta_0 = 1{,}21833\,;\ p < 0{,}0000$). Asymmetry is thus confirmed, and consequently the existence of publication bias relating to the studies treating of the impact of financial participation on the economic performance. The constant presents a positive value what means over-representation of the studies posting a positive bond between economic performance and profit and gain sharing. The real impact of the profit-sharing on the economic performance is positive but less important than that which is commonly brought back on average in the literature.

The recourse to the process of Rosenthal (1979) makes it possible to test the robustness of the meta-analysis results. Within the framework of this work, at 5%, it would be necessary to integrate 2254 "excluded" studies so that the results of meta-analysis are not more significant. This number is quite higher than $((226 \times 5) + 10)$, that is to say 1140. In addition, it is not very probable that as many studies (2254) exists and that they are not

published.

We thus conclude that the results obtained by the present meta-analysis relating to the relation "financial participation – economic performance" are statistically robust in spite of the confirmation of the presence of a publication bias.

5.4.2 Social Performance

The funnel plot makes it possible to make two reports (Figure 3). The first relates to the density of the effect sizes: it is stronger on the top level what wants to say that the majority of the studies retained in meta-analysis is bases on samples of big sizes. The second report is relating to the concentration of the effect sizes on the level of the left side of the mean effect size constituting a form of selective publication.

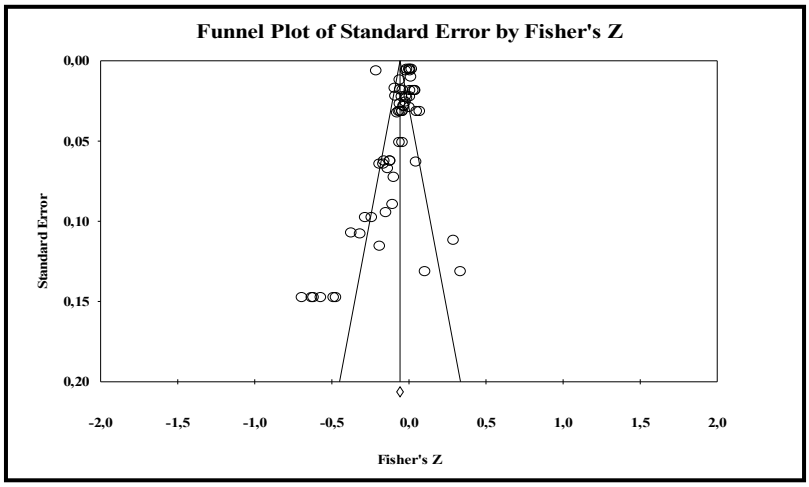

Figure 3. Funnel plot of the relation between employees' financial participation and firm social performance

The publication bias, noted in a graphic way is not confirmed by the asymmetry test of Egger et al. (1997): at 5%, the null hypothesis of the constant, which wants to say the absence of asymmetry, cannot be rejected because its estimate is not statistically significant ($\beta_0 = -1{,}30156\,;\ p < 0{,}12199$). It should be recalled that the publication bias is not the only cause of the asymmetry of the funnel plot, the heterogeneity of the studies and the irregularities in the primary data can also be the reason (Egger et al., 1997).

Concerning the number of studies which it would be necessary to add to those retained in meta-analysis in order to make its results not significant at 5%, the formula of Rosenthal (1979) gives a number which is equal to 3117. This number is quite higher than $((59 \times 5) + 10)$, that is to say 305. It is not very probable that as many studies are carried out without to be published.

Final, the graphic and statistical analysis makes it possible to conclude that the studies retained in the empirical corpus relating to the relation "financial participation – social performance" present a publication bias, without deteriorating the significance of the meta-analysis results which remain robust.

5.5 Evaluation of the Heterogeneity of the Results

The results show, as well for economic dimension as for the social dimension of the performance, that heterogeneity test is strongly significant (Table 6). The studies retained in meta-analysis are heterogeneous and the mean effect size is not constant from one study to another.

Table 6. Homogeneity tests

Performance	Mean effect size $\bar{r}$	Q	ddl	p-value	I^2
Economic	0.0772	1258.6685	225	0.0000	82.1240
Social	- 0.0578	1353.0300	58	0.0000	95.7133

The application of the I^2 statistics, measuring the variability of the mean effect sizes which is due to heterogeneity and not randomly, gives high values, 82% and 95% respectively for the economic performance and

the social performance. That shows a high heterogeneity of the partial correlation coefficients, and thus of the studies from where they are extracted.

6. Conclusion

This research was given the objective to examine the relation between the employees' financial participation and firm performance. We proposed to slice the debate relating to the question of knowing if it really exists and in which case, which is its nature.

This interrogation is not recent. It was often posed in the academic and professional literature and the answers brought were compartmental, multiple and different, and even contradictory. The abundance of the literature is the irrefutable proof that this topic is treated under more than one angle so that each time the question of the bond between this other form of compensation, always remains current. The majority of the work completed in developed environments allots to the financial participation positive and significant role in the improvement of firm performance. This conclusion is valid as well if one considers the performance under his economic meaning that under his social dimension.

The validation of the hypotheses was carried out by having recourse to the approach of meta-analysis. This one has the major advantage not to be interested in a particular environment but to consider the whole of the literature as well as the results which emerge from research carried out on different grounds. We in particular highlighted the three axes around whose turns the meta-analytical approach. It is initially about the constitution of an empirical corpus through an argued selection of the studies published and not published. We retained 83 of them. That consists then of the quantification of the relation "financial participation – performance" by having recourse to the estimate of effect size which is the partial correlation coefficient. The examination of the database enabled us to estimate this coefficient for 226 coefficients in connection with the economic performance and 59 others in relation to the social performance. The third stage finally consists of the aggregation of the whole of the coefficients in order to consider the mean effect size for each of the two performance dimensions.

The results obtained made it possible to confirm the two following hypotheses:

- The employees' financial participation is positively and significantly related to the economic performance of the firms: those which adopt such a device would see their accounting and stock performances being appreciated respectively of almost 8% and 7%.

- The employees' financial participation is positively and significantly related to the social performance of the firms. Indeed, a fall of the employees' absenteeism about 3% and their turnover of almost 7%, is noted near the firms which adopt a device of financial participation to the profit of their employees.

The managerial applications of this research are obvious. The impact of the employees' financial participation on firm performance depends as well on the category of the device as of dimension of the performance: the improvement of the economic performance is higher in the presence of profit-sharing schemes whereas the social performance is better with the adoption of devices of gain-sharing. The choice of the firm between these two categories of schemes is not without effect on the performance level obtained and the nature of dimension concerned.

The prolongation of this work would be to explain the causes of the heterogeneity of the results which we obtained while proceeding to meta-analysis regression (Hunter et al., 1982; Stanley & Jarrell, 1989; Stanley, 2001). Indeed, and in the case of an excessive heterogeneity of the obtained results, this approach which consists of a multiple regression would make it possible to identify the causes of this disparity.

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Notes

Note 1. Some studies have dealt simultaneously both performance dimensions (economic and social) which appear in both databases.

Note 2. Comprehensive Meta-Analysis software (Version 2) was used for all statistical processing.

Note 3. Under the fixed effect model, the first step is to calculate the mean effect size $\bar{z}_r$:

$$\bar{z}_r = \frac{\sum_{i=1}^{k} w_i z_{r_i}}{\sum_{i=1}^{k} w_i}$$

z_{r_i} : The transformation of the effect size r_i of the study *i* defined as: $z_{r_i} = \frac{1}{2} ln \frac{1+r_i}{1-r_i}$

w_i : The weight of the effect size *i* defined as: $w_i = \frac{1}{SE^2{}_{z_i}} = \frac{1}{V_{z_i}}$

Where: $V_{z_i} = \frac{1}{n_i - 3}$ is the variance of the effect size *i* , n_i corresponds to the sample size of the study *i* and SE_{z_i} is the standard deviation

K : The number of studies

The second step is to calculate the variance and the confidence interval of $\bar{z}_r$:

$$Confidence\ interval = \left[\bar{z}_r - 1{,}96\sqrt{V_{\bar{z}_r}}; \bar{z}_r + 1{,}96\sqrt{V_{\bar{z}_r}}\right]$$

Where $V_{\bar{z}_r}$ the variance of $\bar{z}_r$ defined as: $V_{\bar{z}_r} = \frac{1}{\sum_{i=1}^{k} w_i}$

The last step is to calculate the mean effect size $\bar{r}$ and its confident interval:

$$\bar{r} = \frac{e^{2\bar{z}_r} - 1}{e^{2\bar{z}_r} + 1}$$

$$Confidence\ interval = \left[\bar{r} - 1{,}96\sqrt{V_{\bar{r}}}; \bar{r} + 1{,}96\sqrt{V_{\bar{r}}}\right]$$

Where $V_{\bar{r}}$ the variance of $\bar{r}$ defined as: $V_{\bar{r}} = \frac{(1-\bar{r}^2)^2}{N-k}$ and N is the size of the total sample and N is the size of the total sample.

Note 4. The detection of publication bias in the results of a meta-analysis is done through a graphic called *the funnel plot* (Egger et al., 1997). It illustrates the association between an empirical effect (the effect size estimated by the z_r Fisher coefficient) and its estimated precision (measured here as the inverse of the effect's standard deviation), takes the form of an inverted funnel. In the case where the meta-analysis suffers from bias, the graph takes an asymmetric shape with respect to the estimated mean effect size, indicating a selective inclusion studies. In the opposite case, that is to say a non selective inclusion, the graph takes a symmetrical shape, centered on the mean effect size.

Two other tools can accompany the graphic detection of this bias. The first is the publication bias test of Egger et al. (1997) based on a linear regression between the effect size derived from each study and its standard deviation. The existence of a significant constant signifies the presence of a publication bias. The second tool is the "number of studies in the drawers", says *the fail-safe N* of Rosenthal (1979) based on the determination of the number of missing studies in the meta-analysis, whose consideration would make the results insignificant. This number should be less than ((N × 5) + 10) where N is the number of studies included in the meta-analysis.

Note 5. The value of I^2 should not exceed 25% in order to reach a certain homogeneity of the study results (Higgins et al., 2003).