

## A Meta-Analysis Applied To The Employee Ownership-Firm Performance Relationship

تطبيق التحليل البعدي على العلاقة ملكية الموظف-أداء المؤسسة

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### **Abstract :**

In this article we have carried out a meta-analysis of eighty empirical studies carried out by researchers in different countries in the world over the past forty years in order to examine the impact of employee ownership on firm performance. Our results show small but positive and statistically significant effects for the different studies using different empirical methodologies.

**Keywords:** Firm Performance, employee ownership, meta-analysis.

**JEL classification codes:** L25; M52; C55;

### **ملخص:**

في هذه المقالة أجرينا تحليلاً بعدياً لثمانين دراسة تجريبية أجراها باحثون في دول مختلفة من العالم على مدى الأربعين عاماً الماضية و ذلك من أجل فحص تأثير ملكية الموظفين على أداء المؤسسات. تظهر نتائجنا آثاراً صغيرة ولكنها إيجابية وذات دلالة معنوية من وجهة نظر إحصائية لمختلف الدراسات التي تستخدم منهجيات تجريبية مختلفة.

**الكلمات المفتاحية:** أداء المؤسسة ، ملكية الموظف ، التحليل البعدي.

**تصنيف JEL:** C55 ، M52 ، L25

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**Introduction :**

From a theoretical point of view, employee ownership is therefore gradually establishing itself as an essential mechanism for distributing profits. It also allows a renewal of the space for social dialogue, particularly between managers and employees, and offers a possible reconfiguration of the Capital / Labor relationship. The massive spread of employee ownership raises questions about the consequences of employee ownership on the firm performance. As a result, our review of the literature on employee ownership brings together empirical economic and financial work that is interested in showing that employee ownership would have positive effects on firm performance, assessed using various indicators. Regarding the suggested mechanisms, most authors link the effect of employee ownership on performance to a change in the attitudes and behaviors of employee shareholders at work. Our general research theme therefore aims to analyze the effects of employee ownership on firm performance. In this framework, the interests of our work (the importance of the topic) are multiple and spread over three levels: At the ***theoretical level***, our theoretical analysis allowed us to determine the nature of the relationship between employee ownership and firm performance. ***At the methodological level***, the interests of this work concerns all the elements of the process of analyzing the relationship between employee ownership and firm performance. ***At a practical level***, the interest of this work is to highlight, by comparing the literature on the question and our own results, the conditions for developing a synthetic and dynamic research program on the effects of employee ownership.

**Problematic and Hypotheses:**

We can formulate our research problematic in the following way:

***What are the effects of employee share ownership on corporate performance?***

Starting from the research problematic as it was stated, we can formulate the four main hypotheses of our research as being:

- H1: the effect of employee ownership on performance is positive and significant;
- H2: companies with employee ownership have superior performance compared to those that do not;
- H3: the presence of employee ownership is positively and significantly linked to the performance of the firm;
- H4: the duration of the existence of employee ownership is positively and significantly linked to the performance of the firm.

**1. The Concept of Employee Ownership: “An Unique Appellation for Very Different Practices”:**

The National Center For Employee Ownership (NCEO) in the United States (USA) defines employee share ownership as: "a plan in which the majority of employees own shares in their company, even if they cannot exercise the voting

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right attached to the shares and even if they cannot resell them before they leave the company". The FAS proposes the following definition: "The employee ownership is an employee or former employee, French or not, of a company under French law or of a company of any nationality, linked or formerly linked to a company under French law, who has acquired shares in his company or related companies, which it holds directly in registered form or indirectly, during an operation resulting from a common pact with the company " (FAS, 2006).

### **2. The Different Forms and Plans of Employee Ownership:**

#### **2.1. The Different Forms of Employee Ownership:**

**The acquisition of shares (stock):** the acquisition of shares (stock) by employees can be carried out at the market price or, as in most cases, at a discounted price. The source of money can be employee capital, profit sharing, or performance incentive bonuses, company contributions and / or a loan as is the case for ESOPs in the United States.

**The direct or indirect nature of employee ownership:** the difference is important between what is called direct employee ownership, in which the employee directly owns shares in his company, and indirect employee ownership, in which another entity intermediary (the ESOP in the USA).

**Liquidity and stability of shares:** There are different regimes under which shares can be resold: the most liquid shares are those that can be resold easily, but this can result in instability of employee ownership.

**The share of employees who are shareholders:** There can indeed be extreme cases, with on the one hand companies where all employees are shareholders and on the other hand where only managers or senior management are shareholders.

**The share of capital held by employees:** the percentage of capital held by employees is a fundamental parameter. This percentage varies according to the case: the case of a company owned 100% or mainly by its employees is totally different from a multinational company which has set up an employee ownership plan and of which only a few percent of the capital is held by employees.

**2.2. The Different Plans of Employee Ownership:** We will only focus on the cases of the United States, the United Kingdom and France, these three countries where employee ownership is more developed. Indeed, all employee ownership practices around the world are inspired by these three countries.

**2.2.1. Employee Ownership In the United States:** According to the National Center of Employee Ownership (NCEO), there are three (03) main forms of employee ownership that are currently in use in the United States ([www.nceo.org](http://www.nceo.org)):

- ***ESOP plans (Employee Stock Ownership Plan):*** These plans allow employees to acquire shares in their companies with tax advantageous conditions and frequent matching from their employer.
- ***401 (K) Plans:*** These plans are named after the article of the Federal Tax Code that governs their operation. In practice, these are investment funds created by companies and which allow employees to invest part of their salary.
- ***Employee Stock Purchase Plans (ESPP):*** They are the plans most used by multinationals and more generally by listed companies. In these plans, the employer can offer his employees the option of buying shares in his company at market value or at a discount of 5 to 15%.

**2.2.2. Employee Ownership In the United Kingdom:** Companies in the United Kingdom choose between three employee share plans approved by the tax authorities that offer tax advantages, the main plans are as follows (Pendleton. A and Wright. M, 2000):

- ***Save As You Earn Plans:*** In these plans, employees can buy shares in their companies at a predetermined price which can be discounted by up to 20% from the current price.
- ***Share Incentive Plan (SIP):*** In these plans, there are three formulas: - Purchases of shares up to a limit of 1500 pounds per year or 10% of salary; - Free allocations up to a limit of 3000 pounds per year; - And a company contribution limited to 2 shares for one purchased.
- ***Company Share Option Plan (CSOP):*** In this plan, the distribution of options is without discount on the value of the shares, for a maximum value of 30,000 pounds per employee. For the employee, the gain recorded during the exercise of the option is exempt from income tax and social security contributions when this exercise is exercised within a period of between 3 and 10 years.

**2.2.2. Employee Ownership In France:** In France, the main vehicles for employee shareholding are: Company Savings Plans, and Group Savings Plans:

- ***Company Savings Plans (PEE):*** PEEs were created by the ordinance of August 17, 1967 and which are likely to accommodate securities issued by companies affected by the obligation of legal participation of employees in the results. Company Savings Plans (PEE) only concern companies with more than 100 employees.
- ***The Group Savings Plan (PEG):*** The Group Savings Plan (PEG) is intended for employees of all companies belonging to the same consolidated group.

### **3. The Place Of Employee Ownership In The Shareholder Approach And The Stakeholder Approach To Corporate Governance:**

#### **3.1 The Place Of Employee Ownership In The Shareholder Approach:**

In the 1970s, a model of corporate governance emerged based on the reaffirmation of shareholder power. This model is based on two large important

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sections of economic theory: the theory of property rights and the theory of the agency.

### **3.1.1 The Effects Of Employee Ownership On The Property Structure:**

**Explanations of the Theory of Property Rights:** Hollandts (2007) underlines that from the point of view of the efficiency of firms with employee ownership, it is possible to identify two major criticisms in terms of property rights (Hollandts, 2007):

- **Employee ownership decreases the effectiveness of the attenuated private property structure:** Hollandts (2007), summarizes the consequences of employee ownership on the effectiveness of a private property structure as being: *Employee ownership allows property rights to be granted to employees.* Employee ownership corresponds at least to a reduced property structure (which can go up to a collective property structure, depending on the percentage of employee ownership and the legal regime of the firm). *In the case of companies characterized by a separation between property and management,* employee ownership represents a source of less efficient property structure leading to higher agency costs, conflicts of interest (shareholders/employees), higher decision-making costs, divergence of time horizon and preference for the present.

- **Employee ownership decreases the effectiveness of Collective Private Enproperty structure:** Gomez and Korine. (2009), show that granting property rights to employees can weaken the efficiency of the ownership structure. The authors advance the following arguments ( Gomez and Korine, 2009):

*Cooperators tend to maximize income per employee* instead of maximizing profits and will tend to overexploit production majors in order to derive greater personal profit. *Another perverse effect of the cooperative:* the reluctance to hire other cooperators due to the corresponding decrease in the profit shared between each cooperator. *Finally, the cooperatives under-invest:* the cooperators would demand a higher return on the investments, which would mean that certain profitable investments would not be undertaken.

### **3.1.2 The Role of Employee Ownership In The Agency Theory: the decisive role of stock options:**

the authors predominantly Anglo-Saxon such as Eaton and Rosen (1983), Holmström and Ricart and Costa (1986) or even Hirshleifer & Suh (1992), have all theoretically and formally confirmed the decisive place of executive shareholding, by proposing a strategy “judiciously” combining the exercise of purchase options and sale options (the latter being representative of convertible stock options in the capital structure) held respectively by the manager-owner and external contributors capital.

### **3.2. The Place Of Employee Ownership In The Stakeholder Approach:**

According to Freeman (1984), the first time this term emerges was in 1963 during a strategic reflection led by Ansoff and Stewart at the Stanford Research

Institute SRI (Freeman, 1984) . It appears that Ansoff (1968) was the first author to refer to the Stakeholder Theory (SHT) in order to define the organizational goals of the firm. Afterwards, the term “Stakeholder” was truly generalized by Freeman (1984).

**3.2.1 The Employee Ownership and Stakeholder Theory:** The Stanford Research Institute (1963) defines stakeholders as "Groups without whose support the organization would cease to exist" (cited by Freeman, 1984, p. 31). The stakeholder model makes employees real partners by granting them institutionally positions as administrators, and by recognizing the importance of their investment in human capital and their importance in the creation of value of the firm.

**3.2.1 The Role Of Employee Ownership In The Stakeholder Approach:** In the stakeholder model of corporate governance, the employee ownership should play a two-headed role which can be exercised on two levels:

***A formal level, through employee participation in corporate governance bodies such as the board of directors:*** Aoki (1984) and Williamson (1985), Jensen and Meckling (1995), these authors assert that the representation of employee shareholders in the governance body, and in decision-making, influences the agency relationships that share employees with shareholders, but also with managers, which shows that the importance of human capital specific to the firm is compatible with the traditional conception of the firm, and further underline that the representation of employees, allowing them to share important information concerning in particular the organization of work, collective negotiations, in particular in difficult economic times for the firm.

***And at an informal level, through the establishment of a trust system that promotes cooperation between employees and managers on the one hand, and employees and shareholders on the other:*** The installation of an employee shareholding policy favoring the establishment of a trust system within the firm, in particular among managers and employees by allowing them to be confident in the future of their firm, can also induce the same feeling of trust among other partners, in particular the shareholders of the firm, which would consequently lead to the creation of partnership value.

**4.The Effects of Employee Ownership on Performance: Nature and Characteristics of the Relationship:**Three types of effects can be determined: 1- negative effects, 2- neutral effects, 3- positive effects.

**Table (01): Three types of effects of employee ownership on performance**

Nature of The Effects	Empirical Studies	Results
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<b>The Negative Effects of Employee Ownership on Performance</b>	Livingston and Henry (1980), Chang (1990), Gordon and Pound (1990), Chang and Mayers (1992), Beatty (1995) and Blasi and al. (1996), Park and Song (1995), Faleye, Mehrotra, & Morck, (2006).	Livingston and Henry (1980) were the first to show the existence of a negative effect of employee shareholding on firm performance.
<b>The Neutral Effects of Employee Ownership on Performance</b>	Bloom (1986), American General Accounting Office (GAO, 1987), Conte and Svejnar (1990), Borstadt and Zwirlein (1995), Blasi, Conte, & Kruse (1996), Lougee (1999), Charreaux (1991), Gordon and Pound (1990), Pugh, Jahera, & Oswald (1999).	In this second category, there are also relatively few studies. Indeed, studies show a neutral effect of employee ownership on company performance or insignificant effects.
<b>The Positive Effects of Employee Ownership on Performance</b>	Conte and Tannenbaum (1978), Marsh and Mc Allister (1981), Wagner and Rosen (1985), Fitzroy and Kraft (1987), Chang (1990), Davidson and Worell (1994), Oswald and Jahera (1991), Kumbhakar and Dunbar (1993), Jones and Kato (1993), Beatty (1994), Park and Song (1995), Mehran (1999), Welbourne and Cyr (1999), Iqbal and Hamid (2000), Park, Kruse, & Sesil (2004), Kruse and Blasi (1999), Blair and al. (2000), and Kruse (2002).	Empirical studies of this category of effects show the existence of a positive effect of employee ownership on firm performance. In addition, firms must take into consideration the impact of the application context which remains a determining condition for having better performance because all the available research shows that companies will benefit from better results if employee ownership is integrated into a effective participation policy.

Source: our elaboration.

**5. The Moderating Factors Of The Employee Ownership-Firm Performance Relationship: The Explanatory models of the effects of employee ownership on the attitudes and behavior of employee**

**shareholders** In a famous work, Klein (1987) distinguishes three explanatory models by which employee ownership can have a positive effect on the attitudes and behaviors of employee shareholders Klein (1987), and which have been largely taken up by subsequent research (Caramelli.M, 2011).

**Table (02): The Explanatory models of the effects of employee ownership on the attitudes and behavior of employee shareholders**

<b>The Explanatory models</b>	<b>Results</b>
<b>The intrinsic satisfaction model</b>	The results of empirical research that tested this model show that the presence of employee ownership in itself rarely leads to significant changes in the attitudes of employee shareholders.
<b>The Instrumental</b>	This instrumental model suggests that employee ownership has a

<b>satisfaction model</b>	positive effect on the attitudes and behaviors of employee shareholders, if it is accompanied by opportunities offered to employees such as participation in decision-making
<b>The extrinsic satisfaction model</b>	The abundant literature that has analyzed this extrinsic model shows overall that the financial value of employee ownership is an interesting variable in understanding employee attitudes and behaviors.

**Source:** Klein. K, « employee stock ownership and employee attitudes: a test of three models », Journal of applied psychology, vol 72, 1987, P.P. 319-332.

**6. Presentation of the Empirical Approach: The Meta-analysis**

**6.1. Definition of Meta-analysis:**

The American statistician Gene V Glass the first who gave and explicitly defined the term "meta-analysis" in 1976. Gene Glass (1976), defines meta-analysis as "the statistical analysis of a large quantity of analysis results from several independent studies which aims to integrate these results and conclusions" (Glass, 1976).

**6.2. The principal steps Of Meta-analysis:**

The conduction of a meta-analysis requires following a very precise procedure made up of well structured steps:

**1- Formulate a research question:** Define the variables of interest and specify the relationship studied in order to identify the studies concerned; **2- Research and collect existing empirical studies:** Identify the sources (databases, type of journals, etc.) and keywords used to search for the studies concerned; **3- Selection of studies:** Apply criteria to select studies. Define the inclusion and exclusion criteria; **4- Code the studies collected:** Select the relevant information and establish a list of the characteristics of the studies that you want to collect; **5- Estimate a common metric:** In order to measure the overall effect size (effect size), there would be over seventy varieties which are not all equally popular. Generally, these varieties are grouped into two main categories of effects:

➤ The first is known as "*d family*": which concerns the differences in means between the two groups, the experimental group and the control group;

➤ The second is known as "*r family*": which concerns correlational studies which present measures of correlation between two or more variables. We remember that our studies fall into the second category, the "*r family*"

**➤ 5.1.Measuring the Effect Size in the Case of Correlation-type Searches: The Partial Correlation Coefficient « r »:**

To calculate the effect size Wolf (1986) proposed the following formula (Wolf, 1986):

$$r = \sqrt{\frac{t^2}{(t^2 + ddl)}}$$

Where: *t*: is the t of student relative to the main explanatory variable;

*ddl*: is the number of degrees of freedom relative to the regression equation and is calculated as: *ddl* = *n* - *m* - 2. Where: *n*: is the sample size; *m*: is the number

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of explanatory variables used. In the case of correlational studies, the measure of an average effect size is calculated using a correlation or regression coefficient  $r$ . Hunter, Schmidt and Jackson (1982) propose calculating these correlation coefficients  $r$  by using this formula:

$$\bar{r} = \frac{\sum_{i=1}^k n_i r_i}{\sum_{i=1}^k n_i} \quad \text{Where: } n_i \text{ and } r_i \text{ represent respectively the sample size of the}$$

study, and the effect size of the study "i". With:  $\bar{r}= 0.1$  : Weak Effect,  $\bar{r}= 0.25$ : Medium Effect,  $\bar{r}= 0.4$  Strong Effect. The variance and confidence interval of are calculated using the following formulas:

$$V_{\bar{r}} = \frac{(1 - \bar{r}^2)^2}{n - 1}$$

With:  $n$  is the sample size.  $IC_{r,95\%} = (r - 1.95\sqrt{V_{\bar{r}}} \leq r \leq r + 1.95\sqrt{V_{\bar{r}}})$ .

The heterogeneity is defined as the rejection of the hypothesis which supposes the homogeneity of the effect sizes. For our meta-analysis we use the Hunter, Schmidt and Jackson's (1982) approach. This approach corresponds to the variance of the population which is calculated by the following formula (Laroche & Soulez, 2012):

$$S_r^2 = \frac{\sum_{i=1}^k N_i (r_i - \bar{r})^2}{\sum_{i=1}^k N_i} \text{ observed variance.}$$

The following formula calculates, in a third step, the part of the variance of the effects due to sampling errors:

$$S_{sr}^2 = \frac{k(1 - \bar{r}^2)^2}{\sum_{i=1}^k N_i} \text{ Variance due to sampling errors.}$$

With:  $k$  is the number of studies in the sample. Finally, the difference between the observed variance and the variance related to the sampling error corresponds to the residual variance:  $S_{p_{xy}}^2 = S_r^2 - S_{sr}^2$  Corrected or residual variance

If the residual variance is less than 25% of the total variance, this means that the effect sizes are homogeneous. Otherwise, the meta-analyst must look for moderating variables. Indeed, this test is not sufficient to test the homogeneity of samples with small studies. Another additional homogeneity test has been proposed by Hunter, Schmidt and Jackson (1990) in their new procedure, it is a non-parametric test which follows a Khi-deux law and it has the same treatment as that Cochran's  $Q_T$ :

$$\chi_{k-1}^2 = \frac{N}{(1 - \bar{r}^2)^2} S_r^2$$

Ultimately, the search for moderating variables, in the sense of Hunter, Schmidt and Jackson (1990), must be based on a series of criteria which are:

- The rule of **75%** of the residual variable;
- The homogeneity test which follows a Khi-deux distribution;
- The **95%** confidence interval knowing that if this interval includes the value **0**, we accept the null hypothesis of a coefficient

$r_{xy}=0$  at the 5% threshold, which augurs the difficulty of evaluating the intensity of the link between the two variables and of heterogeneity studies.

**6-Analyze and integrate the empirical results of the studies:** Identify and apply procedures to combine results and test the differences between the results of the studies;

**7- Search for the possible influence of moderating variables:** synthesize the results of the meta-analysis.

### **7.Meta-Analysis Applied to the Employee Ownership-Corporate Performance Relationship:**

#### **7.1.Descriptive Meta-Analysis Applied to the Employee Ownership-Corporate Performance Relationship:**

**7.1.1) - Collection of Empirical Studies:** we carried out a thorough, exhaustive and meticulous search of all empirical research by recurring both computerized databases such as EBSCO, JSTOR, PROQUEST and SCIENCEDIRECT for Anglo-Saxon studies, CAIRN and DELPHES for French studies , and to specialized electronic editions such as EMERALD INSIGHT, WELLY LIBRARY, ELSEVIER, ECONPAPERS, and to search engines such as GOOGLE SCHOLAR.

**7.1.2) - Selection Of Empirical Studies:** The selection process of the empirical studies allowed us to identify 80 empirical studies presenting 117 observations concerning the number of the partial correlation coefficients  $r$ . In total we obtained 80 empirical studies with 117 partial correlation coefficients  $r$  (number of observations, *See Table 03*).

**7.1.3) -The Coding Of Empirical Studies:** The coding of the selected empirical studies consists in performing a descriptive analysis of the study sample retained in the meta-analysis. The 80 relevant studies were classified according to the following variables:

**1- Their geographic location (by Country and by Continent):** We have identified: - *USA studies, UK studies, FR studies, others.* **2- From their years of publication:** we have identified: - *70s - 80s - 90s - 2000s - 2010s.* **3- Of their publication supports:** We have identified: - *journals - reviews - books - reports - Working Papers.* **4- Of their periods covered:** We have identified: - *less than 5 years - from 5 years to 10 years; - from 11 to 15 years - from 16 to 20 years - over 20 years.* **5- Their indicators for measuring employee ownership:** We have identified: - *EOBV (employee ownership binary variable) – EOCV (employee ownership continuous variable) - EOBCV (employee ownership binary and continuous variable) - EODIRECT / INDIRECT – DMAKING (decision making).* **6- And their indicators for measuring the performance:** We have identified: - *PERF FINAN - PERF ECONOM - PERF BOURS (stock market performance) - PERF FINAN ECONOM - PERF FINAN BOURS - PERF ECONOM BOURS - PERF FINAN ECONOM BOURS.*

**Table (03): Classification of studies by their different variables:**

<b>1- Classification of studies by Continents:</b>				
<b>continents</b>	<b>number of studies K</b>	<b>Percentages %</b>	<b>Samples of companies (N)</b>	<b>Percentages %</b>
North America	40	50%	37485	66,76%
Europe	29	36.25%	14085	25,1%
Asia	10	12.50%	4553	8,1%
Africa	1	1.25%	24	0,04%
<b>Total</b>	<b>80</b>	<b>100%</b>	<b>56147</b>	<b>100%</b>
<b>2- Classification of studies by their years of publication:</b>				
<b>Years</b>	<b>number of studies K</b>	<b>Percentages %</b>	<b>Samples of companies (N)</b>	<b>Percentages %</b>
1970	1	1.25%	98	0.17%
1980	13	16.25%	3628	6.46%
1990	24	30%	25974	46.26%
2000	28	35%	16330	29.10%
2010	14	17.5%	10117	18.01%
<b>Total</b>	<b>80</b>	<b>100%</b>	<b>56147</b>	<b>100%</b>
<b>3-Classification of studies by their publication supports:</b>				
<b>Publications</b>	<b>number of studies K</b>	<b>Percentages %</b>	<b>Sample of companies (N)</b>	<b>Percentages %</b>
journals	36	45%	31493	56,1%
reviews	16	20%	11888	21,2%
books	4	5%	1449	2,6%
reports	3	3,75%	843	1,5%
working papers	21	26,25%	10474	18,6%
<b>Total</b>	<b>80</b>	<b>100%</b>	<b>56147</b>	<b>100%</b>
<b>4 - Classification of studies by their periods covered:</b>				
<b>Periods Covered</b>	<b>Number studies (K)</b>	<b>Percentages (%)</b>	<b>Sample of companies (N)</b>	<b>Percentages (%)</b>
<b>Less than 5 years</b>	34	43 %	24787	44.15 %
<b>5 to 10 years</b>	29	36 %	14738	26.25 %
<b>11 to 15 years</b>	10	13 %	11075	19.72 %
<b>16 to 20 years</b>	4	5 %	930	1.66 %
<b>over 20 years</b>	3	4 %	4617	8.22 %
<b>Total</b>	<b>80</b>	<b>100%</b>	<b>56147</b>	<b>100%</b>
<b>5 - Classification of Studies by Indicators of Employee Ownership:</b>				
<b>Indicators of Employee Ownership EO</b>	<b>Number of studies (K)</b>	<b>Percentages (%)</b>	<b>Sample of firms (N)</b>	<b>Percentages (%)</b>
<b>EOBV</b>	43	53,75%	29918	53,3%
<b>EOCV</b>	15	18,75%	9783	17,42%
<b>EOBCV</b>	13	16,25%	13849	24,66%
<b>DMAKING</b>	3	3,75%	656	1,17%
<b>EODIRECT/EOINDIRECT</b>	6	7,5%	1941	3,45%
<b>Total</b>	<b>80</b>	<b>100%</b>	<b>56147</b>	<b>100%</b>
<b>6 – Classification of Studies by their Indicators of Performance (Accounting and Financial Data):</b>				
<b>Indicators of Performance</b>	<b>Number of studies (K)</b>	<b>Percentages (%)</b>	<b>Sample of companies (N)</b>	<b>Percentages (%)</b>
<b>PERF FINAN</b>	12	15%	13256	23,14%
<b>PERF ECONOM</b>	48	60%	26721	47,6%

PERF BOURS	5	6,25%	679	1,3%
PERF FIN ECO	6	7,5%	6753	12,02%
PERF FIN BOURS	3	3,75%	580	1,42%
PERF Eco BOURS	1	1,25%	229	0,4%
PERF FIN ECO BOURS	5	6,25%	7929	14,12%
PERF FINAN	12	15%	13256	23,14%
PERF ECONOM	48	60%	26721	47,6%
PERF BOURS	5	6,25%	679	1,3%
<b>Total</b>	<b>80</b>	<b>100%</b>	<b>56147</b>	<b>100%</b>

**Source:** Our elaboration.

Discussion of the results of the table:

**1- Classification of studies by Continents:** The majority of studies are American: 40 studies (or 50% of the studies) with a sample of 37485 companies (or 66.76% of the sample of companies). There are 29 European studies (36.25%) covering a sample of 14085 companies (25.1% of companies).

**2- Classification of studies by their years of publication:** The studies integrated into our meta-analysis are spread over a period of forty (40) years of research in employee ownership. Most of these studies were published between the 1990s and the 2000s (52 studies in total, or 65% of the study sample). The studies published in these two periods cover a total sample of 42304 companies (75.36% of the sample of companies). The period of the 1980s saw the publication of thirteen (13) studies (i.e. 16.25% of the study sample), most of which are American (6 studies), the rest are distributed between France (2 studies), United Kingdom (3 studies) and Germany (2 studies).

**3- Classification of studies by their publication supports:** Most of the selected studies are published in journals and reviews in the form of working papers: 73 studies in total (91.25%) of the study sample covering a sample of 53855 companies (95.9%). Books and reports are generally small percentages (5% and 3.75% respectively for the number of studies, and 2.6% and 1.5% for the number of companies).

**4 - Classification of studies by their periods covered:** The studies with periods covered less than 5 years represent 43% of the study sample (34 studies) and 44.15% of the sample of companies (24787 companies). Studies covering periods ranging from 5 years to 10 years represent 36% of the study sample (29 studies) with a sample of 14738 companies (or 26.25% of the sample of companies). Studies with periods covered between 11 and 15 years represent 13% of the total sample of studies (10 studies) covering a sample of 11075 companies (or 19.72% of the sample of companies).

**5 - Classification of Studies by Indicators of Employee Ownership:** more than half of the studies (43 studies or 53.75% of the studies) use the EOBV variable as the main indicator estimating the effect of employee ownership on the performance, these studies were carried out using a sample of 29918 companies (i.e. 53.3% of the sample of companies). The studies using the variables EOCV (15 studies) and EOBCV (13 studies) become in second and third place respectively (18.75% and

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16.25% of the study sample), with samples from 9783 and 13849 companies respectively (17.42% and 24.66% of the sample of companies). **6-Classification of Studies by their Indicators of Performance:** the economic performance of the firm: PERF ECONOM is the most covered by studies (48 studies or 58.75% of studies on a sample of 26721 companies, or 47.6% of companies) whose productivity is the most examined sub-indicator (41 studies, i.e. 51.25% of studies with 22618 companies, or 40.28% of companies). Financial performance is the second indicator examined by empirical studies (12 studies represent 13.75% of the study sample), these studies cover a sample of 13256 companies (23.14% of companies).

**7.2. Meta-Analysis and Regression Meta-Analysis, Results and Discussion:**

**7.2.1.Three Meta-Analyzes For Three Different Methodologies:** the results of the 80 empirical studies used in our meta-analysis are divided into three very distinct types of research methodologies: **There are the comparative empirical studies:** We identified (16) comparative studies including 24 exploitable results. **Then we find the evolutionary studies:** In total, we identified (23) studies including 34 exploitable results. **Finally, there are the longitudinal studies:** that represent the largest number of studies. There are 41 longitudinal studies selected in our meta-analysis with 59 exploitable results.

**7.2.2. Calculation of Effect Sizes of different Selected Studies:**

**Table (04): the 117 effect sizes calculated from the 80 studies selected:**

Studies	Years	Countries	Samples	T student	r	Studies	Years	Countries	Samples	T student	r
Conte & Tannenbaume	1978	USA	98	1,22	0,54	Kalmi & al	2005	Europe	661	0,58	0,022
Livingston & Henry	1980	USA	102	-1,56	-0,154	Faleye & al.	2005	USA	2114	-0,086	-0,001
cable & fitzroy	1980	Germany	126	1,43	0,131	Faleye & al.	2013	USA	3121	0,0224	0,0004
Jones 1982,	1982	UK	146	-2 ,35	-0,05	Zhou.X, & Zing.X	2011	China	750	0,56	0,020
Rosen & Klein	1983	USA	43	1,86	0,037	Zhou.X, & Zing.X	2011	China	750	0,25	0,009
GAO 1987	1987	USA	222	3,76	0,05	Zhou.X, & Zing.X	2011	China	750	1,88	0,068
Estrine & al. (a) France:	1987	UK	500	2,2	0,099	Zhou.X, & Zing.X	2011	China	750	-0,78	-0,028
Estrine & al. (b) Italie:	1987	UK	150	5,158	0,402	Zhou.X, & Zing.X	2011	China	750	-0,48	-0,017
Estrine & al. (c) UK	1987	UK	50	1,088	0,173	Brent. K	2008	USA	300	-0,84	-0,049
Kroumova & al	2002	USA	3961	10,142	0,159	Fakhfakh & al.	2012	France	604	-1,02	-0,041
Kroumova & al.	2002	USA	3961	2,903	0,046	Ngambi& Oulume	2013	Cameroun	24	-5,254	-0,761
Kroumova & al.	2002	USA	3961	-2,66	-0,042	Kalmi & al	2005	Europe	661	0,58	0,022
&Raschle Gr	2004	Germany	535	-0,4	-0,017	Faleye & al.	2005	USA	2114	-0,086	-0,001
<b>B)- Evolutionary Studies</b>											
Studies	Years	Countries	Samples	T student	r	Studies	Years	Countries	Samples	T student	r
Defourny & al. (a)	1985	France	550	1,885	0,081	Core & Guay	2001	USA	756	-0,92	-0,033

Defourny & al. (b)	1985	France	550	4,09	0,173	caby & hirigoyen	2002	France	109	1,707	0,169
FitzRoy & Kraft (a)	1986	Germany	123	3,56	0,265	Kruse & al. (a)	2004	USA	14	-0,471	-0,175
FitzRoy & Kraft (b)	1987	Germany	123	2,96	0,310	Kruse & al. (b)	2004	USA	14	2,414	0,674
Jones	1987	UK	50	-2,09	-0,324	D'Arcimoles & Trébucq	2004	France	221	2,538	0,173
Conte & Svejnar	1988	USA	40	-4,704	-0,639	D'Arcimoles & Trébucq	2004	France	221	1,97	0,135
Conte & Svejnar	1988	USA	40	-4,083	-0,585	D'Arcimoles & Trébucq	2004	France	221	2,531	0,172
Conte & Svejnar	1990	USA	155	-0,363	-0,03	Sesil & Kroumova	2005	USA	312	6,209	0,336
Jones & Kato	1993	Japan	320	2,647	0,146	Sesil & Kroumova	2005	USA	312	2,375	0,135
Jones & Kato	1993	Japan	543	1,355	0,058	Sesil & al.	2005	USA	490	8,97	0,378
Jones	1993	Poland	63	0,682	0,09	Sesil & al.	2005	USA	490	6,33	0,277
Mehran	1994	USA	153	2,571	0,208	Sesil & al.	2005	USA	490	0,99	0,045
Mehran	1994	USA	153	2,642	0,214	McHugh & al.	2005	USA	68	1,655	0,217
Welbourne & Cyr	1999	USA	107	0,23	0,023	Kalmi & al	2005	&Finl	136	-0,74	-0,066
McNabb & Whitfield	1998	UK	657	2,369	0,092	Fich & Shivdasani	2005	USA	1000	2,014	0,064
McNabb & Whitfield	1998	UK	551	0,575	0,024	Fich & Shivdasani	2005	USA	1000	1,887	0,069
Conyon & Freeman	2001	UK	299	1,837	0,106	Robinson & Wilson	2006	UK	93	0,698	0,03
<b>C)- Longitudinal Studies</b>											
Studies	Years	countries	Samp les	T student	r	Studies	Years	Countrie s	Samples	T student	r
Jones & Svejnar	1985	Italy	633	3,267	0,13	Iqbal & Hamid	2000	USA	149	2,44	0,201
Blanchflower & Oswald	1988	USA	948	-0,616	-0,02	Sesil & al.	2002	USA	229	5,98	0,371
Lee	1989	Sweden	150	-1,325	-0,08	Sesil & al.	2002	USA	229	2,325	0,153
Mitchell & al. (a)	1989	USA	495	2,146	0,1	Sesil & al.	2002	USA	229	2,5	0,165
Mitchell & al. (b)	1989	USA	495	2,101	0,095	Kato & Morishima	2002	Japan	126	2,55	0,227
Mitchell & al. (c)	1989	USA	495	1,856	0,084	Tseo & al	2004	China	55	1,949	0,273
KUKse	1992	USA	2976	1,088	0,02	Park & al.	2004	USA	477	3,898	0,177
Estrin & Jones	1992	France	541	3,528	0,152	D'Art & Turner	2004	EU	2827	4,58	0,031
KUKse	1993	USA	500	0,223	0,01	D'Art & Turner	2004	EU	2827	1,743	0,070
Kumbhakar & Dunbar	1993	USA	891	2,697	0,09	Sesil & Lin	2005	USA	291	12,01	0,586
Cooke	1994	USA	841	1,54	0,12	Holl&ts & GEUdri	2007	France	150	-2,742	-0,222
Park & Song	1995	USA	232	2,00	0,131	KUKse & al	2008	USA	14	2,5	0,714
Park & Song	1995	USA	232	4,2	0,27	Jones & al.	2010	finland	398	1,75	0,089
Park & Song	1995	USA	232	4,58	0,291	Lee H-C & al.	2009	Taiwan	32	5,31	0,721
Jones & Kato	1995	Japan	109	1,091	0,104	Mahoney & He. J	2009	USA	211	-0,05	-0,003
Craig & Pencavel	1995	USA	34	1,102	0,203	Kato & al.	2010	Koria	200	-1,527	-0,108
Borstadt & Zvirlein	1995	USA	85	-0,586	-0,068	Bryson & Freeman	2010	UK	578	2,36	0,1
Borstadt &	1995	USA	85	1,051	0,122	KUKse &	2011	USA	780	2,17	0,078

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Zwirlein						al.					
Conte & al.	1996	USA	9040	10,206	0,106	Kim & Ouim	2014	USA	410	1,97	0,1
Blasi & al.	1996	USA	4738	2,07	0,030	Poulain-Rehm	2015	France	131	0,527	0,048
Blasi & al.	1996	USA	4738	1,21	0,017	Gherghina & Vintilă	2015	romania	198	-2,642	-0,2
Blasi & al.	1996	USA	4738	1,686	0,024	Richter & Schrader	2016	Europe	1115	3,754	0,112
Blasi & al.	1996	USA	4738	1,11	0,016	Richter & Schrader	2016	EU	1115	6,444	0,2
Blasi & al.	1996	USA	4738	2,16	0,031	Richter & Schrader	2016	EU	1115	19,76	0,511
Smith & al.	1997	Slovenia	1545	1,584	0,040	Kato & al.	2016	Japan	1613	10,404	0,252
Ohkusa & Ohtake	1997	Japan	805	2,909	0,102	Kato & al.	2016	Japan	1613	10,473	0,253
Cole & Mehran	1998	USA	486	-2	-0,91	Kato & al.	2016	Japan	1613	8,869	0,216
B&hel & al	1998	USA	425	0,1	0,005	Braam & Poutsma	2017	Netherlands	195	-2,7	-0,2
Murphy. K	1999	USA	177	-0,6	-0,046	Braam & Poutsma	2017	Netherlands	195	-3,03	-0,218
<b>Total</b>						Braam & Poutsma	2017	Netherlands	195	-1,26	-0,01
						empirical studies in 17 countries with a sample of 56147 companies & 117 partial correlation coefficients or observations					

**Source:** calculated from studies using *CMA* program (Comprehensive Meta-Analysis) version 03.

We note at the first reading of this table: - that 88 effect sizes out of 117 highlight a positive relationship between employee ownership and performance, the other effect sizes (29 out of 117) show a negative link. The largest effect size is (+ 0.721) and the largest negative effect size is (-0.910). Thus, if the calculation of a common effect size (common metric) makes it possible to compare studies between them, it does not, in fact, make it possible to resolve the problem of the intensity of the relationship between employee ownership and performance.

**7.2.3. Results of the Meta-Analysis of Comparative, evolutionary and longitudinal Studies:**

**Table(05):Results of the meta-analysis of the comparative, evolutionary and longitudinal studies:**

<i>Parameter</i>	<b>Comparative studies</b>	<b>evolutionary studies</b>	<b>longitudinal studies</b>
<i>Original study sample (K)</i>	16	23	41
<i>Original sample sizes (n : nمبر of companies in study)</i>	13507	6810	35830
<i>Number of partial correlation coefficients r</i>	24	34	59
<i>Range of partial correlation coefficients r</i>	-0.761 to +0.54	-0.639 to +0.674	-0.91 to +0.721
<i>Sum of company samples (N)</i>	24429	10424	65452
<i>Range of sample sizes</i>	24 to 3961	14 to 1000	14 to 9040
<i>Unweighted effect size</i>	0,026	0,0084	0,134
<b><i>Weighted average effect size: <math>\bar{r}</math></i></b>	<b>0,031</b>	<b>0,112</b>	<b>0,08</b>
<i>Variance observed</i>	0,0071	0,015	0,017
<i>Variance related to sampling error</i>	0,001	0,0031	0,0008

<i>Residual variance (corrected)</i>	0,0061	0,012	0,0162
<i>(1) 95% Confidence Interval</i>	[0.019 to 0.042]	[0.095 to +0.129]	[0.072 to +0.087]
<i>%(2) of variance related to sampling error</i>	14,08%	20.66%	4.70%
<i>Khi-2 homogeneity test (3)</i>	173,78 ** ** <i>p</i> <0,05	168,60** ** <i>p</i> <0,05	1127.06 *** <i>p</i> <0. 1
<i>ddl</i>	( <i>ddl</i> = 23)	( <i>ddl</i> = 33)	( <i>ddl</i> = 58)

**Source: CMA v.03 results.**

The table above clearly shows: That the average effect sizes of employee ownership on performance for the three methodologies are almost positives respectively: (comparative studies:  $\bar{r} = 0.031$ , evolutionary studies:  $r = 0,112$ , longitudinal studies:  $r = 0.08$ ); The effect sizes are almost significant (the 95% confidence intervals not including zero: comparative studies: **95% CI = [0.019 to 0.042]**, evolutionary studies: **95% CI = [0.095 to 0.129]**, longitudinal studies: **95% CI = [0.072 to +0.087]**). Indeed, the results of the statistical calculations assume a strong heterogeneity of the studies selected in view of the value of the residual variance which represents (86%> 25%, 79.34%> 25%, 95.3%> 25%) with a highly significant Khi-2 tests (**173,78, 168,60, 1127.06**). The interpretation of these first results then leads to continue the meta-analysis by looking for moderating variables.

**7.3. In Search of Moderator Variables: Regression Meta-Analysis:**

The following moderating variables are therefore retained in the regression meta-analysis: **countries studied (place of study):** American, British and French studies versus "the rest of the world". **Publication years:** (the 1990s, the 2000s and the 2010s). **Periods covered:** periods covered less than 5 years, and from 5 years to 10 years. **Publication supports:** journals, working papers and scientific reviews. **Indicators of employee ownership:** we retain: EOBV, EOCV and EOBCV. **Indicators for measuring the performance:** we retain:PERF ECONOM and PERF FINAN. In the table below, we synthetize all of these moderating variables, their definitions and their assigned measures in our econometric regression model:

**Table (06): presentation of the moderating variables of the regression meta-analysis:**

Definition Of Variables	Coding	Measures
<b>1)- Dependent Variables</b>		
Partial Correlation Coefficients	<i>r</i>	Continuous variables
<b>2)- Independent Variables</b>		
<b>2-1)- Countries studied</b>		
2-1-1) - American Studies	USA Studies	Variable dummy : yes = 1, if not = 0
2-1-2)- British Studies	UK Studies	Variable dummy : yes = 1, if not = 0
2-1-3)- French Studies	FR Studies	Variable dummy : yes = 1, if not = 0
<b>2-2)- Publication years</b>		
2-2-1)- 1990 publications	90s	Variable dummy : yes = 1, if not = 0
2-2-2)- 2000 publications	2000s	Variable dummy : yes = 1, if not = 0
2-2-3)- 2010 publications	2010s	Variable dummy : yes = 1, if not = 0

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2-3)- Periods Covered		
2-3-1)- periods less than 5 years	less than 5 years	Variable dummy : yes = 1, if not = 0
2-3-2)- periods from 5 to 10 years	5 to 10 year	Variable dummy : yes = 1, if not = 0
2-4)- Publication Supports		
2-4-1)- Journals	Journals	Variable dummy : yes = 1, if not = 0
2-4-2)- Reviews	Reviews	Variable dummy : yes = 1, if not = 0
2-4-3)- Working Papers	Working Papers	Variable dummy : yes = 1, if not = 0
2-5)- Indicators Of Employee Ownership		
2-5-1)- EO Binary Variable	EOBV	Variable dummy : yes = 1, if not = 0
2-5-2)- EO Continuous Variable	EOCV	Variable dummy : yes = 1, if not = 0
2-5-3)-EO Binary and Continuous Variable	EOBCV	Variable dummy : yes = 1, if not = 0
2-6)- Indicators Of Performance		
2-6-1)- Economic Performance	ECONOM PERF	Variable dummy : yes = 1, if not = 0
2-6-2)- Financial Performance	FINAN PERF	Variable dummy : yes = 1, if not = 0

**Source:** *CMA v.03 results.*

Our analysis was carried out using data from our database containing 80 empirical studies around the world dealing with the relationship between employee ownership and performance.

**Table (07): Synthesis of the results of regression meta-analysis**

Description	Comparative Studies	Evolutionary Studies	Longitudinal Studies
<b>Impact of moderating variables:</b>			
<b>1- Countries studied</b>			
USA	<b>0.038</b>	<b>0.120</b>	<b>0.048</b>
UK	<b>0.131</b>	<b>0.055</b>	<b>0.1</b>
FR	<b>-0.041</b>	<b>0.141</b>	<b>0.148</b>
<b>2- Publication years</b>			
90s	/	<b>0.081</b>	<b>0.041</b>
2000s	<b>0.042</b>	<b>0.13</b>	<b>0.107</b>
2010s	<b>-0.00037</b>	/	<b>0.21</b>
<b>3- Periods Covered</b>			
less than 5 years	<b>0.05</b>	<b>0.097</b>	<b>0.13</b>
5 to 10 year	<b>0.0207</b>	<b>0.150</b>	<b>0.021</b>
<b>4- Publication Supports</b>			
Journals	<b>0.071</b>	<b>0.13</b>	<b>0.06</b>
Reviews	<b>0.013</b>	<b>0.027</b>	<b>0.04</b>
Working Papers	<b>-0.007</b>	<b>0.097</b>	<b>0.205</b>
<b>5- Indicators Of Employee Ownership</b>			
EOBV	<b>0.039</b>	<b>0.108</b>	<b>0.083</b>
EOCV	<b>0.17</b>	<b>0.150</b>	<b>0.152</b>
EOBCV	<b>0.17</b>	<b>0.093</b>	<b>0.056</b>
<b>6- Indicators Of Performance</b>			
ECONOM PERF	<b>-0.011</b>	<b>0.089</b>	<b>0.078</b>
FINAN PERF	<b>0.055</b>	<b>0.113</b>	<b>0.066</b>

**Source:** *CMA v.03 results.*

All of the results presented in the table above have shed light on the effect of employee ownership on performance. This effect has been studied through:

- Our empirical results show a positive and statistically significant effect of employee ownership on performance, the average effect size:  $\bar{r} = 0.074$  (**hypothesis H1 validated**);
- Our results show that the companies with

employee ownership obtaining better performances compared to those which do not have it, the average effect size:  $\bar{r} = 0.031$ , the effect is positive and statistically significant (**hypothesis H2 validated**); - Our results show that the adoption of employee share ownership plans increases the performance of companies, the effect of employee ownership on performance  $\bar{r} = 0.112$ , the effect is positive and statistically significant (**hypothesis H3 validated**); - The results of our meta-analysis show that the duration of the existence of employee ownership positively and significantly affects the firm performance, the effect of employee ownership on the performance  $\bar{r} = 0.08$  (**hypothesis H4 validated**).

### **8. Conclusion:**

Our article contributes in various ways to the development of knowledge in the field of employee ownership. The majority of research work mobilized in our work attributes to employee ownership a positive effect on performance. This conclusion is valid as well in the case where we consider performance under all its meanings financial, economic and stock market, only in its social dimension. In the first case, we have indeed analyzed the literature which measured performance through employee productivity, financial profitability and stock market profitability. In the context of our meta-analysis, we particularly highlighted the four axes around which the meta-analytical approach revolves. These are: - The constitution of an empirical corpus (the database) through an informed selection of published and unpublished studies. We retained 80 studies. - The quantification of the relation "employee ownership - performance" by using the estimation of the partial correlation coefficient. Examination of the database allowed us to estimate this coefficient for 117 partial correlation coefficients distributed as being:

- 24 empirical investigations for comparative studies;
- 34 other empirical investigations for evolutionary studies;
- And 59 empirical investigations for longitudinal studies.

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