Measurement of the relationship of human capital with the performance of the Algerian company
-Study on a sample of 50 largest Algerian companies-

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قياس علاقة رأس المال البشري بأداء المؤسسة الجزائرية
– دراسة على عينة من أكبر50 شركة جزائرية–

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Abstract: Today, the term "human capital" is widely used when talking about the key success factors of an organization. This paper aim focuses on three main areas. First, we try to specify the general framework of the concept of human capital in its various components and parts. Then, we are interested in its quantification and the quantification of its outline by means of the accounting and financial means available in the Algerian context. Finally, emphasis will be placed on studying the influence of this human component of intangible wealth and the performance of a sample made up of a panel of 50 largest Algerian companies rolled over a period of 4 years.

Keywords: human capital, competence, training, performance.

Jel Classification Codes : B23, C02, J31

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الملخص: أصبح مصطلح "رأس المال البشري" يستخدم مؤخرا على نطاق واسع عند الحديث عن عوامل النجاح الرئيسية للمنظمة. تطمح دراستنا الى تحقيق ثلاثة أهداف رئيسية. نحاول أولاً تحديد الإطار العام لمفهوم رأس المال البشري بمختلف مركباته وأجزائه. ثم نقوم بتوجيه اهتمامنا الى التقدير الكمي لهذا النوع من رأس المال وتحديد ملامحه من خلال الوسائل المالية والمحاسبة المتاحة في النظام الجزائري. أخيرًا، سيتم التركيز على دراسة العلاقة بين هذا المكون البشري للثروة غير الملموسة وأداء عينة مكونة من أكبر 50 شركة جزائرية على امتداد 4 سنوات.

الكلمات المفتاحية: رأس المال البشري، المهارات ، التدريب ، الأداء.

تصنيفات جل:B23, C02, J31

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INTRODUCTION

Today, investment is no longer limited to the acquisition of land, buildings or machinery, but increasingly includes sales teams, teams of engineers and designers or knowledge in the form of patents or the results of intense research. In a world that is becoming dematerialised, the evolution of developed societies shows that the intellectual share of human activity is increasing compared to traditional manufacturing activities. Increasingly, production processes make use of accumulated knowledge as much, if not more, than of tools.

At a time when the entry into a knowledge-based economy is becoming more and more obvious to everyone, the expression "human capital" has almost become a motto for many management consultants. The new awareness of its strategic importance in the minds of business leaders has inevitably led to a large literature on the subject and to skilful marketing. From die-cut advertising formulas to the most fanciful exploitations, the theme of human capital has also given rise to the most serious approaches. An opportunity to take stock of a concept that dates back more than fifty years.

Traditionally, specialists define four factors of production. The first factor; land, the labour factor (labour) and capital, i.e. assets. Finally, the fourth factor is the 'corporate' - what John Maynard Keynes called the 'animal spirits' - the spirit of initiative that turns barren land into a factory. Back to the labour factor. With a few exceptions, economists originally thought of workers as an indistinct mass: as long as they were able and willing to do physical work, their knowledge and skills didn't matter. Adam Smith was of a different view: what fuels economic activity is not the mass of workers, but "the useful talents acquired by the inhabitants or members of society". Acquiring these talents and skills, he added, comes at a cost to the individual, but once acquired, they constitute "capital fixed and realised, so to speak, in the person". With new organisations seeking sustainable development, the stakes are high. It is a question of bringing the labour factor and performance criteria into harmony. Work is not just a cost, it is also a factor of added value, innovation, competence and quality, where success can be achieved in the long term.

Even if these themes are at the heart of many discussions today, the issues remain unresolved. Indeed, few models are proposed and empirical studies often lack precision. Several explanations can be put forward. First of all, the difficulties in obtaining relevant data on sensitive areas such as ecology and human resources (HR) reinforce these situations. Secondly,

causal relationships are sometimes difficult to establish, and work ends up being confined to descriptive states. Thus, it must be noted that very little Algerian research addresses this type of problem.

Moreover, for the few existing works, the analyses adopted are very different: a first group of research focused on the social policy of the firm as a whole, while a second deals with wage policy and a third approaches human resources performance through a scoreboard. At the end, although these contributions are very rich, it seems difficult to compare them. This scarcity of existing research and its weak complementarity is particularly damaging. Indeed, filling these gaps, even if only partially, would theoretically improve our understanding of the links between human capital and company performance.

Our research, which takes place in an Algerian context that is different from the other contexts already studied, aims to fill the gap in the empirical work that has dealt with this topic, as the Algerian economy is still an unexplored area in the evaluation of the effects of human capital on business performance and economic growth.

This work will make it possible to answer the question: "Is there a significant link between human capital and the performance of Algerian firms?".

The response to our problem will be organised around three parts. In the first part, we will attempt to define the theoretical framework of our research. In order to do so, we will address several reflections on the human capital of the company, from an economic, accounting and managerial point of view. After having discussed the conceptual field, we will focus on the problematic of the relationship between human capital and the performance of the company by talking about the different approaches concretized by empirical studies with distinct results. In a second part, we specify the methodology of our research carried out on a sample of Algerian companies. This part will be followed by a detailed and in-depth presentation of the results of our hypotheses test. The conclusion will highlight the limits of this study, the promising avenues of research, as well as the various theoretical and managerial implications.

1. Identification and theoretical framework of Human capital

At a time when the entry into a knowledge-based economy is becoming increasingly obvious to everyone, the expression "human capital" has almost become a motto for many management consultants. The new awareness of its strategic importance in the minds of business leaders has inevitably led to a large literature on the subject and to skilful marketing.

1.1. Evolution of the "human capital" concept in literature and its relationship with company performance

At a time when the entry into a knowledge-based economy is becoming increasingly obvious to everyone, the expression "*human capital*" has almost become a motto for many management consultants. As with many fundamental ideas, it is difficult to attribute the concept of human capital to a single author. It has been steadily growing over the last half century. It has been successively considered from an economic point of view with the works of (MARSHALL, 1971), (SCHULTZ, 1961, pp. 1-17), (BECKER, 1964) and (BECKER, 1993, p16), an accounting angle with the contributions of (Hermanson, 1964) then managerial angle with the work of (BOUNFOUR, 1998), (EDVINSSON and MALONE 1997), (KAPLAN and NORTON, 1996), FITZ-ENZ (FITZ-ENZ, 2000) and (STIGLITZ and al, 2007, p109).

Only the Vinci industrial group uses a precise definition, considering human capital as "the totality of knowledge, skills, competencies, and individual characteristics that facilitate the creation of personal, social and economic well-being. It is an intangible asset that can enhance or sustain productivity, innovation and employability" (OECD, 2011).

The issue of the relationship between human capital and company performance can be approached from several angles, depending on the field studied. However, empirical work in this field is particularly rare. Indeed, two difficulties are to be circumvented: to apprehend human capital and to bring it closer to an economic performance indicator.

Correlation studies between social policy and economic performance show, in general, a positive association. However, comparing them remains difficult because each of them uses different social indicators.

(Denison, 1984, pp4-23) conducted research on 34 companies in several industrial sectors. The social data were taken from questionnaires (processed at the University of Chicago) and relate mainly to decision-making, work organisation and the degree of involvement. The economic variables are accounting variables: return on assets (net profit/assets) and commercial profitability (net profit on turnover). It is interesting to note that the author carries out a dynamic analysis by studying the correlation between social data from date t and financial data from t to t+5.

(Schuster, 1988, pp65-68) conducted a study of 1300 enterprises. The author's objective was to test the relationship between economic performance measured by return on equity and "active" human resource management, i.e. having an individualised remuneration policy, profit-sharing, personalization

of objectives, flexible working hours and the practice of internal consultation. The relationship established is weak but positive.

Using an exclusively quantitative methodological approach and on a sample of 48 Canadian SMEs active in the field of consulting engineering, (Lise Chrétien et al, 2005) demonstrated the positive effects that the use of certain HRM practices can have on the overall efficiency of companies in the project management sector.

(Stephen Gates and Pascal Langevin, 2010, pp125-138), based on an empirical, quantitative and qualitative study, their results show that performance is correlated with the level of implementation of human capital indicators. Human capital measurement systems effectively help organizations to measure and better manage their performance. The results also confirm the desire of HR managers to implement human capital indicators that are consistent with their company's strategy.

1.2. Measurement of human capital

In the age of the knowledge society, traditional accounting has a structural defect because knowledge and skills are not represented. The lack of a quantitative approach to human resources, other than in terms of budget or expenses, is a shortcoming that human resources accounting can help to correct. Such accounting offers alternatives to current financial accounting in order to integrate intangible assets, such as knowledge and skills (PASSEROTTI, 2011).

Among these alternatives is the historical cost method, which is profiled by the work of Edmond Marques. This author recognizes five types of costs related to knowledge and skills that could be capitalized (MARQUES, 1974). These are the various costs relating to recruitment, training, integration, transfer and organisational costs. The calculation of the depreciation of investments thus capitalised takes into account six factors: the lifespan of individuals, the quality of their health during their working life in the company, the legal or contractual retirement age, the probability of leaving the company before retirement age or the end of the contract, the obsolescence of technical and professional knowledge and, finally, the social climate specific to the company and in which the individual lives ((MARQUES, 1974).

Human capital is also evaluated using the replacement cost method, which measures what human resources would cost today. Here too we shall refer to the work of E. Marques, who stresses that replacement costs vary in particular with the reasons for replacement (due to the enterprise, due to the employee or beyond the control of the enterprise and the employee), the

nature of the replacement (internal change or external recruitment) and the period of vacancy (opportunity cost) (MARQUES, 1974).

There is also a valuation method based on an economic approach that measures human resources in terms of what they will bring in. B. Lev and A. Schwartz define human capital as a source of income whose value is the present value of future earnings adjusted by a discount rate specific to the holder of the source. However, human capital differs from physical capital because it evolves in a more uncertain environment, where there is no market to refer to. To evaluate the human capital of the firm they suggest to classify the employees in homogeneous groups according to their qualification and their age group, then to define the average wage profile per group and finally to calculate the present value of its wages to define the present value of human capital. The discount rate will be the rate used in capital budgets. The accounting recording of human capital would be done according to the long-term leasing model and it would be on the asset side in return for a debt (present value of wages) (LEV & SCHWATRZ, 1971).

2. Methodology of the empirical study measuring the relationship of human capital with the performance of Algerian companies

The heterogeneity of intangibles, especially human capital, and the diversity of approaches to this concept make our statistical knowledge of the different intangible flows, which financial accounting represents in its profit and loss accounts, very modest. For this reason, this paper aims to fill an obvious gap at the statistical level in the measurement of human capital, because in Algeria, few figures of micro-economic origin are available for the human assets' evaluation of the company . However, and in the aim of sowing a particular interest in intangibles, we shall try despite the lack of information to draw an outline, moreover, slight it may be, of the human' wealth of the Algerian company in order to measure its impact on performance with its various aspects. A positive impact will objectively encourage the company's decision-makers to invest more in the human aspect.

2.1 Notions on the phenomenon to be explained: company performance

In the field of management, performance has always been an ambiguous notion, rarely defined explicitly. Burgundy defines it "as the achievement of organisational objectives, whatever the nature and variety of these objectives. This achievement can be understood in the strict sense (result, outcome) or in the broad sense of the process that leads to the result (action)....". (BURGUNDY, 2000). For Lebas, performance only exists if it

can be measured, and this measurement can in no way be limited to the knowledge of a result. Therefore, the results achieved are evaluated by comparing them with desired results or benchmarks. In this context, performance assessment can be likened to "benchmarking" (BOUQUIN H, 2004).

Managers often distinguish between three types of performance (CABY et al, 1999): efficiency, measured by the ratio between the resources used by the company and the results; effectiveness, which reflects the quality of the anticipations made by the decision-making managers, and is measured by the gap between the targeted objectives and the results obtained. This performance measure also makes it possible to take into consideration elements such as quality, which the notion of efficiency leaves aside, and finally, relevance, which reflects the level of adequacy between the stated objectives and the context in which it is found.

In this work, the type of data analysed and the econometric tool applied led us to use accounting performance indicators to measure the performance of large Algerian companies. These indicators are:

- ✓ Financial profitability, which is calculated by the ratio between net profit and equity;
- ✓ Economic profitability, which measures the profitability of economic assets by relating operating profit to total assets;
- ✓ Commercial profitability measured by the ratio of net profit to turnover;
- ✓ Production for the financial year;
- ✓ Added value;
- ✓ Gross operating surplus;
- ✓ Operating profit;
- ✓ Net profit.

2.2. Presentation of the explanatory variable: human capital

On 9 April 2012, the Society for Human Resource Management (SHRM), under the approval of the American National Standards Institute (ANSI), published a standard entitled "an American National Standard for Human Resource Management" containing a number of proposed indicators for human resource management. Recognizing that the financial value of human capital is insufficiently addressed in investment communications, this document consists of several standards designed as a set of analytical measures that will reflect the value of a company's human wealth. This metric is not perfect. However, it is practical, useful and reasonable.

Inspired by this US standard, the Scoreboard proposed in this research paper is made up of a number of indicators selected for the assessment of human capital investment and not human capital in absolute

terms. This has always been rejected by the accounting and financial standard-setter. Indeed, the approach adopted for the measurement of this investment will be the cost approach based on the idea that the asset is worth what it cost. This involves breaking down the investment in human capital into the stages of the relationship between the company and its employees. Indeed, the organization must first invest these funds through recruitment expenses to optimize the selection of its employees in order to maximize the expected return on this relationship (CIG, 2011). Then, it must determine the appropriate level to remunerate this human capital by reflecting on the best compensation policy. Once the investment has been put in place, thought must be given to its continuous updating in order to avoid its degradation. This is where training expenditure comes in. But, between the acquisition and maintenance of any investment, it is imperative to ensure a minimum of pre-requisites for the proper functioning of this vital asset. We are talking here about human capital support expenditure.

The value of the investment in human capital is obtained by summing all the expenditure made by the company in the context of these four operations. To do this, it was necessary to scan the entire nomenclature of accounts of the financial accounting system applied in Algeria in order to be able to draw from it those which have a relationship, however slight it may be, with the four categories of expenditure constituting the human capital of the Algerian firm.

The results obtained from this exercise are summarised in Table N°1.

Table (01): Expenditure on Human Capital

Human capital expenditure category	Appropriate accounting links
Recruitment	621X : Staff outside the company, Recruiters ; 622X : Remuneration of intermediaries and Recruiters' fees ; 625X: Travel, missions and receptions for Recruitment.
Remuneration	631: Staff remuneration and other ; 641: Taxes and similar payments on remuneration
Support	613Y : Rental charges for staff accommodation ; 614Y : Co-ownership charges for staff housing; 624Y: Staff transport ; 635Y: Contributions to social organisations for the interest of staff; 637: Other social security charges ; 638Y: Other staff support charges ;
Training and	618Z: Training and development documentation;

Development	622Z: Remuneration of intermediaries and trainers' fees ;
	625Z: Travel, missions and receptions for training ;
	638Z: Other expenses related to training and development.

Sources: Produced by the authors on the basis of the Algerian Accounting and Financial System

1.3. Research hypotheses

After having been largely confirmed in several empirical studies, our research will attempt to verify the impact of human capital on the performance of Algerian companies with the three components: economic performance, financial performance and commercial performance. To this end, we put forward the research hypotheses as follows :

H1: "*Human capital is positively related to the business performance of Algerian companies*" ;

H2: "*Human capital is positively related to the financial performance of Algerian companies*".

H3: " *Human capital is positively related to the economic performance of Algerian companies* ".

2.4. Work sample

Our research was carried out on the basis of the population of companies that are members of the National Commercial Registry Centre (NCRC) and are subject to corporate tax. The sample studied is a 4-year panel [2010-2013] of 50 large Algerian companies, i.e. 200 observations (company years). These are raw data taken from the balance sheets and profit and loss accounts of the corporate accounts. The economic phenomena and concepts proposed in the study are approached by accounting variables; the objective being to analyse the behaviour of large Algerian companies in terms of investment in human capital and accounting practices, and to measure, moreover, the impact of the various components of this type of investment on their performance.

The sample of our research can be broadly described by the following characteristics:

➢ Private companies make up half of our sample and the other half is approximately equally divided between state-owned companies and multinational companies.

➢ The large Algerian companies in our sample take only one of two legal forms: SPA or SARL. Joint stock companies occupy a segment exceeding three quarters. The limited liability companies are generally family businesses that operate from father to son.

➢ Our working sample is rich in industrial companies, which occupy a proportion of 60%. The service sector takes up a quarter of the sample, followed by the trade sector with a proportion of only 14%.
➢ As for the areas of activity of the three sectors, we can cite them as follows:
   • The industry sector: construction, public works, agri-food, electronics, pharmaceuticals, etc.;
   • The trade sector: cars, supermarkets, etc;
   • The service sector: hotels, press, insurance and telecommunications.

This distribution is only the result of a random choice respecting the criterion of the size of the company and the availability of data within the NCRC.

3.Results of the descriptive study of the phenomenon studied "human capital".

The heterogeneity of intangibles and the diversity of approaches to this concept make our statistical knowledge of the different intangible flows, which financial accounting represents in its profit and loss accounts, very modest. For this reason, this paragraph aims to fill an obvious gap, at the statistical level, in the measurement of human capital, since in Algeria, few figures of micro-economic origin are available for the evaluation of the intangible assets of the enterprise. Indeed, and for reasons of lack of accounting data displayed in the corporate accounts of the companies in our sample, the measurement of investment in human capital (HC) will be through account 63 "Staff costs". This accounting heading covers all expenses incurred by the company in the context of employee remuneration. It is a flow of wealth that the firm pays to maintain its human capital.

3.1. Evolution of human capital over the study period

This paragraph aims to focus on the evolution of human capital investment in the firms in our sample in an aggregate manner.

Table (02): Evolution of the human capital of Algerian firms over the period studied

Overall evolution of HC	8.22%	8.75%	8.27%	9.60%

Source: Prepared by the authors based on working sample data

The study of the evolution of the ratio measuring the weight of human capital in the turnover showed a stability of the expenses incurred by the large companies in our sample over the period studied. The investment of Algerian

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companies in terms of human capital did not even reach one third of their annual production.

3.2. Share of human capital in the added value of Algerian companies
The focus here is on the distribution of added value over the five partners of any company:
- ✓ The share of personnel measured by the ratio "personnel costs/added value";
- ✓ The share of lenders measured by the ratio "financial charges/value added";
- ✓ The share of the State measured by the "Taxes and taxes/value added" ratio;
- ✓ The share of self-financing measured by the "depreciation and amortisation charges and provisions/value added" ratio;
- ✓ The shareholders' share measured by the "net profit/value added" ratio.

Figure (01): Distribution of revenues generated by the sampled companies over the different partners
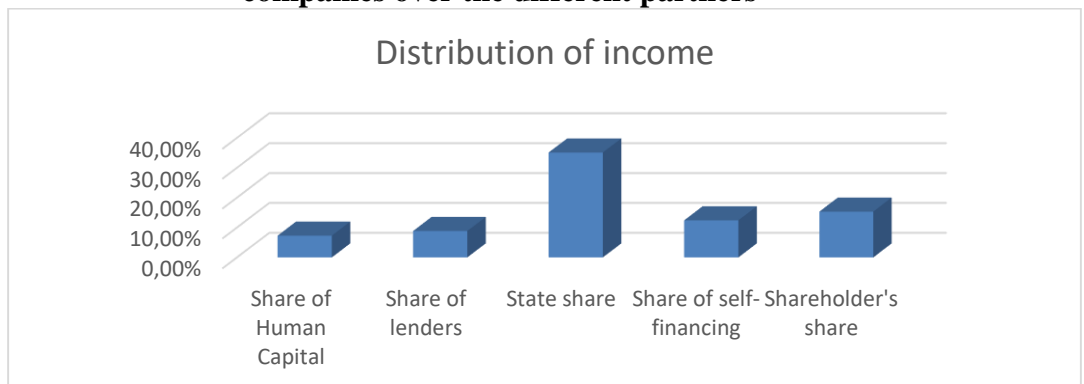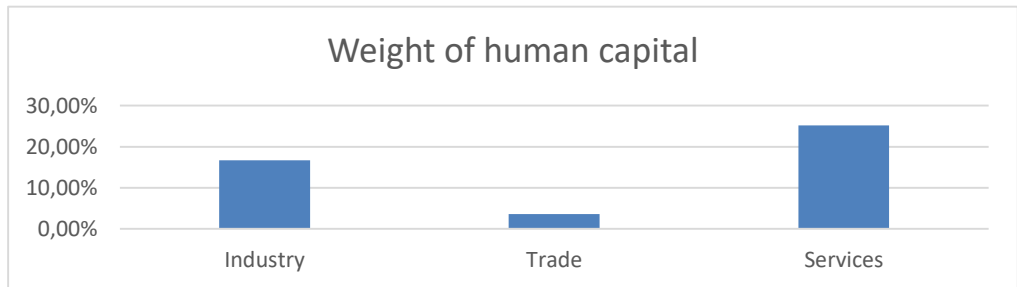

Source: Prepared by the authors based on working sample data

It is quite clear that taxes and duties occupy the largest share of added value, followed by the shareholders' share, then self-financing (depreciation and provisions), then lenders (financial charges) and the share of human capital come in last place.

3.3. Weight of human capital by sector of activity
We are interested here in the description of the weight of human capital in relation to turnover in Algerian companies operating in the fields of services, industry and trade.

**Figure (02): Weight of human capital according to sector of activity**

Source: Prepared by the authors based on working sample data

This figure highlights the service companies in the study sample in first place in terms of investment in human capital, followed by the industrial companies and finally the commercial companies which only devote the equivalent of 3.5% of their annual production to human capital..

3.4. Weight of human capital according to the form of ownership of companies

We try here to describe the efforts of Algerian companies in the field of human resources, whether state, private or multinational.

Figure (03): Weight of human capital according to the form of ownership of the company
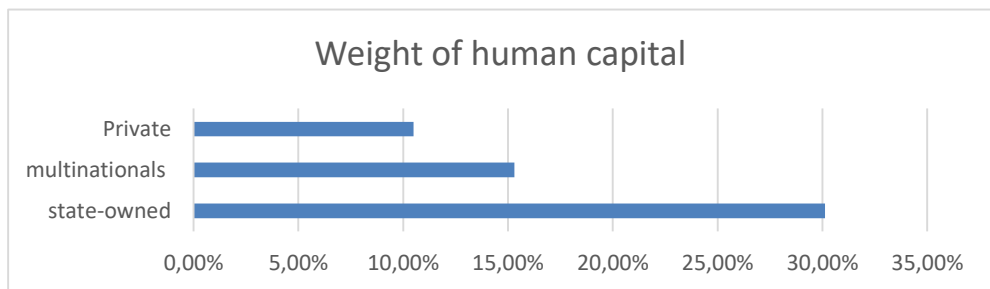
Source: Prepared by the authors based on working sample data

This graph shows that the state-owned companies in the study sample devote the equivalent of one third of their annual output to human capital investment, followed by multinationals with a 15% share. However, the private companies in the study sample only spend the equivalent of one tenth of this output on its employees.

4.Results of the study of the "human capital - performance" relationship

After our attempt to identify a satisfactory definition of the concept of human capital, our second ambition was to think about quantifying this important component of intangible assets in the Algerian context. Finally, we tried to crown these efforts by testing the presence or not of a significant link between human capital and the performance of a sample made up of the 50 largest Algerian companies. This performance, which is our variable to be explained, will be approached on three aspects: commercial, economic and financial. As for the explanatory variable which is human capital (HC), due to the lack of accounting data displayed on the corporate accounts of the companies in our sample, the measurement of this investment will be through account 63 "Staff costs". This accounting heading covers all expenses incurred by the company in the context of the remuneration of its employees. It is in fact a flow of wealth that the company pays to retain its human capital. This variable will be relativized by turnover to have a ratio and not an absolute amount in order to ensure consistency with the variable to be explained and comparability between individuals of different sizes in the sample. Indeed, and for the three performance components, the explanatory variable dedicated to human capital will be measured by the ratio :

HC = Staff costs / Sales Turnover

The task of the econometric calculations is carried out by the Eviews software, which provided us with the following results.

4.1. Impact of human capital on business performance

The ambition to prove the presence or absence of a significant relationship between investment in human capital (HC) and the performance of Algerian companies will be concretised through two variables:

The variable to be explained: *which is the commercial performance (CP) measured by the ratio : CP = Net profit / Sales Turnover*

The explanatory variable: *which is the human capital (HC) measured by the ratio : HC=Personnel costs / Sales Turnover*

The study of the correlation between these two variables is illustrated in the following table:

Figure (04): Screenshot of the results of the study of the impact of human capital on the business performance of Algerian companies

```
Dependent Variable: RC
Method: Panel Least Squares
Date: 11/04/19   Time: 16:29
Sample: 2010 2013
Periods included: 4
Cross-sections included: 50
Total panel (balanced) observations: 200
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.155557	0.024051	6.467870	0.0000
_CH	-0.710298	0.057475	-12.35846	0.0000

R-squared	0.435466	Mean dependent var		0.034494
Adjusted R-squared	0.432615	S.D. dependent var		0.412396
S.E. of regression	0.310637	Akaike info criterion		0.509569
Sum squared resid	19.10613	Schwarz criterion		0.542552
Log likelihood	-48.95689	Hannan-Quinn criter.		0.522917
F-statistic	152.7316	Durbin-Watson stat		2.064590
Prob(F-statistic)	0.000000			

Source: Results posted by E-Views

These results show an adjusted determination rate of 43%, a value low enough to speak of a significant link between investment in human capital and the performance of the Algerian companies in our sample.

4.2. impact of human capital on financial performance

This relationship will be tested through the explanatory variable (CH) previously presented and the variable to be explained which is the financial performance (FP) measured by the ratio:

$$FP = Net\ income\ /\ Equity$$

The following table shows the results of the correlation study between these two variables:

Figure (05): Screenshot of the results of the study of the impact of human capital on the financial performance of Algerian companies

```
Dependent Variable: RF
Method: Panel Least Squares
Date: 11/04/19   Time: 16:34
Sample: 2010 2013
Periods included: 4
Cross-sections included: 50
Total panel (balanced) observations: 200
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.129742	0.030053	4.317110	0.0000
_CH	-0.132207	0.071818	-1.840870	0.0671

R-squared	0.016827	Mean dependent var		0.107208
Adjusted R-squared	0.011862	S.D. dependent var		0.390483
S.E. of regression	0.388160	Akaike info criterion		0.955150
Sum squared resid	29.83227	Schwarz criterion		0.988133
Log likelihood	-93.51503	Hannan-Quinn criter.		0.968498
F-statistic	3.388804	Durbin-Watson stat		2.635405
Prob(F-statistic)	0.067137			

Source: Results posted by E-Views

According to the figures shown in this table, the human capital of Algerian companies is correlated with their financial performance only at 1.18%. A value tending towards zero proves the absence of a relationship

between the human component of intangible wealth and the financial performance of the Algerian companies in our research sample.

4.3. Impact of human capital on economic performance
This impact will be highlighted by studying the correlation between human capital (HC) and economic performance (EP) as measured by the ratio:

EP= Operating profit / Total assets

Here are the results of this study:

Figure (06): Screenshot of the results of the study of the impact of human capital on the financial performance of Algerian companies

```
Dependent Variable: RE
Method: Panel Least Squares
Date: 11/04/19   Time: 16:32
Sample: 2010 2013
Periods included: 4
Cross-sections included: 50
Total panel (balanced) observations: 200
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.098595	0.011241	8.771390	0.0000
_CH	-0.058093	0.026862	-2.162675	0.0318

R-squared	0.023077	Mean dependent var		0.088694
Adjusted R-squared	0.018143	S.D. dependent var		0.146517
S.E. of regression	0.145181	Akaike info criterion		-1.011717
Sum squared resid	4.173368	Schwarz criterion		-0.978734
Log likelihood	103.1717	Hannan-Quinn criter.		-0.998369
F-statistic	4.677161	Durbin-Watson stat		1.465570
Prob(F-statistic)	0.031765			

Source: Results posted by E-Views

Once again, the calculations show a very low value (1.81%) of the coefficient of determination. A result that rejects the existence of a link between economic performance and investment in human capital of Algerian companies.

CONCLUSION:
Our research focused on three main objectives: to draw a clear profile and define in a fairly satisfactory manner the concept of human capital, to propose a reliable tool to quantify the investment of Algerian companies in this field and finally to verify the presence of no link between this human wealth and performance in the Algerian context.

The review of the literature on the subject allowed us to organise our reading according to three approaches. The economic approach endorsed the idea that human capital is the set of productive capacities of the individual that comes from his or her personal, innate gifts, training and continuous development. As for the accounting approach, and despite various works recommending that companies treat certain expenses (recruitment, integration, training, development) as capital expenditures and make them an asset that can be depreciated over several years, they have never been incorporated into accounting standards, either national or international. This

impasse in human resources accounting has led to the current prevailing research trend, namely the managerial approach to human capital. Managers define it as the set of knowledge, skills, competencies, and individual characteristics that facilitate the creation of personal, social, and economic well-being. It is an intangible asset that can advance or sustain productivity, innovation and employability.

The objective of measuring human capital was not very obvious to achieve. Indeed, in the age of the knowledge society, traditional accounting is structurally flawed because knowledge and skills are not represented. Several alternatives have tried to propose measurement methods based on various approaches, namely historical cost, which stipulates that investment in human capital should be calculated by grouping together the various costs relating to recruitment, training, integration, transfer and organisational costs. There is also the replacement cost method, which measures what human resources would cost today. There is also a valuation method based on an economic approach that considers human capital or as a source of income, the value of which is the present value of future income adjusted according to a discount rate specific to the holder of the source.

With regard to the present research work, the quantification of the human component of the intangible wealth of the Algerian company was carried out through a dashboard which gives a value through a number of indicators, not to the human capital of the company, something which has always been rejected, but rather to the investment that the organisation creates for this human capital. The approach taken to the measurement of this was the cost approach based on the idea that the asset is worth what it cost. We decomposed the investment in human capital into the stages of the relationship between the firm and its employee: recruitment, compensation, training and support. Next, we proceeded to scan the entire nomenclature of accounts of the financial accounting system applied in Algeria in order to be able to draw from it those which have a relationship, however slight, with the elements constituting one of the four components of the investment in human capital of the Algerian firm. The aim was to provide managers with a reliable instrument with indicators that are easy to provide and which enables them to identify the dimensions of the intangible wealth of their enterprises.

Our first ambition was to study the link between investments in human capital on the performance of the companies in the sample while measuring the explanatory variable by the accounting quantifiers previously proposed. But the reality was much less generous than we had imagined. It proved impossible to obtain all the necessary detail from the financial statements.

Specifically, the accounting relationships involved in measuring human capital investment, while still very approximate, require the detail of three- or four-digit accounts, which is not available in these accounting statements. Faced with such a shortcoming, the solution considered to overcome this obstacle, even if it is to the detriment of the accuracy of the measurement, was to be satisfied with the heading "Personnel expenses", which includes all expenses incurred by the business in the context of employee compensation.

The descriptive study of the human capital's studied phenomenon showed the absence of a positive evolution of the efforts made by the firms in our sample in this type of capital. It was also found that the share of employees in the firms comes last after the remuneration of the State, material capital, shareholders and lenders. Another conclusion which consists in putting the public firms as well as the service firms of our sample in the first position in terms of investment in the human component.

As for the issue of the relationship between human capital and performance, the majority of empirical studies have highlighted a positive link with varying degrees of significance depending on the activity's sector of the companies or the general economic context of the study. For our part, we have attempted to verify this relationship through a sample consisting of a cylindrical panel over 4 years [2010-2013] and including 50 large Algerian companies. As regards the variable to be explained, which is performance, it was approached on three axes: commercial measured by net profit in relation to turnover, financial measured by return on equity and economic measured by operating profit in relation to total assets.

The link between performance and human capital of the companies in our sample was verified by the determination coefficient, which showed a low value for business performance and a rate tending towards zero for both financial and economic performance, which can hardly confirm with certainty the hypotheses of our study. The absence of a significant relationship between these two phenomena indicates that the large Algerian companies in this sample do not yet consider their employees as a factor of production or a source of wealth creation. The human dimension has not gone beyond the framework of an operating expense. Nevertheless, it is important to point out that, despite its weakness (determination coefficient equal to 43%), the relationship between business performance and human capital is more important than those linking the latter with financial and economic performance, which showed zero determination rates. This can be explained by the fact that the wage bill of many enterprises is made up of a variable part paid according to the efforts of their sales agents who work on a piecework basis and are paid according to the quantities sold.

It must be said that our results are conditioned by three limitations that can be attributed to our research work:

The quality of the data: the data collected from the financial statements of the companies in the sample are values relating to detailed accounts in two digits only. This shortcoming was to the detriment of the accuracy of the results.

The size of the sample: the size of our sample is likely to be questioned because the number 50 hardly represents the category of large Algerian companies that exceed 2000 companies.

The period studied: studies of the relationship between human capital and company performance are generally carried out over periods of 5 to 7 years, whereas our research sample is cylindrical over a period of only 4 years. Such a period is hardly sufficient to reap the benefits of the expenditure incurred on the human wealth of the company. In other words, we would have to wait a little longer to be able to make the most of the knowledge we have learned and capitalise on the experience we have acquired.

Despite these limitations, our research nevertheless opens the way for further research. Indeed, more accurate measures of human capital, by expanding the sample size over a larger number of companies and over a longer period of time would improve our results. In addition, work on the impact of form of ownership and sector of activity on the magnitude of human wealth of Algerian firms can usefully complement this study.

REFERENCES

➢ **Books:**
1. BECKER G. S. (1964). "*Human Capital, A Theoretical and Empirical Analysis*", Columbia University Press for the National Bureau of Economic Research, New York.
2. BECKER. (1993). "*Human Capital: A Theoretical and Empirical Analysis*", with Special Reference to Education The University of Chicago Press.
3. BOUNFOUR A. (1998) « *Le management des ressources immatérielles : maîtriser les nouveaux leviers de l'avantage compétitif* ». Dunod. France.
4. *BOUQUIN H. (2004) « Le contrôle de gestion », Presses Universitaires de France, Collection Gestion, 6ème édition, Paris*.
5. *BOURGUIGNON A. (2000). « Performance et contrôle de gestion », Encyclopédie de Comptabilité, Contrôle de gestion et Audit, Ed. Economica.*

6. CABY L., GREENAN N., GUEISSAZ A. et RALLET A. (1999). «*Quelques propositions pour une modélisation*», In D. FORAY et J. MAIRESSE, « *Innovations et performance »s,* Editions de l'EHESS, Paris.

7. CARRE J.-J., DUBOIS P. & MALINVAUD E. (1983). « *Abrégé de la croissance française »,* Paris, Le Seuil.

8. EDVINSSON L. et MALONE M.S. (1997) *« Intellectual capital: Realizing your company's true value by finding its hidden brainpower»,* Harper Business, New York.

9. FITZ-ENZ J. (2000) *« The ROI of human capital, measuring the economic value of employee performance »,* Amacom.

10. KAPLAN R.S. et NORTON D.P. *(1996). « The Balanced Scorecard: Translating strategy into action »,* Harvard Business School Press, Boston, MA.

11. MARQUES E. (1974). « *La comptabilité des ressources humaines »*, Editions hommes et techniques, France.

12. MARSHALL A**.** (1971)*, « Principes d'économie politique »,* Ed. Gordon and Breach, USA.

➢ **Articles in scientific journal**

13. CIG petite couronne. (2011). « Performance de la gestion des ressources humaine, indicateurs et tableau de bords pour la mesurer » Mars 2011. P6

14. COBB C.W. & DOUGLAS P.H. (1928), « A theory of production », American Economic Review, no18.

15. Denison D. (1984). "Bringing corporate culture to the bottom line", Organization Dynamics, Autumn, pp 4-23.

16. Gérard Ballot, Fathi Fakhfakh et Erol Taymaz. (1998) « Formation continue, recherche et développement et performance des entreprises », Revue Formation Emploi N.64,France, pp. 43-58;

17. HERMANSON R. (1964) . "Accounting for human assets", Bureau of Business and Economic Research, Michigan State University.

18. Huselid M.A. (1995). "The impact of human resource management practives on turnover, productivity and corporate financial performance", Academy of Management Journal, Vol 38, n°3, USA, pp 635-672.

19. LEV B. & SCHWATRZ A. (1971), "On the Use of the Economic Concept of Human Capital in Financial Statements", Accounting Review, Vol. 46 Issue 1, Janvier, USA, pp.103-113.

20. Lise Chrétien, Guy Arcand, Geneviève Tellier & Michel Arcand. (2005) « Impacts des pratiques de gestion des ressources humaines sur la

performance organisationnelle des entreprises de gestion de projets » Revue internationale sur le travail et la société, février, France.

21. OCDE (2001), « *Du bien-être des nations, le rôle du capital humain et social »,* Revue de l'OCDE, France.