Intangible Assets And Company's Market Valuation: The Case Study of Algerian listed companies

Bilal Kimouche [1*]
[1] 20 August 1955 University of Skikda (Algeria)

Received: 18/05/2019 ; **Revised:** 01/09/2019 ; **Accepted:** 01/10/2019

Summary: The purpose of this study is to explore whether intangible assets that reported in financial statements explain the market valuation of Algerian listed companies and whether they affect the explanatory power of accounting information expressed by the company's book value. Our methodology consisted of testing the associations of companies' market values with their book values and intangible assets, based on *Ohlson*'s model and depending on *Pooled regression*. The study has included all Algerian listed companies during the period of 2005 to 2018, using their financial statements available in the COSOB's database, and stock prices published in the SGBV's database. The results indicate that the book values of Algerian listed companies affect the market values of companies and explain their variability, but the explanatory power is weak. However, intangible assets are not value relevant, and they do not have any incremental value relevance, they do not explain the variability of market values of Algerian listed companies and they do not affect the explanatory power of accounting information. Our results suggest a failure of accounting information to explain the market valuation of Algerian listed companies.

Keywords: Intangible assets; Company valuation; Relative value relevance; Incremental value relevance.
Jel Classification Codes : M40, M41

I- Introduction :

In order to satisfy the users' needs of information; managers prepare and present financial statements, which aim to provide useful information about financial position, performance and changes in financial position of a firm[1]. One of the commonly used proxies of the usefulness of accounting information in the literature the *"Value relevance"*, which measures the utility of accounting information from the perspective of investors[2]. "Watts and Zimmerman"[3] described this concept using "*Information perspective*", which views financial statements as providing information on inputs to valuation models. This differs from "*Contracting perspective*" that focus [1] on company's contractual relationships, where accounting used as a basis to determine the contractual clauses and controlling their execution. That's why managers seek to report accounting information as convergent with the contractual clauses.

The objective of value relevance research is to relate annual financial statement figures to a measure of company's market valuation[4]. "Francis and Schipper"[5] defined the value relevance as the ability of financial statements to capture and summarize information reflected by the company's value. Thence, the value relevance measures have been interpreted as the total market share, among all information impounded in company's stock price, attributable to accounting information[6]. This means that accounting items be relevant when they reflect information used by investors to appreciate the company's value. In conclusion, the value relevance interests determining whether accounting information can explain market values of companies, through modeling the association between financial statements figures and market values over a long period. Following "Lam *et al.*"[7], the higher the value relevance, the more the financial statements can be relied upon to make investment decisions and thus, the greater the association between financial statement items and company's market valuation.

* Corresponding author, kimouchebilal@gmail.com

According to "Lev"[8], the studies concerned by the value relevance have reported a remarkably low statistical association between accounting information and companies' market valuation, where the explanatory power as measured by R^2 was often below 10%. During the two last decades, several studies have indicated that the association between companies' market values and accounting has declined and financial statements have lost their value relevance over time[9]. However, other studies found a change of value relevance of financial statements in different directions when different items are used[10]. Another studies showed remarkable differences between the value relevance of financial statements items over time, either for different industries or different countries[11].

Since the middle of 90's, several researchers have interested by the gap between market values of companies and their book values as a sign of the declining value relevance of accounting information over time. This gap represents not only a revolutionary change in the process of economic value creation, but also a declining value relevance of traditional financial measures[12]. "Francis and Schipper"[13] suggested that such phenomenon might result either because accounting practices have remained stagnant while business has changed, or because accounting practices have changed in ways that diverge from providing value relevance information. According to "Lev and Zarowin" [14], the declining value relevance of accounting information is mainly caused by the increasing pace of change affecting business, and the inadequacy of accounting system to reflect this change, what confirms the findings of "Aboody and Lev"[15].

Intangibles represent changes driver or changes produce, since economy has shifted from one based on tangible assets and manufacturing to one increasingly based on intangible assets, services and information, accounting has not kept up with these changes[16].To be useful, and hence value relevant, financial information must not represent only relevant phenomena, it must also faithfully represent the phenomena that it purports to represent[17]. The definition of value relevance is in fact the operationalizing of all qualitative characteristics, especially relevance and reliability[18]. Nevertheless, the traditional accounting model oriented toward the past and based on transactions theory to recognize economic events, has become incapable to reflect the progressive transformations in economic activities, where intangibles oriented toward the future play an important role. For that, the value relevance of accounting information has negatively affected, because financial statements provide reliable but not relevant items to assess company's value.

The value relevance claims that any event likely to affect a company's current financial position or its future performance should be reported in its annual accounts, but that is not the case for intangibles, which are partially reported in financial statements. Accounting criteria for recognition and measurement do not allow reporting the most part of intangibles. Consequently, financial statements have lost more of their informativeness, what affects positively the gap between market values and equity's book values, without taking into consideration the other affecting factors[19].

Today's economy is driven primarily by creation and manipulation of intangible assets[20] that are a key factor for development and success of organizations competing in the economic and technological context[21]. From a managerial approach, intangibles represent strategic assets that give and sustain competitive advantages for the companies. While from an economic approach, intangibles have become the main instigator of value creation and company's growth in the future[22]. As consequence, IASB has worked hardly to develop guidelines for identification and recognition of intangible assets, adequate criteria for their measurement and some directions for their disclosure, in order to improve financial statements content.

Algeria has been considered among the developing countries characterized by a tangible-based economy. Consequently, Algerian companies are less competitive internationally. Nevertheless, the available data about intangibles in Algerian companies, and their contribution in value creation are insufficient. In addition, Algerian accounting practices have known a revolutionary change since 01/01/2010, after the adoption of "*Financial Accounting System*", which based on IFRS. As a result, the accounting of intangibles in Algeria after 2010 has become similar with IFRS recommendations.

This paper aims to investigate the value relevance of intangible assets that recognized in financial statements of Algerian listed companies, through exploring the association of companies' market valuation with their intangible assets' accounting measures. The remainder of this first section presents the theoretical framework and literature review, while the section 2 highlights the

methods and materials. Section 3 presents results and discussion, and the last section summarizes the conclusions.

I.1. Theoretical framework

Value relevance studies are a sub-field of the market-based studies that interest whether accounting information affects the company's valuation. This trend of studies has tried since the 60's to highlight the role of accounting information on decision-making in the financial market, and its ability to explain the company's market value. The work of "Miller and Modigliani"[23] in 1966 was the first in this field, which documented the role of profits capitalization in the valuation of company. However, "Ball, Brown and Beaver" deserve to be considered the founders of the research about the informational content of accounting information in general. In 1968, "Ball and Brown"[24] demonstrated the correlation between earnings and market share prices, which confirmed by "Beaver"[25] in the same year, observing the high response of stock prices and transactions volume to the disclosure of financial statements. The study of "Amir *et al.*"[26] in 1993 is the first that uses the term "Value Relevance" to describe the relationship between accounting information and the company's value in the financial market.

I.1.1. Accounting information and market valuation of company

Studies about the value relevance of accounting information are classified within the accounting positive research. According to "Cormier and Magnan" and "Tremblay", this approach is based on three main contributions[27]. The first is the positive approach of "Friedman", which based on exploring the reality to examine the validity of assumptions. Make a judgment about the usefulness of accounting information requires examining its relationship with market prices (in a long term) or the responsiveness of market prices to the disclosure of financial statements (in a short term). The second is the Capital Market Efficiency Hypothesis in which securities market prices at a particular time reflect all available information about the company, so any new disclosed unknown information will be immediately reflected in securities market prices. The third is the Capital Asset Pricing Model, which relates returns with the risks from financial investment, stating that achieving a high level of returns requires the same level of risks; the role of accounting information is to help investors to predict the future returns and the relating risks.

According to "Beaver"[28], establishing a conceptual relation between current company's value (stock price) and contemporaneous accounting information, needs to develop three separate but interrelated links: the link between current stock prices and future expected cash flows, the link between future expected cash flows and future earnings, and the link between future earnings and earnings as realized (and reported) today. In this framework, as depicted in Figure 1, cash flows are the focus of interest for investors, who are interested with the cash that can be earned rather than the profit that the company can be generated. This correlation is difficult to establish (first link), as it requires estimating future earnings and expected distribution ratios (second correlation) based on current earnings (third link). According to this analysis, current accounting information is an indicator of future earnings, which is an indicator of expected cash flows that determine company's current market value, and therefore the role of accounting information is to increase the ability of investors to predict the company's future performance, so the primary role of accounting is to improve the third link.

The above analysis is focused on the need of investors for useful financial information, to determine whether a company can generate future cash flows, and predict their amount, their timing and their uncertainty, in a way to assess the company's market value and making rational investment decisions. According to "Dimontier and Raffournier"[29], accounting information is useful only if it allows forecasting of future performance based on historical observations. And therefore the value relevance of accounting information means that investors will use it to determine the value of securities.

"Francis and Schipper"[30] documented four interpretations for the value relevance in the literature. Interpretation 1 (The fundamental analysis view) is that financial statement information leads stock prices by capturing intrinsic share values toward which stock prices drift. Value relevance would then be measured as the profits generated from implementing accounting-based trading rules. Under Interpretation 2 (The predictive view), financial information is value relevant if it contains the variables used in a valuation model or assists in predicting those variables. Thus, the value relevance of earnings for a discounted dividend valuation model, or a discounted cash

flow valuation model, or a discounted residual income model, might be measured by the ability of earnings to predict future dividends, future cash flows, future earnings, or future book values.

Interpretations 3 and 4 are based on value relevance as indicated by a statistical association between financial information and prices or returns. Under Interpretation 3 (The informational view), the statistical association measures whether investors actually use the information in question in setting prices, so value relevance would be measured by the ability of financial statement information to change the total mix of information in the marketplace. This interpretation implies that value relevance is measured in terms of "news," implying that value relevant information changes stock prices because it causes investors to revise their expectations. According to Interpretation 4 (Measurement view), a statistical association between accounting information and market values or returns, particularly over a long window, might mean only that the accounting information in question is correlated with information used by investors. Under this view, value relevance is measured by the ability of financial statement information to capture or summarize information, regardless of source, that affects share values. This interpretation does not require that financial statements be the earliest source of information.

I.1.2. Intangible assets and market valuation of company

In the context of agency theory, the objective of managers is to maximize the value for shareholders, which requires providing information needed to increase the present value of expected cash flows, in which the share value and the cost of capital are determined. Therefore, accounting information about intangibles can contribute to determining the company's fair value, explaining the gap between accounting values of companies and their market values, and providing information about the performance factors that can generate value for investors.

According to "Yu"[31], information about intangibles allows reducing the monitoring costs for investors and lenders, bonding costs for managers, and the political costs for the company, which lead to minimize the cost of capital. This can be achieved by using accounting choices of intangibles to manage accounting information, and affect positively financial ratios, as documented by "Vernimmen"[32]. However, "Aboody and Lev"[33] documented that underperforming companies capitalized intangibles to enhance their reported earnings and provides control variables. It can be achieved also by extending voluntary disclosure about intangibles to reduce information asymmetry and improving the ability of investors to predict future perspectives of the company. "Resources-Based View" described intangibles as strategic resources and source of competitive advantages and extraordinary earnings, and hence a canal of external communication with stakeholders to enable them to assess the value of their company.

In the context of signaling theory, "Deng *et al.*"[34] emphasized the role of intangibles in the future performance of companies. They found that intangible investments increase future earnings, which determine the market value of the company, so a correlation can be expected between market prices and intangible investments, as well as a positive correlation between market returns and growth in intangible investments. Therefore, when selecting and applying accounting policies, managers can use accounting choices of intangibles to send desired signals towards the financial market. According to "Dumontier"[35], accounting choices adopted by managers conveyed signals about the company to investors, so the capitalization of intangibles, their depreciation or impairment is assumed to reflect managers' expectations and increase the value relevance of accounting information.

Although accounting policies for intangibles do not affect directly cash flows, several studies have indicated an important response by market prices to accounting information about intangibles, due to their indirect impact on cash flows as suggested by the agency theory. In other hand, intangibles have considered the mainly determinant of the company's future performance, and hence accounting information about them is a signal to investors reflecting the perspectives of the company, which affect investors' decisions, and thus the company's market valuation. The studies tended to confirm the above conclusion, by providing evidence that intangibles are a subject for external communication with investors in the financial market, as they boost or amend investors' expectations about future cash flows and risks related to them.

I.2. Literature review

The value relevance of intangibles studies have known an important interest by researchers since the early of 90's, as a response to the rising interest given to intellectual capital and

knowledge economy in the managerial and economic literature. In USA, "Sougiannis"[36] suggested that investors place a high value for intangible investments, he distinguished between the indirect effect, when R&D affect market values through earnings, and direct effect that reflects new information conveyed by R&D, he assessed also that on average the indirect effect is more than the direct effect. "Aboody and Lev"[37] found that capitalized software amounts summarize relevant information; they associated with market variables and future earnings.

"Seethamraju"[38] observed significant abnormal returns related with brands capitalized as a part of business combination, the returns related with companies that reported quantitative information are more than with those that reported only qualitative information. This reflects the role of quantitative information in reduce the uncertainty related to the impact of brands acquisition on company's future performance. "Goodwin and Ahmed"[39] confirmed the indirect effect of intangible items on market values; they demonstrated that companies capitalizing intangibles have increasing value relevance of earnings. "Zhao"[40] showed that the reporting of total R&D costs increases the association of equity market prices with earnings and book values, in countries with complete R&D expensing. While the allocation of R&D costs between capitalization and expense, provides incremental information content over that of total R&D costs, in countries permitting conditional capitalization of R&D costs.

In UK, the results of previous studies were convergent with the USA context, they reflect the Anglo-American accounting model oriented toward the financial markets, and the corporate governance model based on investors. "Kallapur and Kwan"[41] examined the value relevance and reliability of brand assets recognized by 33 UK listed companies during 1985 to 1997. The results showed that brand assets are value relevant, they associated positively and significantly with stock prices and explained 96% of their variability. "AbuGhazaleh *et al.*"[42] assessed the value relevance of goodwill impairment losses following the adoption of IFRS 3. Using a sample of 528 observations over 2005 and 2006, the results revealed a significant negative association between goodwill impairment losses and market values, suggesting that these impairments perceived by investors as a decline in the performance of company.

"Istrate"[43] analyzed the value relevance of goodwill and other intangible assets in the pre- and post-adoption periods of IFRS, using a sample of 350 UK companies over 2002 to 2007. The results showed that goodwill and other intangible assets are value relevant, but their value relevance did not increase in the post-adoption period. Based on a sample of UK and Russian companies, "Garanina and Pavlova"[44] found a positive correlation between market value of equity and intangible assets.

"Tsoligkas and Tsalavoutas"[45] have interested by the value relevance of R&D, after the IFRS mandatory adoption. Based on a sample of 418 observations during 2005 to 2007, the results showed that the capitalized R&D is positively related to market values, suggesting that market perceives these items as successful projects with future economic benefits. While R&D expenses are negatively related to market values, supporting the proposition that they reflect no future benefits and thus they should be expensed. Using UK sample, "Oswald and Zarowin"[46] found that R&D capitalization leads to a higher association between current stock returns and future earnings. This implies that investors are better informed by R&D capitalization.

In France, the results of earlier studies were contradictory; they reflect the particularities of financial disclosure in French capital market, and the differences between French corporate governance model and the Anglo-American one. "Ding and Stolowy"[47] tested whether R&D capitalization decision improves the value relevance of accounting numbers. Their analyses do not provide any positive results. "Loulou and Triki"[48] suggested that activated R&D constitutes preferred treatment for managers, not only to signal investors about future perspectives, but also to respond opportunely for the contractual stakes, in order to minimize political costs or smoothing earnings. 'Thibierge"[49] interested by intangible assets as a stake of financial reporting. Starting from a sample of 176 French companies and 85 Spanish companies, he indicated that intangible assets did not affect stock prices, but they permit liberating to liquidity or debt covenants, and he showed important differences between both countries.

Using a sample of 470 French companies, during the period of 1994 to 1999, "Cazavan-Jeny"[50] found a significant statistical association of market-to-book ratio with capitalized goodwill, while no a significant statistical link has been found, neither with expensed intangibles, nor with other capitalized intangibles. He suggested that the multitude accounting treatments concerning intangibles may explain why these items are not taken into account by French capital markets when

estimating the values of companies. "Jamoussi *et al.*"[51] examined the value relevance of intangibles and the value relevance of traditional accounting information, which expressed by earning. Based on a sample of 391 French listed companies from 2001 to 2004, the results have confirmed the importance of earnings and intangibles for company valuation. However, they showed a significant decreasing value relevance of traditional accounting information for the high technology companies' valuation unlike intangibles, which have affected positively and significantly the market values of those companies.

"Lenormand and Touchais"[52] asked question about the role of IFRS in improving the informational content of intangible assets. The results showed a significant disparity between goodwill and identifiable intangible assets under different standards, and intangible assets are partially more value relevant only under IFRS. "Boulerne and Sahut"[53] tested the information content of intangible assets under IFRS, when compared with the local GAAP for French listed companies. They found that the transition to IFRS did not affect the overall amounts of intangible assets, even though it operated substitution effects in favor of goodwill. They found also that the total amounts of intangible assets and goodwill to gather are value relevant under IFRS, suggesting that financial markets can better integrate such contributions into share prices and returns, especially for companies with high intensity of intangibles.

In Europe, the results were dissimilar between different countries. Focused on a sample of companies that listed in some European financial markets (UK, France and Spain) during 1993 to 2003, "Casta and Ramond"[54] did not find any association between intangibles and market returns, suggesting that investors have a short-term view or "myopic" in constructing of their portfolio, what penalizes companies that reported high intangible investments in their financial statements, which have a long-term view.

Using a sample of 1855 listed companies for ten European countries "Sahut *et al.*"[55] tested the value relevance of intangible assets under IFRS when compared with local European GAAP. The study was carried out over six-year period, from 2002 to 2004 for local GAAP period, and from 2005 to 2007 for IFRS period. The results indicated that book values of intangible assets are higher and have more informative value to explain share prices and stock returns under IFRS than local GAAP. However, goodwill has less value relevance under IFRS than local GAAP. Also, it arises that the identifiable intangible assets provided more value relevance information than intangible assets that transferred into goodwill.

"Morricone *et al.*"[56] investigated the effect of IFRS mandatory adoption on the value relevance of intangibles in Italy. Based on a sample of 267 Italian listed companies during 1996 to 2006, he found an increasing value relevance of intangibles after the IFRS adoption especially for goodwill, he found also that R&D are not value relevant. "Ji and Lu"[57] examined whether the value reliability of intangibles can have an influence on its value relevance in the post-IFRS period when compared with the pre-IFRS period (2000-2009).The study concluded that the value relevance of intangibles has declined since the adoption of IFRS, while intangibles are still more value relevant in companies where reported intangibles are assumed to be more reliable in the post-adoption of IFRS. "Oliveira *et al.*"[58] assessed the value relevance of identifiable intangible assets and goodwill reported in financial statements of all non-financial companies that listed on Portuguese Stock Exchange from 1998 to 2008. They found that the value relevance of goodwill, R&D and other intangible assets has increased after the adoption of IFRS.

I.3. Hypothesis development

This paper aims to contribute in the existing literature and ameliorate the debate about intangibles. Using a recent available financial data and focuses on a developing economy, the study has been considered among the first in Algeria.

First, we interested by the relative value relevance of intangible assets, which measures the power of intangibles to explain market values of companies. Therefore, we test the following hypothesis:

H1: Intangible assets that reported in financial statements of Algerian listed companies are value relevant.

Second, we interested by the incremental value relevance of intangible assets, which measures the increasing value relevance of accounting information caused by intangible assets. For that, we test the following hypothesis:

H2: Intangible assets that reported in financial statements of Algerian listed companies provide incremental value relevance for accounting information.

II– Methods and Materials :

II.1. Model specification

In order to achieve our objectives, we started from *Ohlson*'s model[59], which expressed the market value of company (P_t) as a linear function of its book value (γ_t) and the abnormal earnings ($\chi^a t$) with other dynamic variables information (v_t).

$$P_t = \gamma_t + \Phi_1 \chi^a_t + \Phi_2 v_t$$

Where: Φ_1 and Φ_2 are parameters.

According to *Ohlson*'s model the market value of company is the outcome of investors' decisions that based on information about equity and earnings and other items of financial statements. In other way, the market value of company reflects information about financial position and performance and information about other items that can affect financial position or performance in the future. This means that items of financial statements be value relevant if they reflected by company's market value.

Starting from *Ohlson*'s model, we used three models in order to relate the company's market value with company's book value and intangible assets. Initially, we focused on model (1) to test the relative value relevance of accounting information before intangible assets.

$$P_{it} = \beta_0 + \beta_1 BV\text{-}IA_{it} + \varepsilon_{it} \qquad \textbf{(01)}$$

Where P_{it} is the market value of company, measured by its stock price four months after fiscal year-end; $BV\text{-}IA_{it}$ is the book value of equity per share at year-end minus intangible assets per share, it represents the book value of equity if any intangible assets has not recognized in the balance sheet. β_0 is a constant represents the market value of company when book value of equity take the value zero. β_1 is a constant used to test the association between market values and book values of equity. ε_{it} is the part of market values that are not interpreted by the book value of equity (residuals). To measure the value relevance of book value of equity, we used the coefficient of determination $(R^2_{BV\text{-}IA})$ of model (1), which expresses the volatility of market values that can be explained by book values of equity.

Second, we tested the relative value relevance of intangible assets using model (2).

$$P_{it} = \alpha_0 + \alpha_1 IA_{it} + \mu_{it} \qquad \textbf{(02)}$$

Where IA_{it} is the net amount of intangible assets per share at year-end; α_0 is an estimate of market value when intangible assets in balance sheets take the value zero. α_1 is a constant used to test the association between market values and intangible assets. μ_{it} is the part of market values that is not explained by intangible assets. The value relevance of intangible assets has been measured by the coefficient of determination (R^2_{IA}) of model (2), which measures the volatility of market values that can be assigned to intangible assets.

Third, we measured the common value relevance of accounting information and intangible assets, using a mixed regression model, through adding intangible assets to book values, and jointing intangible assets as an independent variable with accounting information as shown in model (03).

$$P_{it} = \delta_0 + \delta_1 BV_{it} + \delta_2 IA_{it} + 3_{it} \qquad \textbf{(03)}$$

Where BV_{it} is the book value of equity per share at year-end including intangible assets, thence BV_{it} represents the accounting information after intangible assets. δ_0 is an estimate of market value when book value of equity and intangible assets take the value zero. δ_1 and δ_2 are constants used to test the associations between market values and accounting variables. The common value relevance of both accounting information and intangible assets has been measured by the coefficient of determination $(R^2_{BV,IA})$ of model (3).

Finally, as shown in equation (4), we measured the incremental value relevance of intangible assets, which measures the increasing value relevance of accounting information caused by intangible assets.

$$R^2_{IA/BV} = R^2_{BV,IA} - R^2_{BV-IA} \quad (04)$$

Where $R^2_{IA/BV}$ is the incremental value relevance of intangible assets; $R^2_{BV,IA}$ is the common value relevance of accounting information and intangible assets; R^2_{BV-IA} is the relative value relevance of accounting information before intangible assets.

II.2. Sample and data collection

The study has been carried out using a sample included all Algerian listed companies, during the 14th years period from 2005 to 2018. It covered two periods, from 2005 to 2009 for the "*National Accounting Plan*", and from 2010 to 2018 for the "*Financial Accounting System*", which based on IFRS. The data that concern stock prices has been obtained from Algiers Stock Exchange data base *(http://www.sgbv.dz/)*. However, the data that concern independent variables has been collected from financial statements of companies available at their electronic sites, and has been completed from the financial data offered by COSOB *(http://www.cosob.org)*.

III- Results and discussion :

III.1. Descriptive statistic

Table 1 summarizes the descriptive statistic of panel data for each variable, which concern all listed companies over 14 years (2005 to 2018). When we observe the Means, we find a very mirror difference between book value before *(BV-IA)* and after intangible assets *(BV)*, which indicates that the recognition of intangible assets *(IA)* in the financial statements of Algerian listed companies is still limited, as shown in the Table 1 the mean of intangible assets reached 4,423 DA per share, and do not exceed 23,230 DA per share according to the Max value. In other hand, the Table 1 indicates that the mean of market values *(P)* is less than the mean of book values, whether before or after intangible assets, what reflect the inefficiency and the low activity of Algiers Stock Exchange.

III.2. Data validity test

Table 2 summarizes the tests carried out in order to examine the data validity for statistical analyses. Regarding the Normality, our analyses focused on *Shapiro-Wilk Test* and *Kolmogorov-Smirnov Test*. The signification levels of *Shapiro-Wilk* for model (01) and model (03) are less than 5%, what indicates that the residuals of each model are not normally distributed, while the *Shapiro-Wilk* indicates that the residuals of model (02) are normally distributed, the signification level is more than 5%. However, the signification levels of *Kolmogorov-Smirnov* are more than 5% for each model, what indicates that the residuals of each model are normally distributed.

The Independence of residuals has been tested using *Durbin-Watson*, through calculating *Durbin-Watson* statistic and determining *Durbin-Watson* values from table at 5% level. Comparing between *Durbin-Watson* statistic and *Durbin-Watson* values suggests that *Durbin-Watson* statistics are placed between the Max value and the value 2 for each model, what signifies that the residuals of each model are independent.

In order to test the Homoscedasticity, we use *Breusch-Pagan* and *Koenker test*. Table 2 shows that the two tests are not significant for each model; their significance levels are more than 5% for all models. This means that the residuals variances are constant (homoscedastic) for the three models. Finally, concerning the Collinearity, we tested it only for the model (03) that contains two independent variables. Using *Variance Inflation Factor*, which attains 1,017 and does not exceed the value 3, we do not find any sign of collinearity.

III.3. Estimation of Models

Table 3 summarizes model (01), (02) and (03) estimated using Panel data related to Algerian listed companies for the period of 2005 to 2018, depending on *Pooled Regression*. Regarding model (01), *F* statistic suggest that it is significant at 1% level (F = 11,091), therefore the coefficient estimate of book value of equity (β_1) is significant and differs substantially from the value zero, and also the coefficient of determination (R^2_{BV-IA}) differs substantially from the value zero. The outcome of *F* statistic is confirmed by *T* statistic, which indicates that β_1 is significant at 1% level (T = 3,330), and subsequently market values of Algerian listed companies are associated positively (β_1 = 0,252) with their book values. Also it is confirmed by the coefficient of

determination $(R^2_{BV\text{-}IA})$, which indicates that book values of Algerian listed companies explain 20,60% of their market values variability. These results suggest that book values of Algerian listed companies are partially reflected by their market values, and subsequently are value relevant. However, they have a low explanatory power.

Concerning model (02), *F* statistic indicates the non signification of model (F = 0,796), therefore the coefficient estimate of intangible assets (α_1 = 0,052) is not significant (T = 0,892) and it is close to the value zero, and thus the coefficient of determination (R^2_{IA}) does not differ substantially from the value zero. As shown in Table 2, *T* statistic and R^2_{IA} confirm the outcome of *F* statistic. The coefficient estimate of intangible assets (α_1) is not statistically significant, what signifies that market values of Algerian listed companies are not associated with recognized intangible assets. The coefficient of determination (R^2_{IA}) is very close to zero, and attains 2,1%, this means that intangible assets are not reflected in market values of Algerian listed companies. As result, intangible assets that recognized in financial statements of Algerian listed companies are not value relevant, what opposites with H1.

The last model that relates book values and intangible assets with market values of companies is significant at 1% level according to *F* statistic (F = 5,686). However, the coefficient estimate of intangible assets (δ_2) is not significant (T = 0,574), unlike the coefficient estimate of book values (δ_1), which is positive and significant at 1% level (T = 3,222). These results do not differ from the results of model (1) and model (2) that show a positive effect of book values of Algerian listed companies and no effect of intangible assets on their market values.

Comparing model (3) with model (1) show a negative effect of intangible assets on the value relevance of book values of Algerian listed companies. The addition of intangible assets to the book values and their insertion in model (3) has negatively impacted the explanatory power of book values, which moved from 20,6% ($R^2_{BV\text{-}IA}$) in model (1) to 19,4% ($R^2_{BV,IA}$) in model (3). As result, Intangible Assets that recognized in financial statements of Algerian listed companies provide negative incremental value relevance ($R^2_{IA/BV}$ = -1,2%) for book values, what opposites with H2. However, the difference between $R^2_{BV\text{-}IA}$ and $R^2_{BV,IA}$ is not substantial.

III.4. Discussion

The results indicate that except intangible assets, which do not have value relevance to the valuation of the Algerian listed companies, the book values have been found value relevant to the valuation of the Algerian listed companies, whether before or after intangible assets. However, their explanatory power was low, and has known a decrease after intangible assets.

These results tend to diverge from the results of previous studies, especially those that carried out in developed economies. Concerning intangible assets, our results differ from the findings of several prior researches suggesting that intangible assets associated positively and significantly with market values of companies, and explain their variability (Aboody and Lev; Kallapur and Kwan; Jamoussi *et al.*; Oliveira *et al.*; Tsoligkas and Tsalavoutas; Istrate).

Our results related to book values confirm partially the findings of most prior studies that suggest the value relevance of book values to companies' market valuation. However, their explanatory power has found weak, unlike prior studies that suggest a high explanatory power of book values. The study indicates also that intangible assets do not have any incremental value relevance, and do not affect the association of market values of companies with their book values, unlike several prior researches, which confirm the indirect effect of intangibles on market values of companies through their book values or earnings (Sougiannis; Zhao; Goodwin and Ahmed; Oswald and Zarowin; Loulou and Triki).

The divergences of this study from the prior researches can be assigned to the particularities of Algerian economy, which represents a developing and tangible-based economy, besides the other characteristics of Algerian environment:

- Algerian accounting model oriented toward the economy regulation like taxation.
- Algerian corporate governance model based on owners and government without taking into consideration the investors and financial markets.
- Financial reporting culture of Algerian managers that characterized by the caution, where accounting information has considered as secret.
- The inefficiency and the non-activity of Algiers Stock Exchange, which includes a modest number of listed companies, and characterized by a low volume of transactions.

IV- Conclusion :

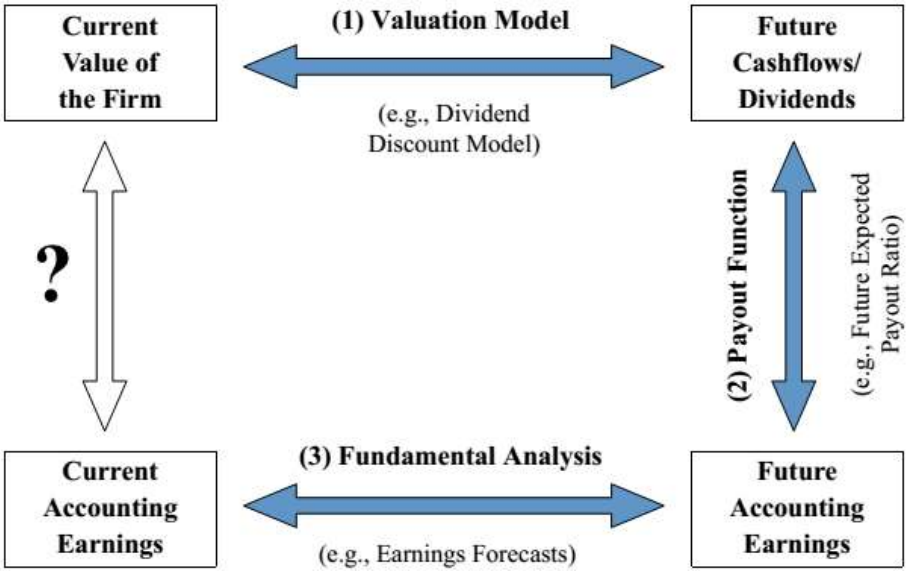
This paper analyzed the relative value relevance and the incremental value relevance of intangible assets that reported in financial statements of Algerian listed companies. Our methodology has focused on displaying the role of intangible assets in explaining the market values of companies, and verifying the impact of intangible assets on the power of accounting information (book value of equity) to explain market values variability. For that, the associations of market values of companies with intangible assets and book values of equity have been examined; also the effect of intangible assets on the association between market values of companies and book values of equity has been verified.

The study interested by the Algerian listed companies, including all listed companies during the period of 2005 to 2018. Our research design has based on *Ohlson*'s model and *Linear regression*, in order to develop three models, which have been estimated using *Ordinary Least-Squares (OLS)*, after ensuring that the *OLS*'s criteria have been fulfilled. Hereafter making sure the signification of models using *F-statistic*, we verified the associations of market values of Algerian listed companies with independent variables using *Student test*, and we measured the value relevance of accounting variables by the *Coefficients of determination* (R^2).

The results indicate that the market values of Algerian listed companies are associated with their book values that explain their variability; therefore book values are value relevant, while they have low value relevance. In other hand, intangible assets are not value relevant; they do not associate with market values of companies and they do not explain their variability. The results suggest that intangible assets do not have any incremental value relevance; this means that intangible assets do not affect the association of book values of companies with their market values, and do not improve their explanatory power. Comparing with the literature, this study follows the methodical procedures of several prior researches. However, we can address some differences between our study and the prior researches. First, we have converted the accounting variables amounts obtained from the financial statements into their natural logarithmic counterparts. Second, we have improved the measure of incremental value relevance of intangible assets via measuring the relative value relevance of book values after eliminating the effect of intangible assets. For that, we subtracted intangible assets from book values.

- Appendices :

Figure (1) : Conceptual link between market measures and accounting measures



The source : Hail, L. (2013), **Financial Reporting and Firm Valuation: Relevance Lost or Relevance Regained?**, Accounting and Business Research, 43(4), p. 332.

Table (1) : Descriptive statistic of data

		P	*BV*	*IA*	*BV-IA*
N	Valid	41	41	41	41
	Missed	0	0	0	0
Mean		542,439	783,294	4,423	778,871
Median		450,000	590,674	2,855	590,313
Standard deviation		248,597	604,609	5,257	602,822
Min		265,000	161,270	0,000	157,280
Max		1470,000	2793,150	23,230	2780,250

The source : Author depending on SPSS.

Table (2) : Data validity test for statistical analyses

NORMALITY TEST						
	Kolmogorov-Smirnov			***Shapiro-Wilk***		
	Statistic	***df***	***Sig.***	***Statistic***	***df***	***Sig.***
Model (01)	0,138	22	0,200	0,897	22	0,026
Model (02)	0,139	22	0,200	0,907	22	0,055
Model (03)	0,137	22	0,200	0,904	22	0,049
INDEPENDENCE OF RESIDUALS						
		DW from table at 5%				
	Durbin-Watson statistic	***Min***	***Max***	***Observation***		
Model (01)	1,998	1,442	1,544	Max < 1,998 < 2		
Model (02)	1,804	1,442	1,544	Max < 1,804 < 2		
Model (03)	1,986	1,391	1,600	Max < 1,986 < 2		
HOMOSCEDASTICITY TEST						
	Breusch-Pagan		***Koenker test***			
	LM	***Sig***	***LM***	***Sig***		
Model (01)	0,604	0,437	0,409	0,522		
Model (02)	0,247	0,619	0,210	0,647		
Model (03)	0,684	0,710	0,447	0,800		
COLLINEARITY TEST						
	Variables		***Variance Inflation Factor***			
Model (03)	***BV, IA***		1,017			

The source : Author depending on SPSS.

Table (3) : Models results

Model (1)		***Unstandardized Coef.***	***Standardized Coef.***						
		B	***Std. Error***	***Beta***	***T***	***Sig.***	***F***	***Sig.***	$R^2_{BV\text{-}IA}$
	Constant	4,563	0,491		9,287	0,000	11,091	0,002	0,206
	BV-IA	0,252	0,076	0,475	3,330	0,002			
Model (2)		***Unstandardized Coef.***	***Standardized Coef.***						
		B	***Std. Error***	***Beta***	***T***	***Sig.***	***F***	***Sig.***	R^2_{IA}
	Constant	6,117	0,099		61,491	0,000	0,796	0,378	0,021
	IA	0,052	0,006	0,143	0,892	0,378			
Model (3)		***Unstandardized Coef.***	***Standardized Coef.***						
		B	***Std. Error***	***Beta***	***T***	***Sig.***	***F***	***Sig.***	$R^2_{BV,IA}$
	Constant	4,537	0,498		9,102	0,000			
	BV	0,249	0,077	0,467	3,222	0,003	5,686	0,007	0,194
	IA	0,030	0,052	0,083	0,574	0,570			
	INCREMENTAL VALUE RELEVANCE INTANGIBLE ASSETS $R^2_{IA/BV} = R^2_{BV, IA} - R^2_{BV\text{-}IA}$ = 19,4% - 20,6% = -1,2%								

The source : Author depending on SPSS.

Referrals and references :

[1] IASB (2018), **Conceptual Framework for Financial Reporting**, UK: IFRS Foundation, p. 17.
[2] Beisland, L. A. (2009), **A Review of the Value Relevance Literature**, The Open Business Journal, 2, p. 9.
[3] Watts, R. L. and Zimmerman, J. L. (1990), **Positive Accounting Theory: A Ten Year Perspective**, The Accounting Review, 65(1), p. 132.
[4] Dahmash, N. and Qabajeh, M. (2012), **Value Relevance of Ohlson Model with Jordanian Data**, Interdisciplinary Journal of Contemporary Research in Business, 3(11), p. 550.
[5] Francis, J. and Schipper, K. (1999), **Have Financial Statements Lost their Relevance?** Journal of Accounting Research, 37(2), p. 326.
[6] Balachandran, S. and Mohanram, P. (2011), **Is the decline in the value relevance of accounting driven by increased conservatism?** Review of Accounting Studies, 16(2), p. 275.
[7] Lam, K.C.K., Sami, H. and Zhou, H. (2013), **Changes in the value relevance of accounting information over time: Evidence from the emerging market of China**, p. 1, visited 01/03/2014, http://dx.doi.org/10.1016/j.jcae.2013.06.001.
[8] Lev, B. (1989), **On the usefulness of earnings and earnings research: Lessons and directions from two decades of empirical research**, Journal Accounting Research, 27, p. 163.
[9] Check: Dontoh, A., Radhakrishnan, S. and Ronen, J. (2007), **Is stock price a good measure for assessing value-relevance of earnings?** Review of Managerial Science, 1(1), pp. 03-45.
[10] Check:
- Gjerde, Ø., Knivsflå, K. and Sættem, F. (2011), **The value relevance of financial reporting in Norway 1965-2004**, Scandinavian Journal of Management, 27, pp.113-128.
- Chalmers, K., Clinch, G. and Godfrey, J. M. (2011), **Changes in value relevance of accounting information upon IFRS adoption: Evidence from Australia**, Australian Journal of Management, 36(2), pp. 151-173.
- Hail, L. (2103), **Financial Reporting and Firm Valuation: Relevance Lost or Relevance Regained?** Accounting and Business Research, 43(4), pp. 329-358.

[11] Glezakos, M., Mylonakis, J. and Kafouros, C. (2012), **The Impact of Accounting Information on Stock Prices: Evidence from the Athens Stock Exchange**, International Journal of Economics and Finance, 4(2), pp. 56-68.
[12] Cañibano, L., García-Ayuso, M. and Sánchaz P. (2000), **Accounting for Intangibles: A literature review**, Journal of Accounting Literature, 19, p. 103.
[13] Francis, J. and Schipper, K. (1999), Op.cit., p. 323.
[14] Lev, B. and Zarowin, P. (1999), **The Boundaries of Financial Reporting and How to Extend Them**, Journal of Applied Corporate Finance, 37(2), pp. 353-385.
[15] Aboody, D. and Lev, B. (1998), **The value relevance of intangibles: The case of Software capitalization**, Journal of Accounting Research, 36, pp. 161-191.
[16] Landsman, W. R. and Maydew, E. L. (2001), **Beaver (1968) Revisited: Has the Information Content of Quarterly Earnings Announcements Declined in the Past Three Decades?**, p. 2, visited: 01/03/ 2014, http://dx.doi.org/10.2139/ssrn.204068 .
[17] Nayeri, M. D., Ghayoumi, A. F. and Bidari, M. A. (2012), **Factors Affecting the Value Relevance of Accounting Information**, International Journal of Academic Research in Accounting, Finance and Management Sciences, 2(2), p. 71.
[18] Barth, M. E., Beaver, W. H. and Landsman, W. R. (2001), **The relevance of the value relevance literature for financial accounting standard setting: another view**, Journal of Accounting and Economics, 31, p. 80.
[19] Check:
- Skinner, D. J. (2008), **Accounting for intangibles - a critical review of policy recommendations**, Accounting and Business Research, 38(3), pp. 191-204.
- Jaafar, H. (2010), **Accounting Choice, Firm Life-Cycle and the Value-Relevance of**
- **Intangible Assets**, Global Review of Accounting and Finance, 1(1), pp. 18-40.
- Zéghal, D. and Maaloul, A. (2011), **The accounting treatment of intangibles - A critical review of the Literature**, Accounting Forum, 35, pp. 262-274.

[20] Lev, B. and Zarowin, P. (1999), **The Boundaries of Financial Reporting and How to Extend Them**, Journal of Applied Corporate Finance, 37(2), pp. 353-385.

[21] Córcoles, Y. R. (2010), **Towards the convergence of accounting treatment for intangible assets**, Intangible Capital, 6(2), p. 186.
[22] Check:
- Daum, J. H. (2003), **Intangible Assets and Value Creation**, UK: John Wiley & Sons.
- Cohen, J. A. (2005), **Intangible Assets Valuation and Economic Benefit**, USA: John Wiley & Sons.
- Moore, L. and Craig, L. (2008), **Intellectual Capital in Enterprise Success: Strategy Revisited**, New Jersey, USA: John Wiley & Sons.

[23] Miller, M. H. and Modigliani, F. (1966), **Some estimates of the cost of capital to the electric utility industry 1954-57**, The American Economic Review, 3, pp. 333-391.
[24] Ball, R. and Brown, P. (1968), **An empirical evaluation of accounting income numbers**, Journal of Accounting Research, 6(2), pp. 159-178.
[25] Beaver, W. H. (1968), **The information content of annual earnings announcements**, Journal of Accounting Research, 6, pp. 67-92.
[26] Amir, E., Harris, T. S. and Venuti E. K. (1993), **A comparison of the value-relevance of U.S. versus non-U.S. GAAP accounting measures using form 20-F reconciliations**, Journal of Accounting Research, 31, pp. 230-264.
[27] Martinez, I. (2004), **Le contenu informatif des chiffres comptables : vers de nouvelles améliorations méthodologique ?**, Comptabilité - Contrôle - Audit, 2(10), p. 10.
[28] Beaver, W. (1998), **Financial reporting: an accounting revolution**. 3rd edition, Upper Saddle River: Prentice Hall.
[29] Check: Bicha, K. (2008), **Réaction des cours boursiers autour de la publication des indicateurs comptables : Cas de l'annonce des résultats annuels sur la bourse des valeurs mobilières de Tunis**, Recherches en comptabilité et finance, 1, p. 52.
[30] Francis, J. and Schipper, K. (1999), Op.cit., pp. 325-327.
[31] Yu, F. (2005), **Accounting transparency and the term structure of credit spreads**, Journal of Financial Economics, 75(1), pp. 53-84.
[32] Vernimmen, P. (2011), **Finance d'entreprise**, 9e édition, Paris: Dalloz, p. 52.
[33] Aboody, D. and Lev, B. (1998), Op.cit., p. 167.
[34] Deng, Z., Lev, B. and Narin, F. (1999), **Science and Technology as Predictors of Stock Performance**, Financial Analysts Journal, 55(3), pp. 20-32.
[35] Check: Martinez, I. and Raobadia, S. (2004), **Normes comptables internationales et capital immatériel : Une étude exploratoire à partir de deux cas de la « nouvelle économie »**, *In* 25e congrès de l'AFC sur le thème : Normes et mondialisation, France, p. 06.
[36] Sougiannis, T. (1994), **The accounting based valuation of corporate R&D**, The Accounting Review, 69(1), pp. 44-68.
[37] Aboody, D. and Lev, B. (1998), Op.cit., pp. 161-191.
[38] Seethamraju, C. (2003), **The value relevance of trademarks**, in Lev, B. and Hand, J., Intangible assets: values, measures and risks, NY: Oxford University Press, pp. 228-247.
[39] Goodwin, J. and Ahmed, K. (2006), **Longitudinal value relevance of earnings and intangible assets: Evidence from Australian firms**, Journal of International Accounting, Auditing and Taxation, 15, pp. 72-91.
[40] Zhao, R. (2002), **Relative Value Relevance of R&D Reporting: An International Comparison**, Journal of International Financial Management and Accounting, 13(2), pp. 153-174.
[41] Kallapur, S. and Sabrina, Y. S .K. (2004), **The value relevance and reliability of brand assetsrecognized by U.K. firms**, The Accounting Review, 79(1), pp. 151-172.
[42] AbuGhazaleh, N. M., Al-Hares, O. M. and Haddad, E. A. (2012), **The Value Relevance of goodwill impairments: UK Evidence**, International Journal of Economics and Finance, 4(4), pp. 206-216.
[43] Istrate, R. (2013), **IFRS adoption and the value relevance of goodwill and other intangible assets: U.K. empirical evidence, University of Amsterdam**, visited: 10/06/2013, available at: http://dare.uva.nl/document/490390.

[44] Garanina, T. and Pavlova, Y. (2011), **Intangible Assets and Value Creation of a Company: Russian and UK Evidence**, *In* Proceedings of 3rd European Conference on Intellectual Capital (pp. 165-175), UK: Academic Conferences and Publishing International Limited.
[45] Tsoligkas, F. and Tsalavoutas, I. (2011), **The value relevance of R&D in the UK after IFRS mandatory implementation**, Applied Financial Economics, 21(13), pp. 957-967.
[46] Oswald, D. and Zarowin, P. (2007), **Capitalization of R&D and the Informativeness of Stock Prices**, European Accounting Review, 16(4), pp. 703-726.
[47] Ding, Y. and Stolowy, H. (2003), **Capitalisation des frais de R&D en France : déterminants et pertinence**, *In* 24econgrès de l'AFC - Identification et maîtrise des risques : enjeux pour l'audit, la comptabilité et le contrôle de gestion, France.
[48] Loulou, S. and Triki, M. (2008), **Déterminants et pertinence de l'activation des dépenses de recherche and développement dans le contexte des entreprises françaises**, *In* 29e congrès de l'AFC - La comptabilité, le contrôle et l'audit entre changement et stabilité, France.
[49] Thibierge, C. (2001), **Actifs immatériels, valorisation boursière et contrainte d'endettement : étude empirique sur les marchés français et espagnol**, *In* 18e Journées Internationales de l'Association Française de Finance (AFFI), Belgium.
[50] Cazavan-Jeny, A. and Jeanjean, T. (2003), **Value Relevance of R&D reporting: a Signaling Interpretation**, Working paper 2003-12, CEREG, University Paris IX Dauphine, France.
[51] Jamoussi, W., Baklouti, M. A. and Affes, H. (2007), **La pertinence des intangibles dans l'évaluation des entreprises : cas du marché français**, *In* 28e Congrès de l'association Francophone de Comptabilité, comptabilité et environnement, France, 23-25 May.
[52] Lenormand, G. and Touchais, L. (2008), **La pertinence des actifs incorporels avec les IFRS**, Finance Contrôle Stratégie, 11(2), pp. 173-201.
[53] Boulerne, S. and Sahut, J. M. (2009), **Have IFRS improved the information content of intangibles?: The case of French listed companies**, *In* 32nd Annual Congress of the European Accounting Association, Tampere, Finland, 12-15 May.
[54] Casta, J. F. and Ramond, O. (2005), **Investissement en capital immatériel et utilité de l'information comptable : Étude comparative des marchés financiers britannique, espagnol et français**, Cahier de recherche No. 2005-07, CEREG, Université Paris - Dauphine, France.
[55] Sahut, J. M., Boulerne, S. and Frédéric T. (2011), **Do IFRS provide better information about intangibles in Europe?**, Review of Accounting and Finance, 10(03), pp. 267-290.
[56] Morricone, S., Oriani, R. and Sobrero, M. (2010), **The Value Relevance of Intangible Assets and the Mandatory Adoption of IFRS**, *In* 2010 American Accounting Association Annual Meeting and Conference on Teaching and Learning in Accounting, July 31 - August 04, USA.
[57] Ji, X. D. and Lu, W. (2014), **The value relevance and reliability of intangible assets: evidence from Australia before and after adopting IFRS**, Asian Review of Accounting, 22(3). pp.182-216.
[58] Oliveira, L., Rodrigues, L. and Craig, R. (2010), **Intangible assets and value relevance: Evidence from the Portuguese stock exchange**, The British Accounting Review, 42, pp. 241-252.
[59] Ohlson, A. J. (1995), **Earnings, book values and dividends in equity valuation**, Contemporary Accounting Research, 11(2), pp. 661-687.

To cite this article by the APA method :
Kimouche Bilal (2019), **Intangible Assets And Company's Market Valuation: The Case Study of Algerian listed companies**, El-Bahith Review, Volume 19 (Number 01), Algeria: Kasdi Marbah University Ouargla, pp. 577-590.