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Analysis of the information content of intangible assets: An empirical study on the WAEMU financial market

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Abstract: This research empirically analyzes the informational content of intangible assets in order to understand the perception of information related to intangible by the WAEMU financial market. Based on a cylindrical panel sample of 24 companies listed at the BRVM, observed over a 10-year period (2005-2014), the results first indicate that intangible assets are negatively and significantly associated with the stock market price. As a result, information inherent in intangible assets acts as a negative signal to investors in the regional financial market. Secondly, the economic depreciation of intangible assets is of little relevance for investors because no significant statistical link has been detected with either the stock price or the stock return. Finally, high immaterial density is negatively and significantly associated with stock market return. As a result, in the regional financial market, investors perceive the activation of intangible investments negatively. It acts as a negative signal to investors. Moreover, securities of intangible intensive companies are penalized by investors on this financial market. This assumes that intangible intensive and activating companies have low returns on their securities. This finding further confirms the hypothesis that investors seem to adopt a «myopic» vision or favour a short-term vision in the process of building their portfolio by penalizing companies that activate intangible investments in the short term. However, these results cannot be extrapolated due to the non-representativeness of the study sample.

Keywords: displacement panel, economic depreciation, informational content, intangible asset, signal, stock price, stock market return.

I. Introduction

Over the last thirty years, the internationalization of financial markets (Delgado-gomez et al., 2004; Nakamura, 2005), the growth of the knowledge-based economy (Garcia-Meca and Martinez, 2007), as well as the emergence of new information and communication technologies (Dufour and Zemzem, 2005; Charfi, 2006) have profoundly changed the nature of investments made by companies. This shift has led to a shift in sources of growth and competitiveness from traditional technical and financial capital in the classical economy to intangible capital, particularly intangible assets, in the new economy (Kasbaoui and Boussedra, 2012). As a result, this changing economic environment has encouraged companies to increase their intangible assets, such as research and development spending, patents, software and brands. These intangible assets are now recognized by the economic and financial community as elements of competitiveness. They are no longer just an advantage for gaining market share and generating wealth, but they have also become crucial elements in the knowledge-based economy.

Intangible assets recorded as balance sheet assets are classified as intangible assets, according to the conceptual framework of the International Accounting Standard Board (IASB). The IASB defines intangible assets as expenditures related to the acquisition, development, maintenance or enhancement of intangible resources such as scientific or technical knowledge, the design and implementation of new processes or systems, licenses, intellectual property, market knowledge and trademarks (including brand names and publication titles). According to the provisions of IAS (International Accounting Standards) 38, intangible assets are recorded as assets if one of the following criteria is met:

- The asset is identifiable and separable, that is, it may be segregated from the entity and may be sold, transferred, licensed, leased or exchanged, either individually or under contract, with related assets or liabilities;
- The asset is identifiable and results from contractual or other legal rights, whether or not such rights are transferable or separable from the entity or other rights and obligations.

The emergence of these new sources of wealth creation has legitimately led to efforts to normalize. However, despite these attempts at standardization, there has been much debate about how to account for and recognize intangible assets. This situation could potentially compromise the quality and relevance of the

information provided by companies' financial statements. Financial information related to intangible assets is thus subject to various criticisms (Bellalah et al., 2010). According to some researchers (Thibierge, 1997, 2001; Nils et al., 2000; Casta et al., 2007), accounting is criticized for its difficulty in identifying intangible elements and recognizing them as distinct resources on the one hand, as well as for its inability to correctly reflect the real value of these assets, resulting in increasingly large differences between the book values of companies and their market values, on the other hand. Other authors (Colins et al., 1997; Brown et al., 1999; Francis and Schipper, 1999; Lev and Zarowin, 1999; Goodwin and Ahmed, 2006) argue that given the growing interest of companies in intangible assets, traditional accounting standards, based on transactional principles, increasingly struggle to fulfill their informative role as decision-making aids (Lev, 2001a).

In fact, as Canibano et al. (2000) points out, information on intangible assets is often insufficiently detailed in companies' financial statements, partly because national accounting systems favour the principle of reliability of information over the principle of relevance. As a result, the information provided in the financial statements is insufficient to explain the relationship between the carrying amount and market value of the assets (Ohlson, 1995). Moreover, according to Casta et al (2007), these gaps in accounting information complicate the work of valuing intangible assets and, a fortiori, that of the securities of a company investing more its resources in the intangible. However, despite these criticisms, many authors (Megna and Klock, 1993, 2000; Chauvin and Hirschey, 1994; Sougiannis, 1994; Lev and Sougiannis, 1996; Lev and Zarowin, 1998; Barth and Karsnik, 1999; Barth et al., 2000; Lev et al., 2003; Cazavan-Jeny, 2003; Garcia-Meca and Martinez, 2007; Bellalah et al., 2010; Boulerne and Sahut, 2010, Maaloul and Zhégal, 2015) which strongly argue that accounting indicators for intangible assets contain information content and are therefore «value-relevant». Debates about the informational content of intangible assets are therefore controversial. Most studies on intangible assets have been conducted mainly in developed countries such as the United States, Germany, France, the United Kingdom, Spain, and others. It is undeniable that developed countries provide a favourable environment for this research because of their constant quest for innovation and technological development, with the aim of increasing their wealth and maintaining a dominant position. However, although the West is at the forefront of this revolution that generates performance and economic growth, it is not the only player concerned by this issue (Goldfinger, 1994). It is important to note that developing countries play a central role in increasing wealth through intangible resources (Kasbaoui and Boussedra, 2012b).

In this regard, this research opens the debate on how investors perceive and the accounting information communicated on intangible elements by companies on financial markets in emerging countries. Therefore, we formulate the following question: is the accounting information on intangible assets published by listed companies relevant or «value-relevant»? Or, do intangible assets contain – an informational content for investors on the financial market?

From this main question arises the following secondary questions:

- How do investors in the financial market perceive accounting information on intangible assets?
- How is the economic depreciation of intangible assets perceived by investors in the financial market?
- How do these investors perceive the intangible density of listed companies?

In this perspective, our study is part of the utilitarian approach of accounting information or «value-relevance approach» which aims to explain the difference between the market value of companies and their book value by intangible. This stream of research analyzes the effects of intangible on the stock market performance of companies measured by market variables. Accordingly, the main objective of this study is to analyze the informational content of intangible assets for investors in the financial market. It is therefore a question of understanding the perception of information on intangible assets by investors on the financial market. This will specifically be:

- Understand the perception of accounting information related to intangible assets by investors on the financial market.
- Examine the perception of the economic depreciation of intangible assets by investors in the financial market.
- Analyze the perception of the high density of intangible assets of companies by investors on the financial market.

Inscribing our study in the positivist paradigm, to verify our hypotheses and achieve the objectives set, we will carry out an econometric analysis of the data of companies listed on the Regional Stock Exchange of Abidjan covering 10 years from 2005 to 2014.

The contribution of this study lies in its attempt to reproduce the research conducted by Boulerne and Sahut (2010) by re-examining signal theory in the West African context. Indeed, the empirical studies cited

above were mainly based on American, but also European, Asian and Tunisian data. However, there is no guarantee that the outcomes and relationships identified can be directly applied to other environments, such as the West African Economic and Monetary Union (WAEMU) area. Differences in the regulation, culture, structure of financial markets and especially issues related to the accounting of intangible investments (Casta et al., 2007) make this transposition uncertain. Moreover, the results of previous research vary from one context to another. This leads to contradictions. Therefore, since the debate on the informational relevance of intangible assets is not closed, it is essential to analyze the informative content of these assets in the West African context.

Our study is organized into three sections. The first section deals with the literature review and study assumptions. The second section presents the methodology of the study. The last section focuses on empirical results.

II. Literature Review and Research Hypotheses

From a brief literature review on the informational content of intangible assets, we will formulate our research hypotheses.

2.1 Emergence of a new research stream: the "intangibles value–relevance studies"

Since the 1960s, research on the informational content of accounting data has been the main focus of researchers (Boulerne and Sahut, 2010). This current of research, also called «value-relevance», which establishes a link between the intangible and the financial markets, started from the observation of the deterioration of the usefulness of financial information. Certainly, authors such as Ball and Brown (1968) and Beaver (1968) have proven in their studies that the informational content of profits is correlated with stock price. However, the review of these studies led Lev (1989) to highlight the decline in the usefulness of annual and quarterly accounting results for investors. This is why, faced with the observation of the low relevance of accounting results, this stream of research has highlighted factors such as the increased importance of service or high-tech companies that invest in the intangible, the frequency and magnitude of non-recurring items and the impact of negative results that may explain the change in the relevance of results and book values.

Thus, for several decades, several studies have focused on the first explanatory factor and therefore, the relationship between intangible and financial markets. This empirical work has attempted to demonstrate that intangible investments contribute to the future performance of companies, being therefore assets, and therefore contain information content. In this perspective, many studies have followed, highlighting the relevance of the asset listing of these types of expenses by studying the association between intangible assets and the stock market price on the one hand, as well as with the stock return on the other hand.

2.1.1 Association between intangible assets and stock market prices

Several empirical studies have explored the relationship between intangible assets and stock prices in various contexts. Initially, in the American context, Hirschey (1982) and Hirschey and Connolly (1984) showed a positive correlation on average between research and development (R&D) spending and stock prices of American companies. Sougiannis (1994) demonstrated that there is a positive relationship between the share price and R&D spending, as well as a correlation between the stock's return and the increase in R&D investment. Using the Ohlson model (1995), Lev & Sougiannis (1996) confirmed these ideas by showing that equity and earnings were significantly linked to stock prices and returns when R&D spending was capitalized. Similarly, Aboody and Lev (1998) demonstrated that software development costs are reflected as assets in corporate stock prices and are significantly correlated with future results. These results suggest that, on average, investor's view R&D spending as depreciable assets rather than immediate expenses. The findings of the US studies have been corroborated in other empirical contexts. In France, the study by Cazavan-Jeny and Jeanjean (2004) of 93 French listed companies over the period 1998-2000 indicated that, all other things being equal, companies that capitalized their R&D expenses had higher equity returns and were better valued by the market than those that considered them expenses. This study showed a positive association between R&D capitalization and market variables (stock market returns, stock prices), as well as a negative or neutral relationship between the accounting of R&D expenses and these same market variables.

In a similar approach, Cazavan-Jeny and Jeanjean (2006) analyzed the impact of the accounting treatment of R&D expenses (capitalisation versus accounting for expenses) adopted by French companies on stock market returns. Their sample included 197 companies observed over a 10-year period, totaling 770 observations, of which 250 concerned companies opting for the capitalization of R&D expenditures. In contrast to American studies (Lev and Sougiannis, 1996; Aboody and Lev, 1998) and the previous French study (Cazavan-Jeny and Jeanjean, 2004), Cazavan-Jeny and Jeanjean (2006) identified a negative effect of information on the capitalization of R&D spending by French companies on the value of their shares. They

observed a negative association between the capitalization of R&D spending and market performance indicators. This trend was attributed to the specificity of the French context, where the choice of accounting method for the capitalization of R&D expenditures could be influenced by opportunistic behavior of French business leaders. This would have repercussions on the quality of the signal sent to investors and thus reduce the relevance of the accounting information provided.

2.1.2 Association between intangible assets and stock market return

Numerous studies have examined the relationship between equity performance and increased research and development (R&D) spending, influenced in part by the suggestions of Grabowski & Mueller (1978) which suggested that companies operating in research-intensive industries have above average returns for their intangible capital. Morck & Yeung (1991), following the work of Hirschey (1982), found that, on average, advertising and R&D costs positively and significantly influence market value. Using the Ohlson model (1995), Sougiannis (1994) demonstrated that increased R&D spending leads to an increase in profits over a period of at least 7 years. This positive correlation between R&D investments and future performance was highlighted by Sougiannis, suggesting that if R&D investments improve future performance and that a company's market value is largely based on the present value of that future performance, then a positive relationship should exist between the share price and R&D spending, as well as between the return on the stock and the increase in R&D investment. Lev & Sougiannis (1996) and Lev & Zarowin (1998), based on the Ohlson model, also confirmed a significant relationship between R&D capital and future equity returns, suggesting the existence of a valuation bias for companies with a high R&D intensity, or a compensation due to an additional risk related to the R&D activity itself. Chan et al. (2001) reinforced this hypothesis by showing that firms with high R&D expenditures (relative to their market value) tended to have lower past returns and "poor pricing" signals. They also found that R&D investments were linked to increased volatility, underscoring the need for increased communication on intangible assets to meet market needs. However, unlike some previous studies (Sougiannis, 1994; Lev & Sougiannis, 1996), Chan et al. (2001) failed to establish a direct relationship between the level of R&D spending and future equity returns.

The majority of studies conducted in the United States have shown that information related to intangible assets (R&D spending, software, advertising costs) is positively associated with stock prices and stock market returns. However, when these results are transposed into other contexts, particularly in France, contradictory conclusions are reached due to regulatory differences in the accounting of intangible assets. Cazavan-Jeny and Jeanjean (2004) noted that the perception of the positive contribution of intangible assets, particularly R&D costs, to value creation was obscured by an information asymmetry, which led to undervaluation of companies.

In the West African Economic and Monetary Union (WAEMU) space, there is to our knowledge no study specifically focused on the issue of the informational relevance of intangible assets, which have become essential levers of competitiveness and wealth creation in the modern economy. Due to the globalization of financial markets and the growth of intangible assets through new information and communication technologies, as well as the development of service activities, it is crucial to assess the informative content of these assets for investors in the regional financial market, taking into account its relatively small size.

2.2 Hypotheses of the Study

In accordance with the theoretical findings of signal theory and empirical studies (Cazavan-Jeny and Jeanjean, 2004; Boulerne and sahut, 2010; Bellalah et al, 2010), in order to analyze the informational content of intangible assets, we test the hypotheses set out below underside.

H1-Intangible assets are positively associated with stock price and stock yield

H1-1 Intangible assets are positively associated with the market price

H1-2 Intangible assets are positively associated with stock return

Inspired by the work of Bellalah et al. (2010), we propose to examine the relevance of the economic depreciation of intangible assets for investors intangible assets are intangible investments recorded on the balance sheet but which are identifiable unlike goodwill. Called intangible assets, these assets largely correspond to the intangible capital of companies. Specifically, intangible assets are comprised of identifiable elements only. Thus, in addition to impairment losses, depreciation on intangible assets describes the rate of consumption of future economic benefits from the use of these assets (Bellalah et al. 2010). Therefore, we consider that the amortization of intangible assets is negatively correlated with the market values studied in order to test the link between the economic depreciation of individualized intangible assets and the market value of listed companies.

Because of the sample chosen, the company profiles are very disparate in size but also in volume of intangible assets. Thus, the impact of intangible assets on market variables may depend on the importance of intangible elements for companies. Like Boulerne and Sahut (2010), in order to verify this hypothesis, we differentiate companies with a high density of total intangibles from others. To qualify as such, they must have a higher proportion of intangible assets relative to their balance sheet than the average of the sampled enterprises.

Accordingly, we state our third hypothesis as follows:
H3-High immaterial density has a positive impact on stock price and stock yield
H3-1 High immaterial density has a positive impact on stock price
H3-2 High immaterial density has a positive impact on stock yield

III. Study Methodology

After outlining our data collection procedure and presenting our sample, we will specify our methodology for analyzing the informational content of intangible assets for investors in the financial market in order to test our research assumptions.

3.1 Sample Selection and Data Collection Procedure

The sample frame consists of 39 public limited companies listed on the Regional Stock Exchange (BRVM) of Abidjan over a ten-year period between 2005 and 2014. Among the 39 listed public limited companies, we eliminated financial companies such as banks and leasing companies because of their accounting specificities and atypical operating methods in order to maintain a homogeneity of accounting standards. In addition, we decided to exclude from the sample companies that made their IPO during the study period or a year before the study period and those that exited the stock market before 2014. Indeed, newly listed companies have particular accounting behaviors and their valuation differs from other initially listed companies. For reasons of relevance, the companies publishing the consolidated financial statements have also been eliminated. Thus, at the end of the clearance process for 39 companies listed at the BRVM in 2005, 24 listed non-financial companies were selected as components of the research sample (Table 1).

Ultimately, the research hypotheses will be tested on a sample of cylindrical panel data of 240 observations (company-year) over the period studied. In econometrics, a panel is called displacement when each individual is observed for the same set of periods. In addition, the information was collected on secondary data consisting mainly of summary financial statements (balance sheets, income statements, financing tables for resources and uses), annual management reports, monthly bulletins for the months of December and stock prices published on the WAEMU stock market from 2005 to 2014.

Table 1- Study sample

Number of companies in the BRVM's market portfolio in 2005	39
- financial companies	06
- companies which made their initial public offering during the study period or one year before that period	01
- companies that did not enter intangible investments in the financial statements over the study period	01
- companies that exited the stock exchange or were acquired before 2014	06
- companies publishing only consolidated financial statements	01
Sample companies for a statistical study	**24**

Source: From BRVM data

3.2 Study Models

In order to understand the informational content of intangible assets by investors on the regional financial market, we will study the association between intangible assets and the stock market price on the one hand, and on the other hand with the stock market yield.

3.2.1 Stock Price Modelling

In order to examine the perception of investors on the regional stock market of information on intangible elements through published financial statements, we draw on a model frequently used in empirical research. This model examines the relationship between the price of securities (P) and the carrying amount of equity per common share (NPPS) and net earnings per share (EPS). This model was motivated by theoretical work on the valuation models of Feltman and Ohlson (1995) which specify that the market value of a company is a function of its profit, equity and any other relevant information. Moreover, several empirical works (Aboody and Lev,

1998; Zhao, 2002; Cazavan-Jeny and Jeanjean, 2004; Bouden, 2006; Boulerne and Sahut, 2010), in order to understand the relevance of accounting information for intangible investments on the US and European financial markets, the model of Ohlson (1995) was used. Thus, in the light of the work of Cazavan-Jeny (2003) Cazavan-Jeny and Jeanjean (2004), Bouden (2006) and Boulerne and Sahut (2010) who studied the informational relevance of intangibles for the French financial markets, we specify and formalise our first model as follows:

$$P_{i,t} = b_o + b_1 GIAPS_{i,t} + b_2 NIAPS_{i,t} + b_3 AMORTIA_{i,t} + b_4 NPPS_{i,t} + b_5 EPS_{i,t} + b_6 ARCT_{i,t} + b_7 L\text{-}MV_{i,t} + b_8 Beta_{i,t} + b_9 HDGIA_{i,t} + \underline{\varepsilon}_{i,t} \quad (M\text{-}P)$$

With:

- Pi,t: price of a share of the company i, 6 months after the closing date of the accounting year t because on the stock market of the WAEMU area, the publication of the financial statements is mandatory at this period
- $GIAPS_{i,t}$: the accounting measure of gross intangible assets in relation to the total number of shares of company i for the accounting year t
- $NIAPS_{i,t}$: the accounting measure of net intangible assets in relation to the total number of shares of company i for the accounting year t
- $AMORTIA_{i,t}$: the carrying amount of the amortization of intangible assets in relation to the total number of shares of company i for the accounting year t
- NPPSi,t: net profit per share of the company i for the accounting year t
- $EPS_{i,t}$: the carrying amount of the company's equity per share i for the accounting year t
- $ARCT_{i,t}$: Annuel rate of change in turnover of the company i at the end of the accounting year t
- $Beta_{i,t}$: the risk measured by the beta of company i's CAPM for period t (Cazavan-Jeny, 2003)
- $L\text{-}MV_{i,t}$: the logarithm of the market value of the company i at 30 June after the end of the accounting year t (Cazavan-Jeny, 2003);
- $HDGIA_{i,t}$:high density of gross intangible assets of the company i at the end of the accounting year t: silent variable equal to 1 if the company i has gross intangible assets above the sample average and 0 otherwise
- $\varepsilon_{i,t}$: Other information relevant to the company i at the end of the accounting year t

According to Boulerne and Sahut (2010), this valuation model has the advantage of using accounting data as an approximation of the discounted future cash flows expected by investors and thus the market value of a firm. We expect that gross intangible assets, net assets and intangibles density are positively correlated with the market price and that depreciation that expresses the economic depreciation of intangibles is negatively correlated with the market price. Indeed, if the intangible assets for the gross, net values, the density in intangibles each year so their depreciation are «value-relevant» then their respective coefficients b1, b2 and b9 in the regression (M-P) should be significant and positive and the b3 coefficient negative. As part of this regression, several control variables are integrated into the model (M-P) in order to control factors other than intangible assets and their depreciation that could influence stock prices. Indeed, as pointed out by Cazavan-Jeny (2003), Brown, Lo and Lys (1999) show that statistical associations identified by the decline in stock prices suffer from a scale effect. Or, higher stock prices tend to be systematically correlated with higher book values and earnings per share and vice versa. Thus, the informational relevance (value-relevance) measured by the R Square of the stock price regression is recklessly overestimated and it is absolutely necessary to control this scale effect by including the size and growth of the company as control variables.

Therefore, as control variables in the stock price regression model, we retain:

- The size, measured by the logarithm of the market value (L-MV) of the company (Cazavan-Jeny and Jeanjean, 2004; Bouden, 2006) to control the scale effect;
- The growth of the company measured by the annual rate of change in turnover (ARCT) to control the scale effect (Cazavan-Jeny, 2003)
- Risk, such as Cazavan-Jeny (2003) and Cazavan- Jeny and Jeanjean (2004) to control the risk of listed companies because risk and result are closely linked (French and Fama, 1992)

3.2.2 Stock Market Return Modelling

Still with a view to analyzing the perception of information on intangible assets by investors on the WAEMU regional market and to confirm the robustness of our results as suggested by Easton (1999, cited by Boulerne and Sahut, 2010), we test a second model that links stock market returns (R) to changes in the book

values of gross intangible assets per share (ΔGIAPS), net intangible assets per share (ΔNIAPS) and amortization of intangible assets per share (ΔAMORTIA), in addition to changes in net earnings per share (ΔNPPS) and adjusted equity (ΔEPS).

Based on recent empirical work by Boulerne and Sahut (2010), this model is presented as follows:

$$R_{i,t} = c_0 + c_1 \Delta GIAPS_{i,t} + c_2 \Delta NIAPS_{i,t} + c_3 \Delta AMORTIA_{i,t} + c_4 \Delta NPPS_{i,t} + c_5 \Delta EPS_{i,t} ++ c_6 ARCT_{i,t}\, c_7\, beta_{i,t} + c_8 L\text{-}MV + c_9 HDST_{i,t} + \underline{\varepsilon}_{i,t} \quad (M\text{-}R)$$

With:

$R_{i,t}$: Stock return of the company i, 6 months after the closing date of the accounting year t. Ri,t =(Pi,t –Pi,t-1+Dividends,t) / Pi,t-1 where P is the price of the share 6 months after the closing date of the year t

- $\Delta GIAPS_{i,t}$: Change in the carrying amount of gross intangible assets per share of the company i at year end t
- $\Delta NIAPS_{i,t}$: Change in the carrying amount of net intangible assets per share of company i at year end t
- $\Delta AMORTIA_{i,t}$: Change in the carrying amount of depreciation per share of the intangible assets of the company i at year end t
- $\Delta NPPS_{i,t}$: Change in net profit per share of the company i in year t
- $\Delta EPS_{i,t}$: Change in the carrying amount of the company's equity per share i at year end t
- $Beta_{i,t}$: the risk measured by the beta of company i's CAPM for period t
- $L\text{-}MV_{i,t}$: the logarithm of the market value of the company i at 30 June after the closing date of the accounting year t;
- $HDGIA_{i,t}$: high density of gross intangible assets of the company i at the end of the accounting year t: silent variable equal to 1 if the company i has gross intangible assets above the sample average and 0 otherwise.
- $\varepsilon_{i,t}$: Other information relevant to the company i at the end of the accounting year t.

We hope that the change in gross intangible assets, the change in net intangibles and the density in intangibles are positively correlated with the stock return and the change in depreciation that expresses the economic depreciation of intangibles is negatively correlated with the stock return.

In fact, if the variations of the intangible assets for the gross, net values, the density in intangibles each year so their depreciation are «value-relevant» then their respective coefficients c1, c2 and c9 in the regression (M-R) should be significant and positive and the b3 coefficient negative.

IV. Results and Discussions

We first present the univariate results, then the bivariate results and finally the results of the multivariate analysis.

Before discussing the results of the multivariate analysis, it is advisable first of all to carry out a univariate analysis presenting the characteristics of the sample and secondly, to conduct a bivariate analysis to explore possible correlations between the different variables studied. This preliminary analysis aims to observe the evolution of variables over time of our variables of interest and to identify possible links between them. Thus, this section is dedicated to the presentation of the results of univariate and bivariate statistical tests to the whole sample over the study period from 2005 to 2014.

4.1.1 Results of the univariate analysis

Our observation focuses on the study of the evolution of the characteristics of the companies studied over the period of analysis (2004-2014). Indeed, the examination of the evolutions of the statistics makes it possible to better understand the evolutions of the characteristics of the enterprises of the sample throughout the period of study. Thus, we examine the evolution over the study period on the one hand, the variables of the immaterial and their depreciation over time and on the other hand, the market variables that are stock market indicators (stock price and stock market performance). We hope to detect similarities between the variation of immaterial and the evolution of stock market indicators, which may indicate the existence of a causal relationship between the two phenomena. The evolution of the NIAPS ratio reflecting the amount of net intangible assets per share presents two phases: a phase of decline from 2005 to 2007 and the second phase of regular and continuous growth from 2007 to 2014. Looking at Figure 1, we see an almost similar evolution of the NIAPS ratio and the AMORTA ratio reflecting the amount of depreciation applied to activated intangible but per share. The evolution of the

NPPS ratio is similar to that of the NIAPS ratio. Indeed, for the GIAPS ratio, we see a continuous and steady increase until 2008, then a decrease in 2009 to resume the upward trend until 2013 and fall in 2014.

Addressing the evolution of market variables, on the one hand, we observe similarities between the evolution of the stock price and that of the stock return. And this similarity in the variation of the two stock market indicators presents 3 phases. Indeed, the first phase is marked by a steady increase until 2007. From 2007, the second phase begins, which translates into a decline until 2010. The last stage, for its part, is devoted to a steady and continuous increase until 2013 and a decline in 2014. Moreover, we note that the evolution of the stock price presents similarities over the study period with that of the GIAPS and AMORTIA ratios. In addition, Graphs 1 and 2 show similarities between the change in the NIAPS ratio and the change in the GIAPS ratio.

Thus, it emerges from this analysis, the existence of a certain similarity in the evolution of intangible assets. However, by jointly analyzing the evolution of intangible variables as well as the evolution of stock market indicators, we did not detect similarities in the curves schematizing the two phenomena over the study period. This finding does not seem to give any signal for the validation of our research hypotheses. Therefore, in the following paragraph, in order to detect a causal relationship between the intangible variables and the market variables that are the stock price and the stock return, we will refine the analysis by a bivariate analysis.

Chart n°1: Evolution of intangibles Investments and the stock market price

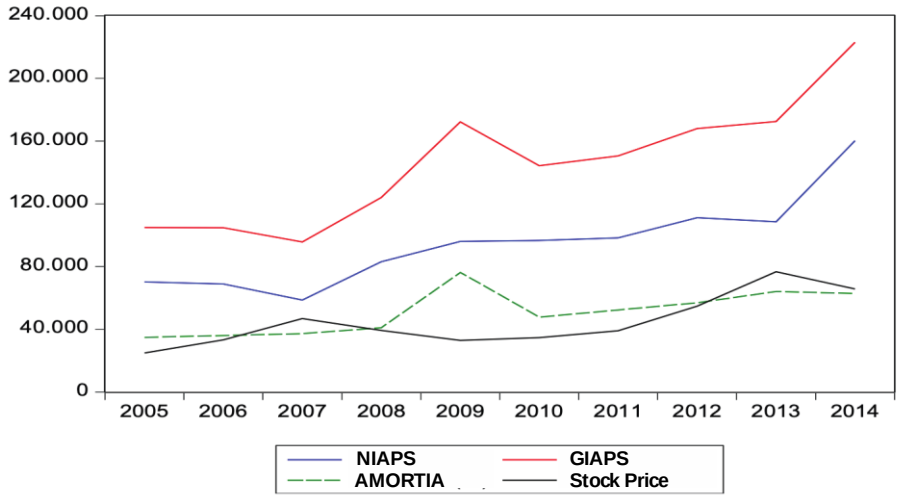
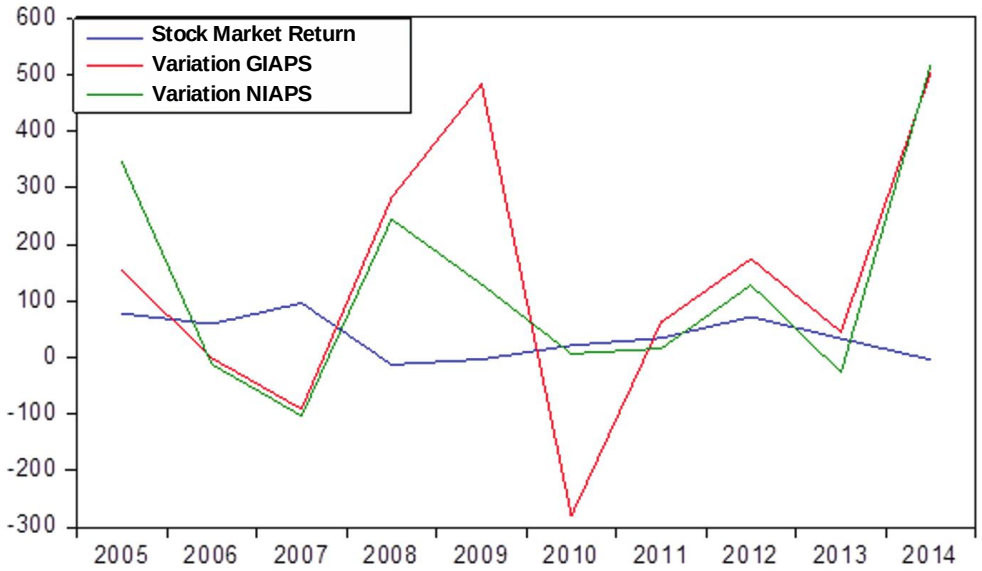


Chart 2: Evolution of intangible investments and stock market return



Source: Author

We now study the bivariate correlations between the different variables of the research. Indeed, through bivariate analysis, we try to understand the relationships between two variables, especially the relationships between endogenous and exogenous variables. To do this, we use the Spearman non-parametric test to identify explanatory variables with strong correlations between them in order to rule out multicollinearity problems.

Thus, the variables being quantitative, we use the Spearman correlation coefficient as mentioned above and the significance of the correlations is tested with the student t test. The hypotheses tested are as follows:

- H0: no relationship between the two variables
- H1: existence of a linear relationship between the two variables

H0 is accepted when the P-value is greater than 5%, otherwise H1 is accepted.
We will present the bivariate correlations between the stock price and the exogenous variables of the M-P model on the one hand, and between the stock return and the exogenous variables, on the other hand.

4.1.2.1 Bivariate correlations between stock price and exogenous variables of the M-P model

The analysis of the correlation matrix (Table 2) shows that there is a positive and significant association between each of the intangible asset variables (GIAPS, NIAPS) and their economic depreciation (AMORTIA) and the stock market price at the threshold of 5%. This suggests that an increase in intangible assets and the depreciation applied to these intangible assets leads to an upward change in the stock price. Indeed, the publication of activated intangible investments and their economic depreciation in the individual financial statements by companies on the regional financial market would be a signal for investors on the future performance of the company having invested in immaterial.

Table 2: Results of bivariate correlations between stock price and variables independent of the M-P model

Variables	N	Price	Significativité
GIAPS	240	0,449	7,753***
NIAPS	240	0,312	5,067***
AMORTIA	240	0,339	5,562***
NPPS	240	0,751	17,571***
EPS	240	0,685	14,519***
ARCT	240	0,183	2,865***
L_MV	240	0,674	14,076***
BETA	240	0,111	1,719*
HDGIA	240	0,099	1,531

Source: Author

- Pi,t: share price of the company
- GIAPSi,t: the accounting measure of gross intangible assets in relation to the total number of shares of the company
- NIAPSi,t: the accounting measure of net intangible assets in relation to the total number of shares of the company
- AMORTIAi,t: the carrying amount of amortization of intangible assets as compared to the total number of shares of the company
- NPPSi,t: the company's net profit per share
- EPSi,t: the book value of the company's equity per share
- $ARCT_{i,t}$: Annuel rate of change in turnover of the company i at the end of the accounting year t
- Betai,t: the risk measured by the company's CAPM beta
- L-Mvi,t: the logarithm of the company's market value
- HDGIAi,t:high density of the company's gross intangibles

:Correlation is significant at a threshold of 1%
:Correlation is significant at 5% threshold
:Correlation is significant at 10% threshold
N: number of observations

4.1.2.2 Bivariate Correlations between Stock Market Return and M-R Model Intangible Asset Variables

An examination of the bivariate correlations between stock market performance and intangible asset variables in the M-R model (Table 3) shows that there is no significant relationship between these variables (ΔGIAPS, ΔNIAPS, ΔAMORTIA) and stock market performance. The increase in gross and net values of intangible investments as well as their amortization has no significant impact on the return of securities. This observation seems to refute our third hypothesis (H3). As for the variable of intangible HDGIA expressing the density in intangibles of the companies, this one influence negatively, but weakly the return of the shares of the listed companies. This assumes that intangible intensive and activating companies have low returns on their securities. This finding corroborated the hypothesis that investors seem to adopt a «myopic» vision or favour a short-term vision in the process of building their portfolio by penalizing companies that activate intangible investments in the short term. Indeed, several authors (Porter, 1992; Hall, 1993; Casta et al, 2007) argue that investors in financial markets are blinded by their short-term return horizon and have, consequently, difficulty in perceiving and integrating into their investment choice process, the additional future returns inherent in long-term investments. So, investors in the regional financial market of WAEMU would penalize these companies. This argues in favor of invalidating our third hypothesis (H3-2).

Moreover, this analysis is not robust enough to comment on the validation of our research hypotheses. Accordingly, in the next section, we will conduct a multivariate analysis to test our research hypotheses.

Table 3: Results of bivariate correlations between Stock Market Return and independent variables of the M-R model

Variables	N	Stock market return	Significativité
Δ_GIAPS	240	0,062	0,954
Δ_NIAPS	240	0,038	0,594
Δ_AMORTIA	240	0,057	0,873
Δ_NPPS	240	0,290	4,668***
Δ_EPS	240	0,249	3,961***
ARCT	240	0,164	2,560**
L_MV	240	0,045	0,695
BETA	240	(0,091)	(1,403)
HDGIA	240	(0,035)	(0,539)

Source: Author

With:

$R_{i,t}$: Stock return of the company i, 6 months after the closing date of the accounting year t. Ri,t =(Pi,t –Pi,t-1+Dividends,t) / Pi,t-1 where P is the price of the share 6 months after the closing date of the year t

- $\Delta GIAPS_{i,t}$: Change in the carrying amount of gross intangible assets per share of the company i at year end t
- $\Delta NIAPS_{i,t}$: Change in the carrying amount of net intangible assets per share of company i at year end t
- $\Delta AMORTIA_{i,t}$: Change in the carrying amount of depreciation per share of the intangible assets of the company i at year end t
- $\Delta NPPS_{i,t}$: Change in net profit per share of the company i in year t
- $\Delta EPS_{i,t}$: Change in the carrying amount of the company's equity per share i at year end t
- $ARCT_{i,t}$: Annuel rate of change in turnover of the company i at the end of the accounting year t
- $Beta_{i,t}$: the risk measured by the beta of company i's CAPM for period t
- $L\text{-}MV_{i,t}$: the logarithm of the market value of the company i at 30 June after the closing date of the accounting year t;
- $HDGIA_{i,t}$: high density of gross intangible assets of the company i at the end of the accounting year t: silent variable equal to 1 if the company i has gross intangible assets above the sample average and 0 otherwise.
- $\varepsilon_{i,t}$: Other information relevant to the company i at the end of the accounting year t.

4.2 Results of the regression

4.2.1 Stock Price econometric model estimation results (M-P)

From the econometric model of the stock market price (M-P), we have retained three equations (M-P1, M-P2, M-P3) because of the bivariate correlations between the intangible asset variables (NIAPS, GIAPS, AMORTIA). Hausman test indicates that the fixed-effect (EF) model is the optimal model to test the effect of intangible assets as well as their depreciation on the stock market price in order to understand the perception of intangible investments by investors on the regional financial market of WAEMU.

The results of the estimation of the equations (M-P1, M-P2, M-P3) of the Exchange Rate Econometric Model (Table 4) are related to the coefficients and standard statistics of the MCO regression of the Exchange Rate Econometric Model. Indeed, the results of the stock price regressions on the explanatory variables of each equation first indicate relative Fisher statistics for each estimate with a significance at the threshold of 1%. This reflects a good fit quality of the estimated models. Then, the adjusted R2 coefficients of determination, measuring the proportion of the variation of the endogenous variable that is explained by the exogenous variables in the three equations M-P1, M-P2 and M-P3 estimated are respectively 0.842; 0.840 and 0.839. This highlights a good prediction associated with our Stock Price Econometric Model equations.

Therefore, on the basis of these results, we can say that the exogenous variables of the equations explain a very significant proportion (in the order of 84%) of the variation of the stock price of the companies at the BRVM that make up our sample. Finally, Table 4 presents the regression coefficients of our independent variables of interest as well as those of the control variables. Indeed, the estimation results of equation M-P1 show that the regression coefficient of the variable AINA (amount of net intangible assets per share) has the opposite of the expected sign (-3,191) and is statistically significant (t=-2,177) at the threshold of 5%. It then appears that intangible assets not yet depreciated have a negative and significant impact on the price of securities. We deduce information on intangible assets is not useful for the financial market. This information is, therefore, negatively valued on the WAEMU financial market by investors. The activation of these intangible in the balance sheet is a real signal of the future performance of listed companies towards investors on the West African financial market in order to reduce the informational asymmetry. However, this signal on intangible elements is poorly perceived by investors and therefore is not valued by them. To this end, we can conclude that investors on the WAEMU financial market penalize the security of a company that invested in intangible capital during the period, in accordance with studies conducted on the French financial market (Cazavan and Jeanjean, 2006; Boulerne and Sahut, 2010). On the other hand, the regression results of the equation M-P2 (EF) denote a regression coefficient of the variable GIAPS (amount of gross intangible assets per share) of negative sign (-1.897) contrary to what was expected, but not statistically significant (t=-1,427). This reflects a negative but insignificant impact of gross intangible assets on the price of shares. This finding reveals that investors on the BRVM have difficulty perceiving information on the gross mass of intangible investments activated as carrying future economic benefits for companies, and thus a source of wealth creation.

As for the estimation results of equation M-P3, we note a regression coefficient of the variable AMORTIA (amount of depreciation per share practiced on intangibles) positive (3.784) and not statistically significant (t=1.272). This suggests that the amount of the intangible positively influences the stock price and this in a non-significant way. This shows the lack of interest in the WAEMU financial market for the level of benefits and performance already acquired by the company due to the exploitation of intangible investments made. Moreover, the insignificance of the positive link between the economic depreciation of intangibles and the stock market price indicates that the informative value related to the rate of use of intangibles is non-existent for investors on the regional financial market.

In view of the results obtained, the H2-1 and H3-1 hypotheses are partially validated contrary to the H1-1 hypothesis, which, meanwhile, is invalidated.

Table 4: Estimation results of the equations of the M-P model (M-P1, M-P2, M-P3) analyzing the effect of intangible investments on the stock price

			M-P1		M-P2		M-P3	
Variables	**N**		**FE**	**RE**	**FE**	**RE**	**FE**	**RE**
GIAPS	**240**	**coef**	NI		-1,897	-1,765	NI	
		T-stat			(-1,427)	(-1,419)		
AMORTIA	**240**	**coef**	NI		NI		3,784	2,943
		T-stat					(1,272)	(1,053)
NIAPS	**240**	**coef**	-3,191**	-2,738**	NI		NI	

		T-stat	(-2,177)	(-1,977)				
NPPS	**240**	**coef**						
		T-stat						
EPS	**240**	**coef**	0,505**	0,971***	0,479**	0,947***	0,408*	0,876***
		T-stat	(2,154)	(4,871)	(2,023)	(4,692)	(1,735)	(4,352)
HDGIA	**240**	**coef**					-5918,38	-8490,90
		T-stat					(-0,744)	(-1,153)
ARCT	**240**	**coef**	4370,634***	4953,87**	4572,11***	5147,13***	3943,48**	4673,84***
		T-stat	(2,641)	(3,023)	(2,728)	(3,109)	(2,311)	(2,777)
BETA	**240**	**coef**						
		T-stat						
L_MV	**240**	**coef**	22681,16***	19692,62***	22816,5***	19697,11***	23541,3***	20111,09***
		T-stat	(5,634)	(6,425)	(5,622)	(6,354)	(5,800)	(6,363)
Constante	**240**	**coef**	-5,02E05***	-4,4E05***	-5,05E05*** 4,3E05***	-	-5,2E05***	-4,5E05***
		T-stat	(-5,263)	(-6,076)	(-5,251)	(-6,004)	(-5,450)	(-6,034)
Adjusted R-Square	**240**		**0,842**	**0,408**	**0,840**	**0,403**	0,839	0,399
Fisher Test	**240**	**F-stat**	36,635***	13,706***	36,085***	13,449***	34,895***	12,367***
		P-value	0,000	0,000	0,000	0,000	0,000	0,000
Hausman Test	**240**	**Chi-2 stat**	22,996***		20,809***		19,364***	
		P-value	0,000		0,000		0,001	

Results of the estimation of the equations of the econometric model of the Stock Price

With:
M-P1 (FE): Pi,t = bo + b1NIAPSi,t + b2 NPPSi,t + b3ARCTi,t +b4L-MVi,t,t + Ɛi,t.
M-P2 (FE): Pi,t = bo + b1GIAPSi,t + b2EPSi,t + b3ARCTi,t +b4L-VMi,t + Ɛi,t.
M-P3 (FE): Pi,t= bo + b1 AMORTIAi,t + b2EPSi,t + b3ARCTi,t +b4L-MVi,t + b5HDGIAi,t + Ɛi,t.
Note: (*), (**), (***) indicate the significance of the coefficient associated with the variable at the respective thresholds of 10%, 5% and 1%.
ns = not significant
ns = not significant
NI=indicates that the variable was not explicitly introduced into the model
The empty space in front of a variable for a given model means that it does not appear in the optimal model; it is statistically insignificant and leads to degrade the quality of the optimal model.
Finally, a coefficient without the symbol (*) means that it is not significant
FE: fixed effect model
RE: random effect model
M-P: Econometric model to analyze the effect of intangible investments on stock prices
M-P1: Model for analyzing the effect of net intangible assets on stock prices
M-P2: Model for the analysis of the effect of gross intangible assets on stock prices
M-P3: Model for analyzing the effect of depreciation associated with intangibles on the stock price.

The associations between the selected intangible asset variables and the stock market price evidenced from the estimation of the M-P econometric model equations are summarized in Table 6 below.

Table 6: Summary of the results of the econometric regression on the stock price

Independent variables	**Variable indicators**	**Abbreviations**	**Influence on the stock price**
Intangible investment	**Gross intangible assets per share**	**GIAPS**	**Negative (ns)**

variables	**Net intangible assets per share**	**NIAPS**	**Negative (sig)**
	Amortization of intangible assets per share	**AMORTIA**	**Negative (ns)**
Control variables	**Carrying amount of equity per share**	**EPS**	**Positive (sig)**
	Growth in activity	**ARCT**	**Positive (sig)**
	Size of the company	**L_VM**	**Negative (sig)**
	High density intangibles	**HDGIA**	**Positive (ns)**

Source: Author

With:
ns: not significant
sig: significant

4.2.2 Market Return Econometric Model Estimation Results (M-R)

Table 7 shows the coefficients and their significance thresholds for regressions with the Least Ordinary Square (MCO) of the equations (M-R1, M-R2, M-R3) on stock market yield. In addition, the Hausman test indicates that the fixed-effect model is adequate to analyze the impact of intangible assets, as well as their amortization, on stock market return. This table shows that the adjusted coefficients of determination R-Square of the three equations are on average in the order of 38% (0.378; 0.385; 0.38) and are statistically significant at the threshold of 1%. These adjusted R-Square remain reasonably within the average of those documented by the literature on the impact of intangible on stock market performance in order to assess the informational relevance of intangible for financial markets. This reflects a good prediction associated with our econometric model equations of stock market return. Therefore, on the basis of these results, we can say that the exogenous variables of the equations explain a very significant proportion (in the order of 38%) of the variation of the stock return of the companies listed at the BRVM that make up our sample.

Moreover, the estimation results of the three equations show regression coefficients of the immaterial variables (**Δ**NIAPS, **Δ**GIAPS) and their damping (**Δ**AMORTIA) very low and positive, but not significant. This finding suggests that changes in intangible investments as well as their amortization impact positively but weakly the return of securities. We can infer from this that investors seem to continue to pay no attention to intangible assets, as well as their rate of use or consumption on the BRVM. They believe that intangible assets are not very rent-generating and therefore their contribution to shareholder value is low. In the West African context, investors do not perceive identifiable intangible assets as sources of value according to the studies of Ding & Stolowy (2003), Cazavan & Jeanjean (2006), Casta et al (2007) and Boulerne & Sahut (2010) carried out in the French context. In the WAEMU regional financial market, investors also do not perceive capitalised intangible assets as a source of value or annuity generators unlike US studies (Hirschey 1982; Lev and Sougiannis 1996; Lev & Zarowin 1998; Aboody and Lev 1998). Since capitalization of intangible assets is not useful for investors, it does not, therefore, respond to concerns about managing the result but rather to a concern to communicate information to the financial market. Authors such as Porter (1992), Hall (1993) and Casta et al, (2007) rightly argue that investors in financial markets are blinded by their short-term return horizon and have consequently, difficulty in perceiving and integrating into their investment choice process, the additional future returns inherent in long-term investments.

This is why shareholders in the West African financial market value intangible intensive companies negatively. This idea is supported by the regression coefficient of the variable HDST (High density in intangibles) which is negative and statistically significant at the threshold of 1% in the three equations of the econometric model of stock market return. As a result, we can say that the West African financial market penalizes intangible intensive societies. Furthermore, when we discriminate against companies according to their density of intangible assets, we find that this criterion explains negatively and significantly the stock market return. In other words, the negative contribution of intangible to the shareholder value of companies encourages investors in the West African context to penalize the securities of companies intensive in intangible, unlike the studies of Boulerne and Sahut (2010) on the French financial market. This finding in the West African context is similar to the studies of Chan et al (1990) which provides evidence of a poor evaluation of intangible intensive societies, more specifically in R&D. In view of these findings, we can state that the hypotheses H1-2 and H2-2 are partially confirmed and invalidated respectively. In contrast, the H3-2 hypothesis is invalidated.

Table 7: Estimation results of the equations of the M-R model (M-R1, M-R2, M-R3) analysing the effect of intangible investments on stock market return

			M1		M2		M3	
Variables	**N**		**FE**	**RE**	**FE**	**RE**	**FE**	**RE**
ΔGIAPS	**240**	**coef**	NI		4,45 E-05	3,67 E-05	NI	
		T-stat			(1,597)	(1,446)		
ΔAMORTIA	**240**	**coef**	NI		NI		4E-06^{ns}	3E-06^{ns}
		T-stat					(0,835)	(0,694)
ΔNIAPS	**240**	**coef**	1,4 E-05	2,3 E-05	NI		NI	
		T-stat	(0,371)	(0,689)				
ΔNPPS	**240**	**coef**						
		T-stat						
ΔEPS	**240**	**coef**						
		T-stat						
HDGIA	**240**	**coef**	-0,511***	-0,143	-0,589***	-0,140*	-0,498***	-0,160*
		T-stat	(-2,889)	(-1,624)	(-3,340)	(1,660)	(-3,006)	(-1,724)
BETA	**240**	**coef**	-0,057*	-0,003	-0,058*	-0,0003	-0,060*	-0,010
		T-stat	(-1,662)	(-0,099)	(-1,720)	(-0,010)	(-1,741)	(-0,312)
L_MV	**240**	**coef**	0,423***	0,061**	0,426***	0,058**	0,424***	0,072**
		T-stat	(4,800)	(2,210)	(4,872)	(2,176)	(4,827)	(2,387)
Constante	**240**	**coef**	-9,562***	-1,064	-9,618***	-0,978	-9,589***	-1,318*
		T-stat	(-4,553)	(-1,617)	(-4,618)	(-1,560)	(-4,582)	(-1,835)
Adjusted R^2	**240**		0,378	0,281	0,385	0,281	0,380	0,289
Fisher Test	**240**	**F-stat**	5,046***	8,198***	5,173***	8,216***	5,076***	8,486***
		P-value	0,000	0,000	0,000	0,000	0,000	0,000
Hausman Test	**240**	**Chi-2 stat**	37,294***		43,396***		31,296***	
		P-value	0,000		0,000		0,000	

Results of the estimation of the equations of the econometric model of Stock Market Return,

With:

M-R1 (FE): $R_{i,t} = c_0 + c_1\Delta NIAPS_{i,t}$,+ $c_2 HDGIA_{i,t} + c_3\ beta_{i,t} + c_4 L\text{-}MV_{i,t} + \varepsilon_{i,t}$

M-R2 (FE): $R_{i,t} = c_0 + c_1\Delta GIAPS_{i,t}$,+ $c_2 HDGIA_{i,t} + c_3\ beta_{i,t}$+ $c_4 L\text{-}VM_{i,t} + \varepsilon_{i,t}$

M-R3 (FE):$R_{i,t}= c_0 + c_1\Delta AMORTA_{i,t}$,+ $c_2 HDGIA_{i,t} + c_3\ bêta_{i,t}$+ $c_4 L\text{-}VM_{i,t} + \varepsilon_{i,t}$

Note: (*), (**), (***) indicate the significance of the coefficient associated with the variable at the respective thresholds of 10%, 5% and 1%.

ns = not significant

ns = not significant

NI=indicates that the variable was not explicitly introduced into the model

The empty space in front of a variable for a given model means that it does not appear in the optimal model; it is statistically insignificant and leads to degrade the quality of the optimal model.

Finally, a coefficient without the symbol (*) means that it is not significant

FE: fixed effect model

RE: random effect model

M-R: Econometric model to analyze the effect of intangible investments on stock market return

M-R1: Model for the analysis of the effect of net intangible assets on stock market returns

M-R2: Model for the analysis of the effect of gross intangible assets on stock market return

M-R3: Model for analyzing the effect of depreciation associated with intangibles on stock market return.

The effects of the independent variables selected on the Stock Market Return highlighted from the estimation of the equations of the econometric model M-P are set out in Table 8 below.

Table 8: Summary of the results of the econometric regression on stock market return

Independent variables	Variable indicators	Abbreviations	Influence on stock market return
Intangible investment variables	**Change in gross intangible assets per share**	**ΔGIAPS**	**Negative (ns)**
	Change in net intangible assets per share	**ΔNIAPS**	**Negative (ns)**
	Change in amortization of intangibles per share	**AMORTIA**	**Negative (ns)**
Control variables	**Risk of the company**	**BETA**	**Negative (sig)**
	Size of the company	**L-MV**	**Positive (sig)**
	High density intangibles	**HDGIA**	**Negative (sig)**

Source: Author

With:
ns: not significant
sig: significant

4.3 Discussion of Results

4.3.1 Association between intangible assets and the stock market price

Contrary to the conclusions of the bivariate analysis which suggested a positive and significant link between intangible asset variables and stock prices, the results obtained from the M-P econometric model do not confirm this positive correlation. Indeed, multivariate analysis reveals a negative and significant association between active intangible investments and stock prices. This trend is similar to that observed in most studies conducted on the French financial market (Cazavan and Jeanjean, 2006; Boulerne and Sahut, 2010). This work in the French context concluded that investors seem to pay more attention to goodwill, which they perceive as a continuous source of income. As a result, goodwill contributes positively and substantially to the value of equities, unlike specific intangible assets. However, in the French financial market, investors do not consider specific activated intangible assets as reliable predictors of company value and performance. Similarly, the results obtained on the West African financial market suggest that individualized intangible assets on the balance sheet would not provide relevant information to accurately predict security prices. The quasi-parallel similarities in the results between the two contexts (West African and French) could be attributed to the optional accounting treatments offered by the General Chart of Accounts and Syscohada in terms of accounting for intangible assets, in contrast to US and international standards (IAS/IFRS) that prohibit them. IAS/IFRS aims to reduce the risks of accounting manipulation, increase the comparability of accounting data between companies and mitigate the information asymmetry between executives and investors, which could reduce the problem of under-reporting valuation of companies strongly focused on intangible assets and strengthen the correlation between accounting and stock market data. Moreover, the lack of statistical significance of the positive link between the economic depreciation of intangible assets and stock prices indicates that information related to the use of intangible assets has no value for investors on the financial market regional. More precisely, in this context, activated intangible investments have a negative influence on the value of shares. Therefore, these intangible assets are perceived by investors as lacking economic benefits. In fact, these intangible investments are often based on notions of confidentiality and secrecy (Thibierge, 1997, 2001; Ding and Stolowy, 2003; Alcouffe and Louzzani, 2003). Thus, due to the information asymmetry between the managers of the companies in our sample and investors, the former decide to activate their intangible spending to inform the latter of their investment strategies and to anticipate their future performance. However, this form of signaling is perceived negatively by the West African financial market, in contradiction with the predictions of the signal theory.

4.3.2 Association between intangible assets and stock market return

Consistent with the conclusions of the bivariate analysis, the multivariate analysis did not reveal a significant relationship between individualized active intangible assets and stock market returns. This suggests that in the West African context, investors do not perceive specific intangible assets as sources of value, in line with similar studies conducted by Ding & Stolowy (2003), Cazavan & Jeanjean (2006), Casta et al (2007), and

Boulerne & Sahut (2010) in France. For example, a comparative study between French accounting standards and IFRS by Boulerne & Sahut (2010) revealed that the individualized intangible assets recorded on the balance sheet of listed companies have no informative value to explain the returns of securities. Ding and Stolowy (2003) also found that the capitalization of intangible assets, particularly R&D costs, is not relevant to the valuation of the company's market value. In the WAEMU financial market, investors also do not consider capitalised intangible assets as generating value or income, contrary to studies conducted in the United States (Hirschey 1982; Lev and Sougiannis 1996; Lev & Zarowin 1998; Aboody and Lev 1998). The capitalization of intangible assets does not meet the concerns of managing income, but rather aims to communicate information to the financial market. Authors such as Porter (1992), Hall (1993) and Casta et al. (2007) have argued that investors in financial markets often focus on short-term return horizons, which prevents them from perceiving and integrating the potential long-term benefits associated with intangible investments. Moreover, when we differentiate companies based on their intangible asset density, we observe a negative correlation between this criterion and stock market returns. More specifically, the negative contribution of intangible assets to the value of shares encourages investors in the West African context to penalize the securities of companies rich in intangible assets, unlike the results obtained by Boulerne and Sahut (2010) in France. This is in line with the conclusions of Chan et al. (1990), which also observed an undervaluation of companies focused on intangible assets, particularly R&D.

In sum, we can attribute our divergent results compared to American studies to a research vision sometimes biased towards the American model, as suggested by Thibierge (1997). Management studies often tend to rely on American research as a reference. This leads to borrow methodologies, theoretical currents and hypotheses formulated in management of the Anglo-Saxon corpus. However, this predominance of the American paradigm can mask the cultural, legal and social specificities of each context, especially in the West African context. By blindly applying theories developed in the United States and validated for this context, we risk ignoring the particularities of each environment, which can lead to contradictory results from one context to another. In addition, differences in the dissemination of information between developed and African countries as well as differences in market systems can also influence investor reactions. Investors may be quick to react, but they may also be "myopic" in sanctioning investment strategies that have longer-term effects. On the other hand, in developed financial markets, investors can adopt a longer-term outlook, thus avoiding abrupt reactions in the short term.

V. Conclusion

Inspired by the work of Cazavan and Jeanjean (2004, 2006), Casta et al (2007) and Boulerne and Sahut (2010), this study contributes to the debate on the relevance of accounting information for intangible investments. Based on a panel of companies listed on the WAEMU financial market, we try to analyze the informational content of intangible assets in order to understand the perception of this information by the West African financial market. At the end of our analysis, the empirical tests revealed several lessons on the West African financial market. First, it appears, from the econometric regression on the stock price, a negative and significant association between intangible assets and the stock price in the same line as most studies carried out on the French financial market (Cazavan and Jeanjean, 2006; Boulerne and Sahut, 2010). In line with this work, in view of the results obtained on the West African financial market, the individualized intangible assets the assets of the balance sheet would not be relevant information to obtain a better forecast of the price of the securities. As a result, the capitalization of intangible assets acts as a negative signal to investors in the regional financial market contrary to the predictions of signal theory. Second, the insignificance of the positive link between the economic depreciation of intangibles and the stock price indicates that the informative value related to the rate of use of intangibles is non-existent and of little use for investors in the financial market regional. This finding supports the validation of a restrictive interpretation of the Financial Asset Valuation Model (CAPM) and the assumption of efficient financial markets in its semi-form The European Investment Bank is a major player in this field, which may call into question the usefulness of accounting data for investors.

Third, when we discriminate against companies based on their density of intangible assets, we find that this criterion negatively explains stock market performance. This explains why intangible assets do not provide future economic benefits. As a result, the negative contribution of intangible to the shareholder value of companies encourages investors in the West African context to penalize the securities of intangible intensive companies, unlike the studies of Boulerne and Sahut (2010) on the French financial market. Moreover, no significant relationship was detected between intangible and stock market return. This suggests that in the WAEMU regional financial market, investors do not perceive capitalized intangible as a source of value or annuity generators unlike US studies (Hirschey 1982; Lev and Sougiannis 1996; Lev & Zarowin 1998; Aboody and Lev 1998). As a result, investors in the WAEMU financial market are blinded by their short-term return

horizon and therefore have difficulty perceiving and integrating into their investment choice process, the future additional returns inherent in long-term investments. This motivates them to sanction securities of companies intensive in immaterial. Therefore, the high density of intangible is a signal that is negatively perceived by investors in the West African financial market. While our results are instructive, we wish to relativize our conclusions by reporting some criticisms and limitations to our study.

- Our sample is not only small (24 companies observed over 10 years, or 240 observations) unlike the studies of Thibierge (1997) but does not include companies in the biotechnology (Alcouffe et al, 2003) or pharmaceutical sectors (Gu and Lev, 2001), information technologies (Matoussi and Zemzem, 2010) recognized in the empirical literature as sectors intensive in immaterial.
- Using the item 'intangible assets' to approach the intangible, we have retained an aggregate measure instead of individual measures that could make it possible to understand the effect of each intangible on the market variables studied. However, Cazavan-Jeny (2003) points out that integrating intangible expenses of a different nature may mean nothing. This is likely to introduce biases in the results. Moreover, instead of keeping the item 'intangible assets' in level we have chosen to assign a common denominator not only to this investment variable.
- Using fixed-effect models, we have, of course, measured the impact of intangibles on the market variables studied, but have not grasped the extent of the effects of intangibles on stock market indicators.

Due to the limitations mentioned above, future lines of research could make remarkable contributions on the issue of intangible. Specifically, it will be necessary to take into account all information relating to intangible capital in order to examine its valuation by investors on the financial market. Moreover, this research contributes to the debate on the relevance of information inherent to intangible for investors on financial markets.

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