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THE RELATIONSHIP BETWEEN INTELLECTUAL CAPITAL, FIRM VALUE AND FINANCIAL PERFORMANCE IN THE BANKING SECTOR: EMPIRICAL EVIDENCE FROM MOROCCO

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ABSTRACT: The great divide between firm book value and market value has drawn scholar's attention to better understand the reasons behind this difference. Starting from this point, our aim through this paper is to examine the relationship between, in the one hand, Intellectual capital (IC) and firm value and in the other hand IC and firm performance. IC is proxied by The Value Added Intellectual Coefficient method (VAIC), whereas, financial performance is measured by (Return on assets (ROA), return on equity (ROE) and return on investment (ROI)). Firm value is assessed by market and book value. This study is conducted by using data from banking listed companies in Moroccan stock exchange, from 2009 to 2014. These banks represent the overwhelming majority of the Moroccan banking system
Second, by using the VAIC method, we will be able to measure the relation between IC components, as well as, the effect of each one of them on firm value and financial performance.

KEYWORDS: Intellectual capital, Value Added Intellectual Coefficient, bank, Morocco, firm value.

1 INTRODUCTION

In the industrial era the companies depended largely on their tangible assets to create value: land, equipment, etc. Whereas now, in the knowledge economy characterized by the development of communication technology, and the Internet, organizational value drivers shifted from tangible assets to intangibles (Abhayawansa and Abeysekera, 2008) .

In the literature there has been considerable research concerning the change of assets nature from tangible to intangibles. As stated by Sullivan (2000), in 1978 approximately 80 percent of corporate value was due to tangible assets, with 20 percent accounted for intangibles. By 1998, the proportions were reversed, with 80 percent of corporate value associated with intangible assets and only 20 percent with tangibles. Indeed, several studies support the validity of this research. For instance Lev (2001) has shown that, over the period of 1977-2001, the market-to-book value ratios of US Standard and Poors (S&P) 500 corporations increased from slightly above 1 to over 5, implying that about 80 per cent of corporate market value has not been reflected in financial reporting (Chen, et al 2005)

The great divide between the book value and market value has drawn scholar's attention to better understand the reasons behind this difference. Starting from this point, Annell (1989) introduced the concept of invisible balance sheet. Whereas, Sveiby (1997) presented the intangible assets monitors. (Edvinsson and Malone 1997) have noted that IC is the difference between market value and book value. After, this difference is used as proxy of IC and it was not considered as equal to it. The twenty-first century organizations are aware that most of their capacity to create value is strongly linked to the ownership and development of organization's IC (Schiuma et al., 2008). The latter has been recognized as an important resource that organizations need to develop to gain sustained competitive advantages (Chen, 2008; Schiuma & Lerro, 2008). Human capital which is the main component of IC can be regarded as a valuable resource and as a key factor for sustainable competitive advantages (Huselid, 1995; Pfeffer, 1994; Prahalad and Hamel, 1990;Wright et al., 1994, 2001)

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Generally, in strategy literature, the discussion of what make some firms more performing than other has moved from external positioning in the industrial economy (e.g. Porter, 1998) to the availability of organizational resources as the main drivers of competitive advantages (Barney, 1991; Wright et al., 1994, 2001) in the era of Knowledge economy. In other words, If such resources are rare, hard to imitate, nonsubstitutable, and reside within the organization, they can boost the competitive advantage of those firms possessing it (Barney, 1991; Coff, 1997), and Competitive advantage helps firms yield positive returns (Peteraf, 1993) , this theory is called the resource based view (RBV).

The aim of this paper is first to investigate, on the one hand, the relation between IC proxied by the VAIC^{TM} (Pulic, 2000) and firm value (book and market value), on the other hand the relation between IC and profitability (Return on assets (ROA) and return on equity (ROE) and return on investment (ROI)) by using data from banking listed companies in Moroccan stock exchange, from 2009 to 2014.

Second, by using the VAIC method, we will be able to measure the relation between IC components, as well as, the effect of each one of them on firm value and profitability

The remainder of this article organized as follows: We'll start by discussing different IC component as well as measurement method. VAIC which will be used will be largely detailed, and a large literature review concerning IC and firm value will be presented

We conclude with the study conducted in banking sector concerning listed companies. We explain sample choice and survey method. Results are presented and discussed

2 INTELLECTUAL CAPITAL

2.1 CONCEPTS

IC plays has an important role in today's organizations. It's defined differently. Some scholars defined it as the difference between a company's market value and accounting value (Edvinsson and Malone, 1997; Stewart, 1997; Sveiby, 1997; Mouritsen et al., 2001), while others define it as the knowledge that can be converted into profit (Harrison and Sullivan, 2000).

Different classifications are given to IC, but the most known and generally accepted divides into three components which are:

HUMAN CAPITAL

Human capital is rooted in a certain way in the talent of employees (Cater & Cater, 2009).This capital can't be owned by the firm. for Edvinsson and Malone (1997) Human capital is a combination of knowledge, skills, experience and the individual capabilities of the firm's employees, which it is not possible to appropriate

STRUCTURAL CAPITAL

Structural capital is independent of individuals and is generally explicit (Chen, Lin, & Chang, 2006);. According to Edvinsson and Malone (1997) it's the infrastructure that incorporates, forms and supports human capital, encouraging the human factor to create and to share knowledge

RELATIONAL CAPITAL

Relational capital is the value of a firm's relationships with people and organizations with which it conducts business (Cabrita & Bontis, 2008)

2.2 INTELLECTUAL CAPITAL MEASURES METHODS

IC valuation methods are manifold. Each model depends in a particular field. According to Andriessen (2004), five communities exist: the intellectual capital community, the human resource accounting community, the performance measurement community, the valuation community, as well as the accounting community.

In adequacy with the objectives of our study, let us be part of the valuation community and the accounting one. The valuation community seeks methods for valuing individual intangible assets using a cost, a market or an income approach

(Sudarsanam et al., 2005) and the accounting community addresses the issue of the decreasing relevance of traditional financial information and finds ways to recognize intangible assets in financial statements (Lev, 2001)

An other classification is given by Andriessen (2004) in consonance with the method purpose. He distinguishes between the internal management approach and the external reporting approach,

Sveiby (2001) proposed a two-dimensional matrix that represents IC valuation models conforming to their valuation level (organizational or component level) and their means of the method (Non-monetary and monetary).

3 THE VALUE ADDED INTELLECTUAL COEFFICIENT VAIC

The VAIC model is intended to measure the extent to which a company produces added value based on intellectual (capital) efficiency or intellectual resources. This concept is credited to Dr. Ante Pulic (1995) whose interest was the processes of value creation in the new economy and the role of Intellectual capital. Three years later Pulic (1998, 2000) presented the concept and the application of "Value Added Intellectual Coefficient" (VAIC) to measure the IC of companies the concept in business practice were officially presented in the year 1999.

The first application concerned of top 400 Croatian companies and its results were presented at round table organized by leading Croatian economic magazine.

The purpose of this method is to provide information about the value creation efficiency of tangible and intangible assets within a company. VAIC™ method has been applied both: macro level and micro level and the results of the application of the models have been presented at different scientific meeting around the world.

According to Tan, Plowman, Hancock, (2007) The Pulic model is concerned with two other important aspects of valuation and value creation yet unsolved by other methods:

(1) Market-based IC value cannot be calculated for companies that are not listed on the stock market. Such companies need an alternative way to determine their market-based IC value.

(2) There is no adequate system of monitoring the efficiency of current business activities performed by employees, or whether their potential is directed towards value creation or value destruction.

The first element to take into consideration is the company's ability to create value added (VA). VA is the difference between sales (OUT) and inputs (IN):

VA = OUT - IN

(OUT): Outputs, they represent all the revenue including all the products and services sold on the market.

(IN): Inputs include all the expenses incurred in earning the revenue except labor expenses which is considered as an asset and not a cost.

The second relation of VA is capital employed efficiency CEE. This is an indicator for the VA created by one unit of physical capital employed CE. Capital Employed (CE) = physical capital + financial assets=Total assets – intangible assets.

The formula is: CEE = VA/CE

If a unit of CE generates greater returns in one company than another, then the first company is better at utilization of its CE. Thus, better utilization of CA is part of the IC of companies.(Pulic, 1995)

The third relation concerns VA and HC. The 'human capital efficiency' (HCE) shows how much VA is created by a dollar spent on employees. The problem that arises is how to calculate th HC. Salary and wage costs are an indicator of a firm's HC (Edvinsson, 1997; Sveiby, 1998), Pulic (1998)

The formula is: HCE= VA/HC:

The fourth relation is "structural capital effeciency (SCE). The purpose is to assess the contribution of structural capital (SC) in value creation. In Pulic's model, SC is VA minus HC.

SC=VA-HC

The relation between VA and SC is calculated as: SCE = SC/VA

Finally, we calculate the intellectual ability of a company. It is the sum of the previously mentioned coefficients.

VAIC = CCE + HCE + SCE

The major advantage of Pulic's method is the availability of data in financial reports of companies.

4 IC FIRM VALUE AND FIRM PERFORMANCE

Several studies have demonstrated the strong relationships between intellectual capital and firm performance as well as firm value. Table I summarizes the relevant studies in this field:

Table 1: IC/ Firm performance most relevant studies

Authors	Context	Main Findings
Aboody and Lev (2000)	the chemical industry	Strong relation between IC and the current and future operating earnings
Cabrita and Vaz (2005)	53 Portuguese banks	A significant correlation of IC and the organizational performance and that the interaction between the components of the IC generates greater value.
Kamath (2008)		no relation between IC and firm profitability
Puntillo (2009)	banks listed on the Italian stock market	Weak relationship among IC, ROI, and return on asset (ROA).
Muhammad and Ismail (2009)	18 Malaysian financial companies	significant relationship between the VAIC and ROA
Clarke et al. (2010)	Australian listed companies	direct relationship between IC and the performance (ROA and ROE)
Ferraro and Veltri (2011)	Italian listed companies	Weak relationship between IC and market value
Gigante and Previati (2011)	Italian banks	Positive but not statistically significant relationship between equity returns, the VAIC and its components.
Maditinos et al. (2011)	96 Greek listed companies	Weak relationship among IC, M/BV but identifies a statistically significant relationship between the efficiency of human capital and ROE
Rehman et al. (2011)	12 Pakistani companies	positive and statistically significant relationship between the components of the VAIC and the ROE
Celenza and Rossi (2012),	11 Italian listed companies	Weak relationship VAIC and the profitability indicators (ROI and ROE)
Janosevic et al. (2013)	100 Serbian companies	Positive and statistically significant relationship between the ROE and the efficiency of CE and between the ROE and the efficiency of human capital.

5 DATA AND SURVEY METHODOLOGY

5.1 SAMPLE

The sample examined in this study is composed of six banks listed Moroccan stock exchange for the period 2009-2014. The analysis of bank concentration on the basis of market share of the main banks, Banque Populaire and Attijariwafa bank, that hold a market share cumulated of more than 50%, followed by the BMCE. The first four banks cover 74% from the deposits, 72% of the credit and 70% of the banking net profit[1]

In spite of the fact that the number of examined banks is low, their market share is very important (85% in 2014) (table1)

1 « Conseil de la concurrence réalisation d'une étude sur la concurrentiabilité du secteur bancaire Rapport de synthèse des volets I et II Mars 2013 »

Table 2: Banks Market share in 2014

Bank	Market share
AWB	27 %
BMCE	14,60%
BCP	26,70%
BMCI	7,60%
CDM	5,70%
CIH	3%
Total	85%

Source From annual reports 2014

5.2 PERFORMANCE MEASURES

Companies' financial performance examination can be made either by the absolute performance in terms of the scale of operation (balance sheet and income statement items) or the relative performance in terms of financial ratios. Ratios allow us to scale for factors, such as size, that vary within an industry and across industries. These financial performance measures can be used to compare performances over time, across industries, against benchmarks, or within segments of a particular business. (Katchova, Enlow ;2013)

Literature suggests that a set of performance measures should be diverse in order to provide various kinds of information regarding the different dimensions of firm performance (Tangen, 2005)

Firm performance is usually measured as financial and nonfinancial performance measures. Financial performance comprises of financial efficiency measures such as return on investment and return on equity, and profit measures such as return on sales and net profit margin (Li, Huang, and Tsai, 2010).

Tan, Plowman, Hancock, (2007) in their study investigating the association between the intellectual capital (IC) of firms and their financial performance, used three performance indicators: Return on equity (ROE); Earning per share (EPS) and annual share returns (ASR).

Shawqi Naji Jawad, Bontis (2010) in a study conducted in Jordanian pharmaceutical sector, used three indicators to represent firm performance: Sales growth, profit growth and market value

Sydler Haefliger Pruksa (2014) defined the profitability of the firm its return on asset. Arguing that this measure has the advantage of being independent of the firm's financial leverage.

5.3 FINANCIAL INDICATORS

For this study, three performance indicators are chosen according to two criteria. First, we will choose the most used indicators in literature. Second, according the data availability, we'll use the most suitable indicator. For these reasons, ROE, ROI and ROA are designated to represent firm performance in our study.

Firm value

To asses firm value we'll take two variables, book value and firm value.

5.4 VARIABLES MEASUREMENT

The variables used in this study are summarized as follows:

5.4.1 FINANCIAL VARIABLES

Table 3: Financial variables

Variable	Definition	Formula
MV : Market value	The highest estimated price that a buyer would pay and a seller would accept for an item in an open and competitive market. business dictionary.com	Share closing price at the end of a year x the number of listed shares
BV : Book value	Book value of equity at the end of the year	total assets - intangible assets - liabilities
ROE: Return on equity	A measure of profitability that calculates how many dollars of profit a company generates with each dollar of shareholders' equity	ROE= net income/ stockholders' equity- net income)
ROI: Return on investment	A performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments	ROI= operative income/total assets
ROA: Return on asset	An indicator of how profitable a company is relative to its total assets.	ROA = Net income / Total asset

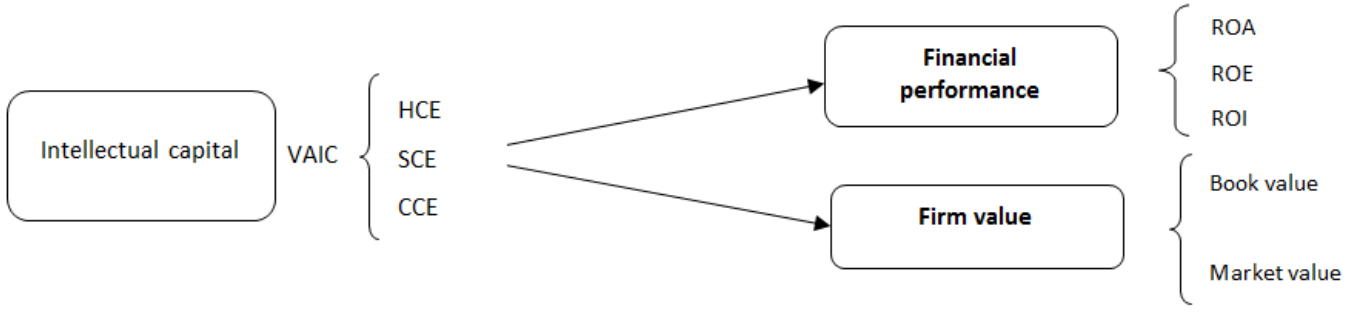
5.4.2 VAIC VARIABLES

VAIC variables are presented in the table below

Table 4: VAIC variables

Variable	Formula
Value added (VA)	VA OUT - IN
Capital Employed (CE)	CE=Total assets – intangible assets.
structural capital (SC)	SC = VA-HC
capital employed efficiency (CEE)	CEE= VA/CE
human capital efficiency' (HCE)	HCE = VA/HC
structural capital effeciency (SCE).	SCE = SC/VA
Intellectual capital efficiency (ICE)	ICE = HCE + SCE
Value Added Intellectual Coefficient (VAIC)	VAIC= CCE + HCE + SCE

5.5 MODEL



5.6 HYPOTHESIS

The following hypotheses are formulated:

H1. A positive relationship exists between the intellectual capital value and the market value

H2. A positive relationship exists between the elements of the of intellectual capital value (HCE, CEE and SCE) and the market value

H3. A positive relationship exists between the intellectual capital value and the book value

H4. A positive relationship exists between the intellectual capital value and the market to book value

H5. A positive relationship exists between the intellectual capital value and the ROE

H6. A positive relationship exists between the elements of the intellectual capital value (HCE, CEE and SCE) and the ROE.

H7. A positive relationship exists between the intellectual capital value and the ROI

H8. A positive relationship exists between the intellectual capital value and the ROA

6 ANALYSIS

The ranking of Moroccan banks according to VAIC method shows that AWB occupies the first class with the highest VAIC (5,513051) followed by BCP (3,882177), BMCI (3,849145), CDM(3,217097), CIH(3,116564) and finally BMCE (2,968741)

This study reveals that value creation capability of banks is mainly determined by HCE (Figure 1)

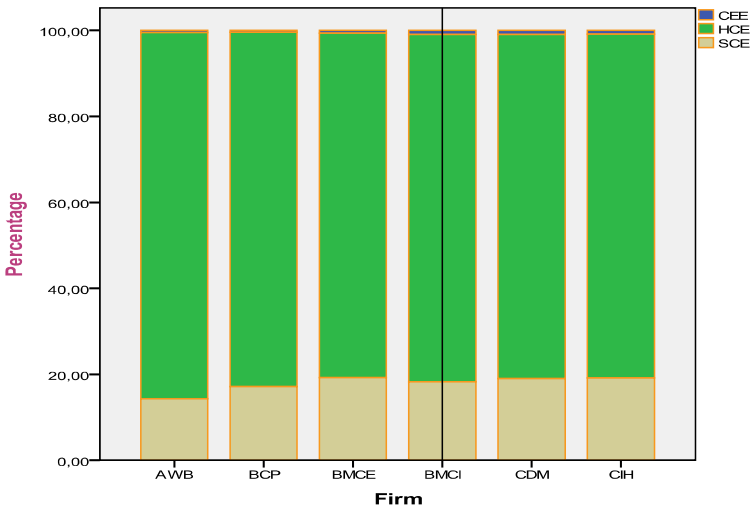


Figure 1: Moroccan bank Intellectual capital composition

Table 5 gives more details on the composition of IC in Moroccan banks.

Table 5: Detailed Moroccan bank Intellectual capital composition

	CCE	HCE	SCE	VAIC
AWB	0,0281	4,6986	0,7864	5,5131
BCP	0,0162	3,2131	0,6529	3,8822
BMCE	0,0195	2,3785	0,5707	2,9687
BMCI	0,0362	3,1236	0,6893	3,8491
CDM	0,031	2,5755	0,6106	3,2171
CIH	0,0269	2,4927	0,597	3,1166

Table 6 gives descriptive statistics

Table 6: Descriptive statistics

	Mean	Maximum	Minimum	Median	Std deviation
VA	2 932 486,83	9 226 146,00	500 357,00	2 345 762,00	2 221 896,93
CCE	0,0263	0,0387	0,0078	0,0281	0,0075
HCE	3,0971	5,2027	1,6004	2,7499	0,9378
SCE	0,6527	0,8078	0,3752	0,6395	0,0961
VAIC	3,7761	6,0427	1,9834	3,4187	1,0300
Market value	27 003 736,11	78 549 355,72	2 322 320,00	28 646 225,50	22 942 866,99
Book value	15 459 962,60	44 617 416,00	3 100 344,00	12 698 591,00	11 444 539,28
ROI	3,56%	6,47%	1,64%	3,62%	0,92%
ROE	12,72%	49,10%	4,82%	11,92%	7,84%
ROA	0,96%	1,40%	0,37%	1,09%	0,34%

Table 7 gives the data multivariate analysis.

Table 7: Data analysis: multivariate analysis

		VA	CCE	HCE	SCE	VAIC	ROI	Market value	ROE	ROA	MBV
VA	R	1,000	0,050	**0,838**	**0,710**	**0,829**	-0,047	**0,894**	0,067	0,259	**0,514**
	Sig.		0,774	0,000	0,000	0,000	0,787	0,000	0,702	0,134	0,003
CCE	R	0,050	1,000	0,215	0,395	0,240	**0,933**	-0,352	0,053	0,302	**-0,611**
	Sig.	0,774		0,214	0,019	0,164	0,000	0,048	0,764	0,078	0,000
HCE	R	**0,838**	0,215	1,000	**0,935**	**0,999**	0,011	**0,684**	0,175	**0,539**	0,226
	Sig.	0,000	0,214		0,000	0,000	0,951	0,000	0,314	0,001	0,214
SCE	R	**0,710**	**0,395**	**0,935**	1,000	**0,947**	0,220	0,491	0,132	0,516	0,008
	Sig.	0,000	0,019	0,000		0,000	0,205	0,004	0,449	0,002	0,966
VAIC	R	**0,829**	0,240	**0,999**	**0,947**	1,000	0,037	**0,666**	0,172	**0,541**	0,202
	Sig.	0,000	0,164	0,000	0,000		0,832	0,000	0,323	0,001	0,268
ROI	R	-0,047	**0,933**	0,011	0,220	0,037	1,000	-0,425	-0,007	0,175	**-0,602**
	Sig.	0,787	0,000	0,951	0,205	0,832		0,015	0,969	0,315	0,000
Market value	R	**0,894**	-0,352	**0,684**	0,491	**0,666**	-0,425	1,000	0,335	0,160	**0,787**
	Sig.	0,000	0,048	0,000	0,004	0,000	0,015		0,061	0,383	0,000
ROE	R	0,067	0,053	0,175	0,132	0,172	-0,007	0,335	1,000	0,443	0,277
	Sig.	0,702	0,764	0,314	0,449	0,323	0,969	0,061		0,008	0,126
ROA	R	0,259	0,302	**0,539**	**0,516**	**0,541**	0,175	0,160	0,443	1,000	-0,146
	Sig.	0,134	0,078	0,001	0,002	0,001	0,315	0,383	0,008		0,426
MBV	R	**0,514**	**-0,611**	0,226	0,008	0,202	**-0,602**	**0,787**	0,277	-0,146	1,000
	Sig.	0,003	0,000	0,214	0,966	0,268	0,000	0,000	0,126	0,426	

Table 8 gives univariate analysis

Table 8: Data analysis: univariate analysis

Dependant variable	Independant variable	Signification	R	R2	Fisher Test			Student test		
					Test	df	Table	Test	df	Table
Market value	VAIC	0,000	0,666	0,444	**23,97**	1 et 30	**4,17**	**4,89**	31	**2,0423**
MBV	VAIC	0,268	0,202	0,041	1,274	2 et 30	4,17	1,121	31	2,0423
BOOK VALUE	VAIC	0,000	0,722	0,521	**35,96**	0 et 33	**4,12**	**5,997**	31	**2,0423**
ROE	VAIC	0,000	0,172	0,03	1,008	1 et 33	4,12	1,004	31	2,0423
ROI	VAIC	0,832	0,037	0,001	0,046	1et 33	4,12	0,214	31	2,0423
ROA	VAIC	0,01	0,541	0,293	**13,68**	1 et 33	**4,12**	**3,7**	31	**2,0423**

In our survey, we test the relationship between variables through the simple and multiple linear regression analysis models using SPSS software. We conduct two type of analysis. The first one concerns the relationship of VAIC with market value, book value, ROE, ROI and ROA. In the second, we examine the components of VAIC with the market value and ROE.

Opposite to what one can expect, results show that there is no correlation between IC value and financial performance, except a moderate uphill relationship between VAIC and ROA (R2= 0,293). Instead, a positive and statistically significant correlation exists between VAIC and market value. Also book value seems to be strongly with VAIC. Whereas, Market to book ratio is not correlated with intellectual capital

In the second part and in accordance with the first analysis, there is no relation with the component of IC and financial performance (ROE). Results show also that among the components of IC, only HC is correlated to firm value.

In the light of these result we conclude that:

H1 is verified
H2 is verified
H3 is verified
H4 isn't verified
H5 isn't verified
H6 isn't verified
H7 isn't verified
H8 is verified

7 CONCLUSION

The main objective of this study is to examine the relationship between, in the one hand, IC and firm performance and in the other hand IC and firm value. IC is proxied by VAIC method, whereas, financial performance is measured by ROE, ROA and ROI. Firm value is approached by two elements, market value and book value. The analysis is carried on data of Moroccan listed banks which represent the overwhelming majority of the Moroccan banking system. Results, which are based on simple and multiple regression analysis made by SPSS software, show that HC is the most important component of IC. Empirical findings Indicate that IC is far from being determinant of the banks financial performance in Moroccan context.

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