The Impact of Economic Value Added (EVA) on the Market Price of Shares of Companies Listed on the Algerian Stock Exchange Compared to Traditional Indicators (ROE and ROA) during the Period (2018-2023)

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***Abstract*:**

This research paper aims to examine the impact of Economic Value Added (EVA) on the market price of shares of companies listed on the Algerian Stock Exchange, compared to traditional indicators such as Return on Equity (ROE) and Return on Assets (ROA), during the period (2018–2023).

To achieve the objectives of the study, the values of each indicator of the financial performance evaluation measures were calculated separately as a first step. In the second step, the SPSS software was used to analyze the data and test the hypotheses. The study concluded with several findings, the most important of which is that the economic value added (EVA) provides the most explanatory power for changes in the shares prices of companies listed on the Algerian Stock Exchange, compared to ROE and ROA.

Keywords: *Economic Value Added (EVA), Return on Equity (ROE), Return on Assets (ROA), Economic Companies, Algerian Stock Exchange.*
Jel Classification Codes : *G30, G32, G31, M41, L10, G15.*

***Résumé*:**

Cette étude vise à examiner l'impact de la valeur ajoutée économique (EVA) sur le cours des actions des sociétés cotées à la Bourse algérienne, par rapport aux indicateurs traditionnels tels que le rendement des capitaux propres (ROE) et le rendement des actifs (ROA), au cours de la période (2018-2023).

Pour atteindre les objectifs de l'étude, les valeurs de chaque indicateur de performance financière ont été calculées séparément dans un premier temps. Dans un deuxième temps, le logiciel SPSS a été utilisé pour analyser les données et tester les hypothèses. L'étude a abouti à plusieurs conclusions, dont la plus importante est que la valeur ajoutée économique (EVA) offre le meilleur pouvoir explicatif des variations du cours des actions des sociétés cotées à la Bourse algérienne, par rapport au ROE et au ROA.

Mots clés: *Valeur Ajoutée Economique (EVA), Rendement des Capitaux Propres (ROE), Rendement des Actifs (ROA), Sociétés économiques, Bourse algérienne.*
Jel Classification Codes : *G30, G32, G31, M41, L10, G15.*

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I. Introduction

Financial performance evaluation is considered a means of measuring results achieved in light of pre-determined standards. Institutions often rely on the balance sheet and income statement for this evaluation, using financial analysis tools particularly financial ratios as the basic method to assess profitability, operational efficiency and liquidity.

According to (Brindusa Tudose, Diana Rusu, & Avasilcai, 2022, p. 122) "Research on financial indicators has identified four generations of performance evaluation metrics: Profit margin and Earnings growth rate, Return on assets (ROA), return on equity (ROE), and return on investment (ROI)".

Several criticisms have been directed at financial measures by other specialized scholars, such as Gomes et al. (2004), Kennerley and Neely (2003), Said Hassab Elnaby and Wier (2003), Medori and Steeple (2000), and Cumby and Conrod (2001). Among the main criticisms are the following: it focus on short-term performance evaluation, they lack a strategic dimension in performance evaluation. They focus solely on outcomes rather than the underlying causes, they do not assist managers in identifying the drivers of success within their companies, they are tools for diagnosing problems that may confront the institution, and do not provide an accurate picture of the extent of management's contribution to what is called "creating value for shareholders" and maximizing their wealth, the latter of which was a product of the secretions of the new financial environment, it has become the new strategic path for most companies. (Tayah Al-Naimi & Fouad Al-Tamimi, 2008, pp. 141-142) (Salih Al-Hanawi & Farid Mustafa, 2005, p. 64)

By adopting the economic measurement of corporate performance, financial management has worked to develop value measures. In the 1990s, a number of value-based measurement methods emerged, the most important of which are the cash flow return on investment (CFROI) and the total return on equity (TSR), Market Value Added (MVA), Residual Cash Flow (RCF), or Cash Value Added (CVA), and other methods, most notably the Economic Value Added (EVA), which is the subject of our study. (Bahri, 2014, p. 91)

According to (Hammer & Siegfried, 2022, p. 44) "The term EVA is a registered trademark of the US management consultancy Stern Stewart & Co. and is based on the work "The Quest for Value" published by Stewart in 1991". (EVA) has become an important measure for evaluating corporate performance, shifting assessment from conventional accounting metrics to a deeper comprehension of value generation. This indicator measures how effectively a company utilizes its resources. Fundamentally, the concept of (EVA) aligns with residual income, suggesting that any effective management strategy

should actively generate returns that surpass the anticipated cost of capital, thus contributing to wealth generation for stakeholders (Castillo, 2000, pp. 59-60)

I.1 Research Problem

In light of the above, the research problem can be formulated in the following main question: **Does the economic value added (EVA) have a greater impact on the market price of shares of companies listed on the Algerian Stock Exchange than the traditional indicators ROE and ROA?**

I.2 Research Hypotheses

To answer the problem posed, we will attempt to limit our research to a main hypothesis: **Economic Value Added (EVA) has a greater impact on the market price of shares of companies listed on the Algerian Stock Exchange than traditional indicators ROE and ROA**.

Under this hypothesis are other sub-hypotheses, which are:

- There is a statistically significant effect between the return on equity (ROE) and the average market price of the study sample companies' shares (P) at the $\alpha = 0.05$ error level;
- There is a statistically significant effect between the return on Assets (ROA) and the average market price of the study sample companies' shares (P) at the $\alpha = 0.05$ error level;
- There is a statistically significant effect between the Economic value added (EVA) and the average market price of the study sample companies' shares (P) at the $\alpha = 0.05$ error level.

I.3 Research Objectives

The study, both theoretical and applied, aims to:

- Provide a brief overview of economic value added (EVA) and demonstrate its importance in assessing the sound financial performance of companies;
- Determining the rate of return on equity (ROE) for economic companies listed on the Algerian Stock Exchange, the subject of the applied study during the period (2018-2023);
- Determining the rate of return on assets (ROA) for economic companies listed on the Algerian Stock Exchange, the subject of the applied study during the period (2018-2023);
- Calculating the economic value added (EVA) of economic companies listed on the Algerian Stock Exchange is the subject of the applied study during the period (2018-2023);
- Studying the impact of each of the previous indicators(ROE), (ROA) and (EVA) on the average market price of shares of companies listed on the Algerian Stock Exchange (P) during the period (2018-2023), and determine the most influential indicator on the latter.

II. Theoretical Framework

II.1 Historical Background of Economic Value Added (EVA)

According to (Denglos, Value Creation: Models, Measurement, Diagnosis, 2003, p. 62) "The concept of Economic Value Added (EVA) is not new, it was discussed by Alfred Marshall in 1890", The development of (EVA) is mainly due to the historical studies of classical economists who dealt with the concept of residual income (RI), which is based on the fact that in order to achieve value for shareholders, the Company must use its available resources in a way that results in achieving a return on the invested capitals that is greater than the cost of obtaining these funds, whether they are equity or debt. (Grant, 2003, p. 3)

In the 1990s, the management thinker Peter Drucker emphasized this principle, stating that without profits exceeding capital costs, businesses operate at a loss. These principles set the stage for EVA's emergence in the corporate realm during the early 1990s, when Stewart & Stern Company refined the residual income (RI) measure (Elali, 2007, p. 21). According to (L'ordon, 2000, p. 132) "It popularized the concept of economic profit and registered the method of calculating it as a trademark under the name (EVA)". In the 20th century, the concept of EVA was the object of extensive academic debate in the accounting and finance literature. (Elali, 2007, pp. 21-22). As the financial landscape evolved, especially following the stock market crises (2007-2009), the application of (EVA) garnered increased attention (Pataky, 2012, p. 1). Where traditional performance measurement were criticized for their inability to adequately account for various costs, this new emphasis on (EVA) underscored the necessity for company to achieve returns exceeding capital costs, the growing adoption of (EVA) showcases its integral role in shaping corporate accountability for shareholder value, reinforcing its status as a vital metric for assessing corporate health and decision- making efficacy.

II.2 Definition of EVA

According to (Strekalina A., Zakirova R., Shinkarenko A, & Vatsaniuk, 2023, p. 98) "(EVA) reflecting the growth or decrease in the company's value over a specific period. It can be used for either forward or backward looking", (EVA) is a measure of surplus value created on an investment (Damodaran, 2002, p. 1225). According to (L'ordon, 2000, p. 122) "Iit defined as the total economic profit, meaning that it is not the traditional net accounting result, but rather the surplus resulting after deducting the total cost of capital, including the cost of equity capital". (EVA) is equal to the difference between the operating profit after tax (NOPAT) and the total cost of the amount of capital invested, according to Stewart Stern, a company's (EVA) can be calculated: (Damodaran, 2002, p. 1225)

EVA = (ROCI – WACC) × IC

EVA = NOPAT – (IC × WACC)

Once the (EVA) is calculated, it is a measure of management's performance and its ability to create additional wealth for shareholders or destroy existing wealth. Therefore, the (EVA) takes a positive value if the net operating profit after tax (NOPAT) is greater than the cost of invested capital, while it takes a negative value if it's the opposite, as follows: (Jaka, Cahyat, & Rukmi, 2023, p. 58)

a) EVA Value > 0 or EVA is Positive: In this position, it means that the company's management has succeeded in creating economic added value for the company;
b) EVA Value = 0: This position means that the company's management is at the breakeven point. The company did not decline but at the same time did not progress;
c) EVA Value < 0 or EVA is Negative: In this position, it means that there is no process of adding economic value to the company, in the sense that the profits generated cannot meet the expectations of creditors and company shareholders.

II.3 Economic Value Added (EVA) components

The importance of this indicator (EVA) requires a detailed study of its components, through the equation for calculating it, its components become clear to us, as follows:

II.3.1 NOPAT: Net Operating Profit after Taxes

It obtained from change operations after tax but before financing costs and non-cash bookkeeping such as depreciation costs. Thus (NOPAT) can also be interpreted as the amount of profit available to provide cash returns to providers of funds for stock capital (Jaka, Cahyat, & Rukmi, 2023, p. 58). It can be calculated as follows (Bogliolo, 2001, p. 87)

NOPAT = EBIT (1 – T)

Where:

EBIT: Earnings before Interest and Taxes;

T: Corporate profits taxes.

II.3.2 IC: Invested Capital

You can think of invested capital, in two ways that are equivalent. The first is the net assets a company needs to generate NOPAT. The second is how the company finances those net assets, typically through a combination of debt and equity. In other words, you can compute invested capital using either the left- or right-hand side of the balance sheet (Mauboussin & Callahan, 2022, p. 5), as follows (Bogliolo, 2001, p. 82):

a) Assets or uses approach*:* The Capitals invested are represented by net fixed assets plus working capital requirements.

Invested Capital = Net fixed assets + Working capital requirements

b) Liabilities or resources approach: Invested Capital, according to this approach, consists of equity capital and financial debts.

Invested Capital = Equity Capital + Financial Debts

II.3.3 ROCI: Return on Invested Capital

ROCI is the ratio of net operating profite after taxes (NOPAT) to invested capital (IC), as follows (Denglos, Value Creation: Models, Measurement, Diagnosis, 2003, p. 62):

ROCI = NOPAT/ IC

II.3.4 WACC: Weighted Average Cost of Capital

WACC is found by determining the proportions of debt and equity financing that a company uses to determine the total cost of capital. The equation is (Hargrave, 2024):

WACC = [E / V]×Re + [D / V]×Rd (1−T)

Where:

E: Market value of the Company's equity;

D: Market value of the Company's debt;

V: E+D;

Re: Cost of equity;

Rd: Cost of debt;

T: Corporate tax rate

Noting that the Cost of equity is calculated using the Capital Asset Pricing Model (CAPM), Below is the formula for the cost of equity (Hargrave, 2024):

Re = Rf + B [Rm - Rf]

Where:

Rf: the risk-free rate (typically the 10-year Treasury bond yield);

Rm: annual return of the stock market;

β**:** equity beta, the risk coefficient, which determines the volatility of a stock's return

relative to that of the market (Denglos, The EVA-MVA Value Creation Model: Presentation, Modifications, and Reformulation, 2005, p. 46), it is calculated by (Rutkowska-Ziarko & Pyke, 2017, p. 57):

$$\beta = \frac{cov\,(Rit,Rm)}{VAR\,(Rm)}$$

where Rit: the return of the company's share

Also, cost of debt is merely the interest rate paid by the company on its debt, the debt is calculated on an after-tax basis as follows (Hayes, 2024):

Cost of debt = Interest expense Total debt × (1−T)

III. Methodology

The study population consists of all the companies listed on the Algerian Stock Exchange, totaling (08) companies. The study sample includes all Companies that were listed on the stock exchange during the study period were included, totaling (05) companies.

Table (01): Definition of the study sample

Company	Code	Year of establishment	Number of shares	Sector
Alliance Insurances	ALL	2005	9 287 217	Insurances
Biopharm	BIO	1992	25 521 875	Pharmaceutical industry
Egh EL Aurassi	AUR	1975	6.000.000	Hotel
Saidal	SAI	1989	10.000.000	Pharmaceutical industry
AOM Invest	AOM	2011	4 596 030	Tourism

Source: Prepared by the researcher based on the reports of the website: https://www.sgbv.dz/?page =ligne_societe&lang=fr, Consulted on: 02-27-2025.

III.1 Data Collection Sources and Methodology

This study relied on secondary data sources. Data were obtained from the annual financial reports of the industrial companies listed on the Algerian Stock Exchange under study. Secondary data were used due to the nature of the variables under study.

III.2 Statistical method

the analysis was conducted using the SPSS software, to estimate the study model, the multiple linear regression method was adopted, which is based on testing the effect of independent variables on the dependent variable by constructing an equation used for prediction or explanation.

It is expressed by the following equation: **P = f (ROE, ROA, EVA)**

This can be written in Ordinary Least Square (OLS) form as follows:

$$\mathbf{Pt = Bo + B_1\ ROEt + B_2\ ROAt + B_3 EVAt + Ut}$$

Where:

P: The annual average market price of the shares of the companies under study;

ROE: Return on Equity;

ROA: Return on Asset;

EVA: Economic Value Added;

t: time period under study;

B_0: constant;

B_1-B_3: parameter or coefficient of explanatory variable;

U: error term.

IV. Results and discussion

IV.1 Study Variables

IV.1.1 The dependent variable

Is represented by the average market price of the shares of the companies in the study sample during the period (2018-2023), as follows:

Table (02): Average market price of shares of companies listed on the Algerian Stock Exchange during the Period (2018-2023) (AD)

	2018	2019	2020	2021	2022	2023
ALL	420	425	399	257	374	414
BIO	1089	1210	1186	1241	1651	2472
AUR	518	539	552	556	495	459
SAI	617	605	550	501	540	513
AOM	300	480.75	490	490	372.46	276.25

Source: Prepared by the researcher based on the Algerian Stock Exchange website https://www.sgbv.dz, Consulted on: 02-27-2025.

IV.1.2The Independent Variables

All the independent variables ((ROE), (ROA) and (EVA)) for the companies in the study sample will be calculated based on their financial statements for the period (2018-2023), as published on the Algerian Stock Exchange website, As follows:

a) ***The First Independent Variable (ROE):*** It is calculated using the following formula: **ROE = (Net Income Equity)**

Table (03): Return on Equity (ROE) during the Period (2018-2023)

	2018	2019	2020	2021	2022	2023
ALL	13.49%	10.96%	9.44%	9.47%	9.85%	7.84%
BIO	22.75%	20.15%	13.7 8%	17.25%	17.12%	15.64%
AUR	8. 86%	0.46%	-16.19%	-14.22%	1.08%	11.96%
SAI	5.93%	3.64%	0.85%	0.21%	-15.75%	9.08%
AOM	1.05%	0.63%	-0, 84%	4.17%	4.59%	5.32%

Source: Prepared by the researcher Based on the financial statements of the study sample companies for the period (2018-2023).

b) ***The Second Independent Variable (ROA):*** It is calculated using the following formula: **ROA = (Net Income / Total Assets)**

Table (04): Return on Assets (ROA) during the Period (2018-2023)

	2018	2019	2020	2021	2022	2023
ALL	5.47%	4. 86%	4.14%	4.14%	4.06%	3.17%
BIO	13.58%	11.40%	7.49%	9. 82%	10.19%	8.96%
AUR	3. 87%	4.86 %	-6.34%	-5.34%	0.39%	4.90%
SAI	2.96%	1.96%	0.47%	0.11%	-6.66%	4.04%
AOM	0, 35%	0.17%	-0, 50%	2.56%	2.82%	3.36%

Source: Prepared by the researcher Based on the financial statements of the study sample companies for the period (2018-2023).

c) ***The Third Independent Variable (EVA):*** It is calculated using the following equation: EVA = NOPAT – (IC × WACC)

- ***Calculate Net Operating Profit After Tax (NOPAT)***

Table (05): Net Operating Profit after Tax (NOPAT) for the Period (2018-2023)

	Statement	2018	2019	2020	2021	2022	2023
ALL	Result of exploitation	322953228	341253956,7	382782697,6	414727452	492658442	362985176
	Financial expenses	4185158	12672359	11184243,02	20217702	33652220	37037191,55
	EBIT	327138386	353926315,7	393966940,6	434945154	526310662	400022367,6
	NOPAT	**264982092,7**	**286680315,7**	**319113221,9**	**352305574,7**	**426311636,2**	**324018117,7**
BIO	Result of exploitation	8835000000	9401000000	7418000000	9823000000	10319952688	10762371472
	Financial expenses	290000000	129000000	921000000	343000000	499380134	453176851
	EBIT	9125000000	9530000000	8339000000	10166000000	10819332822	11215548323
	NOPAT	**7391250000**	**7719300000**	**6754590000**	**8234460000**	**8763659586**	**9084594142**
AUR	Result of exploitation	698788151,6	87886890	-613309616	-501904516	82511150,7	484934021,7
	Financial expenses	169212870	97184043,55	65049293,31	8503899,6	29510620,66	7842637,72
	EBIT	868001021,6	185070933,6	-548260322	-493400617	112021771,4	492776659,4
	NOPAT	**703080827,5**	**149907456,2**	**-444090861**	**-399654500**	**90737634,8**	**399149094,1**
SAI	Result of exploitation	1293874389	995270119	329421602	426918801,9	-2461393298	2156167754
	Financial expenses	254951764,6	343123098,9	154762522	105692416,2	520845400,2	352200588
	EBIT	1548826154	1338393218	484184124	532611218,1	-1940547898	2508368342
	NOPAT	**1254549185**	**1084098507**	**392189140,4**	**431415086,7**	**-1571843797**	**2031778357**
AOM	Result of exploitation	2714573,51	921265,03	-3893163	22227467	25105161	30075380,63
	Financial expenses	1254980,31	0	0	4074	0	0
	EBIT	3969553,82	921265,03	-3893163	22231541	25105161	30075380,63
	NOPAT	**3215338,594**	**746224,6743**	**-3153462,03**	**18007548,21**	**20335180,41**	**24361058,31**

Source: Prepared by the researcher Based on the financial statements of the study sample companies for the period (2018-2023).

- ***Calculate Invested Capital (IC)***: We use the liabilities approach.

Table (06): Invested capital (IC) during the Period (2018-2023)

	Statement	2018	2019	2020	2021	2022	2023
ALL	Equity	3427570433	4397291909	5096135992	5306881352	5509801982	5609277794
	Net debt	-1167055982	-1146935269	-1099429331	-1108610972	-1444813503	-1977373096
	IC	**2260514451**	**3250356639**	**3996706661**	**4198270380**	**4064988479**	**3631904699**
B	Equity	33069000000	37737000000	40416000000	45293000000	49258085914	54366865566
	Net debt	-2161000000	237000000	-131000000	-584000000	-1040280719	7857279544

IO	***IC***	**30908000000**	**37974000000**	**40285000000**	**44709000000**	**48217805195**	**62224145110**
AUR	**Equity**	4960025012	4853429113	4081270125	3565189575	3509395374	3967192288
	Net debt	3497699386	3554659888	3782031740	3744508883	3454656895	2651380640
	IC	**8457724398**	**8408089002**	**7863301864**	**7309698458**	**6964052269**	**6618572928**
SAI	**Equity**	19796410397	21776278416	22234554787	22912568215	18965371886	21924496338
	Net debt	8390562524	9277261399	8542726432	10391353430	12252633409	13374055223
	IC	**28186972921**	**31053539816**	**30777281219**	**33303921645**	**31218005295**	**35298551561**
AOM	**Equity**	118814654,4	119564966,5	460371953	532566875	547101167,4	565216870
	Net debt	211090130,1	291842389	304312016	219820701	211671391,2	290357344,6
	IC	**329904784,5**	**411407355,4**	**764683969**	**752387576**	**758772558,6**	**855574214,6**

Source: Prepared by the researcher Based on the financial statements of the study sample Company for the period (2018-2023).

- ***Determine the Weighted Average Cost of Capital (WACC)***

- ***Calculate the Cost of debt before tax*:** It was calculated by applying the relationship: **Financial expenses / financial debts**

Table (07): Cost of debt before tax during the Period (2018-2023)

	2018	**2019**	**2020**	**2021**	**2022**	**2023**
ALL	0%	0%	0%	60%	175%	604%
BIO	130%	3.70%	26%	8.20%	18%	5.80%
AUR	4%	2.10%	1.40%	0.18%	0.64%	0.17%
SAI	2.30%	3.30%	1.48%	7.64%	3.60%	2.40%
AOM	0.52%	0%	0%	0%	0%	0%

Source: Prepared by the researcher Based on the financial statements of the study sample companies for the period (2018-2023).

- ***Calculate the cost of equity*:** Using the capital asset pricing model:

  R = Rf + Bc [Rm - Rf]

  - **Risk-free rate return (Rf):** It is the annual return rate on treasury bonds issued by the Algerian government for 10 years, which is equal to 5% during the study period;
  - **Market return (Rm):** Calculated based on the value of Algerian Stock Exchange Index Known as the Dzair index, which includes its composition (04) companies from the study sample, which are: Alliance Insurances, Biopharm, Egh EL Aurassi and Saidal, the following table shows its value during the study period.

Table (08): The value of the Dzair index during the Period (2018-2023)

	1	2	3	4	5	6	7	8	9	10	11	12
2018	1172	1134	1200	1198	1207	1263	1355	1426	1445	1444	1470	1431
2019	1456	1437	1430	1433	1498	1552	1558	1567	1583	1594	1587	1588
2020	1590	1568	1568	1570	1570	1570	1590	1601	1606	1659	1667	1719
2021	1719	1723	1749	1769	1782	1773	1775	1796	1812	1872	1938	1976
2022	1976	1989	1994	2015	2164	2485	2548	2637	2641	2684	2785	3113
2023	3434	3499	3646	3639	3680	3657	3656	3658	3677	3691	3549	3489

Source: the Algerian Stock Exchange website https://www.sgbv.dz, Consulted on: 03-01-2025.

The market return (Rm) was calculated using the arithmetic average of the monthly percentage change in the index value for each year, as shown below:

Table (09): Market return (Rm) during the period (2018-2023)

	2018	2019	2020	2021	2022	2023
Rm	0.2073	0.0886	0.0792	0.141	0.3594	0.03484

Source: Prepared by the researcher Based on the previous table.

- **Systematic risk factor for the share (ß):** It was calculated by dividing the covariance of the share return and the market return by the market return variance; this is for every company and for every year.

Table (10): Systematic risk factor for the share (ß) for the Period (2018-2023)

		2018	2019	2020	2021	2022	2023
		Rm var	**Rm var**	**Rm var**	**Rm var**	**Rm var**	**Rm var**
		0,00109081	0,00027835	0,00017524	0,0001437	0,0017670	0,00037014
ALL	**cov**	-0,00030278	-2,2662E-05	-1,9974E-06	0,00064445	-0.00009896	-9,4864E-05
	ß	-0,27757576	-0,08141475	-0,01139842	4,484679673	-0,05600599	-0,25629532
BIO	**cov**	0,00101312	0,00030155	0,00012354	0,00017647	0,00073999	0,00016536
	ß	0,92877375	1,08335849	0,70499781	1,22805679	0,41875900	0,44675107
AUR	**cov**	-0,00026497	7,97841E-05	-6,1714E-06	-1,3426E-05	-0,00122050	-7,964E-05
	ß	-0,24291753	0,28663198	-0,03521767	-0,09343227	-0,69065579	-0,2151639
SAI	**cov**	-0,00795366	4,99772E-05	0,00019058	6,69652E-05	-2,3486E-07	-1,7464E-05
	ß	-7,29150392	0,17954781	1,08756213	0,46600726	-0,00013291	-0,04718198
AOM	**cov**	0	-0,00056262	0	0	6,75546E-06	2,64072E-05
	ß	0	-2,0212360	0	0	0,00382288	0,07134452

Source: Prepared by the researcher Based on the Algerian Stock Exchange website https://www.sgbv.dz, Consulted on: 03-06-2025.

Using the model the CAPM model, we can calculate the cost of equity.

Table (11): the cost of equity Capital during the period (2018-2023)

	2018	2019	2020	2021	2022	2023
ALL	0,6337%	4,686%	4,967%	27,61%	3,273%	5,388%
BIO	19,61%	9,182%	7,058%	16,17%	17,96%	4,323%
AUR	1,179%	6,106%	4,897%	4,149%	3,910%	5,326%
SAI	11,45%	5,693%	8,176%	9,241%	4,996%	5,071%
AOM	5%	2,802%	5%	5%	4,994%	4,892%

Source: Prepared by the researcher Based on the above.

- **Determine the Weighted Average Cost of Capital (WACC):**

Table (12): the cost of capital (WACC) during the Period (2018-2023)

	2018	2019	2020	2021	2022	2023
ALL	0,6337 %	4,686%	4,967%	27,74%	3,756%	5,917%
BIO	19,18%	8,656%	8,204%	15,37%	17,73%	4.367%
AUR	2,132%	3,976%	2,907%	1,886%	1,991%	2,547%
SAI	8,044%	4,717%	5,951%	8,092%	4,103%	3,825%
AOM	1,66%	0.7954%	2,992%	3,168%	3,199%	3,171%

Source: Prepared by the researcher Based on the above.

- **Calculate the Economic Value Added (EVA):** After calculating both the (NOPAT), the (CI), and the (WACC), all that remains for us is to calculate the economic value added (EVA).

Table (13): Economic Value Added (EVA) during the Period (2018-2023)

	2018	2019	2020	2021	2022	2023
ALL	250656444	134377087	120608112,7	-812435173,9	273635335,9	109129897,3
BIO	1152905865	4432216020	3476398719	1361177998	213888496,3	6365399001
AUR	522752640,3	146657338,2	-672661957,5	-537491820,3	-47938494,65	230537503,2
SAI	-1012701420	1080848389	-1439545073	-2263545499	-2852794467	681733040,6
AOM	-2261378,756	-2503893,326	-26034389,16	-5832177,12	-3943413,025	-2771282,665

Source: Prepared by the researcher Based on the above.

IV.2 Results Analysis

IV.2.1 Statistical description of study variables

Table (14): Descriptive Statistics of the Variables

statistiques descriptives					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
		value	**value**	**value**	**value**
P	30	257,00	2 472,00	666,41	473,55166
ROE	30	-0,16	0,23	0,0595	0,09579
ROA	30	-0,07	0,14	0,0340	0,04738
EVA	30	-2 852 794 467	6 365 399 001	362 348 714,94	1 775 936 588,9
N	30				

Source: Prepared by the researcher based on the outputs of the SPSS software.

The table shows the mean value of P, ROE, ROA, and EVA as 666.41, 0.0595, 0.0340 and 362 348 714.94 respectively. The standard deviation of P, ROE, ROA, and EVA from their respective mean values point at 473.55166, 0.09579, 0.04738 and 1775936588.9.

IV.2.2 Normal Distribution of Variables

Table (15): Results of the Normality Test

Statistiques descriptives				
Variables	**Skewness**		**Kurtosis**	
	Value	**Erreur standard**	**value**	**Erreur standard**
P	2,457	0,427	6,767	0,833
ROE	-0,744	0,427	0,719	0,833
ROA	-0,139	0,427	0,506	0,833
EVA	1,663	0,427	4,514	0,833
N valide	1- 1		-3 3	

Source: SPSS software outputs.

The normality of the variable data is verified through the calculation of skewness and kurtosis coefficients, regarding the coefficient of Skewness the values are exceeding ±1 are generally indicative of substantial skewness. In this context (P) and (EVA) exhibit significant positive skewness, suggesting the presence of a few extremely high values (i.e., outliers), (ROE) shows mild negative Skewness, implying the existence of some lower-than-average values, (ROA) appears to be relatively balanced, which supports its stability in modeling applications. For the kurtosis coefficient, the normal value is approximately 3, which corresponds to a normal distribution, But the results of the table show that (P) and (EVA) have elevated kurtosis values (> 3), indicating a leptokurtic distribution and a higher likelihood of outliers that may affect the mean and regression estimates, while (ROE) and (ROA) show lower-than-normal kurtosis values, reflecting a more Platykurtic distribution, meaning the data are more evenly dispersed with fewer extreme values. In general, data that does not follow a normal distribution.

IV.2.3 Hypotheses Testing and analysis

After verifying the condition of normality for the distribution, it was found that the data of the variables do not follow a normal distribution. Therefore, we cannot apply linear regression; instead, we resort to nonlinear regression. Based on the value of R^2 for the nonlinear regression models, we concluded that the model Cubique is the most explanatory of the effect of the independent variables on the dependent variable.

The general cubic of the form: $ax^3 + bx^2 + cx + d$ (Tiruneh, 2020, p. 1), we will test the effect of each independent variable on the dependent variable separately; the procedures for verifying the study hypotheses were as follows:

a) Testing and analyzing the first hypothesis: Impact of (ROE) on (P)

- H0: There is no statistically significant effect between the return on equity (ROE) and the market price of the study sample companies' shares (P) at the $\alpha = 0.05$ error level;

- H1: There is a statistically significant effect between the return on equity (ROE) and the market price of the study sample companies' shares (P) at the $\alpha = 0.05$ error level.

Table (16): Results of the non-linear regression statistical test for the effect of (ROE) on (P)

	Regression equation		F test		T test		R	R^2
	B Coefficients	Erreur standard	F valu	Sig	T value	Sig	0.65	0.42
constant	372.49	131.019	6.24	0.002	2.843	0.009		
ROE	1320.16	1 801.39			0.733	0.470		
ROE^2	17207.53	8 034.11			2.142	0.042		
ROE^3	1444.52	65 985.5			0.022	0.983		
Régression Model			**$P = 1320.16 \times ROE + 17207.53 \times ROE^2 + 1444.52 \times ROE^3 + 372.49$**					

Source: Prepared by the researcher based on the outputs of the SPSS software.

Show the table results that the F-value reached 6.24, which is statistically significant at a significance level of 0.002. This indicates the existence of a statistically significant effect of the independent variables (ROE, ROE^2, and ROE^3) on the dependent variable (P). As for analysis of B Coefficients, (ROE) is not statistically significant (T= 0.733, Sig= 0.470), suggesting that its individual effect is not meaningful within the model, while (ROE^2) is Statistically significant (T= 2.142, Sig= 0.042), indicating that the squared term of ROE has a notable impact on the dependent variable, as for (ROE^3**)** is not statistically significant (T= 0.022, Sig= 0.983), meaning its effect is negligible, this is supported by the correlation coefficient value of 0.65, indicating a Moderat positive relationship between the dependent variable and the independent variables, the coefficient of determination R^2 was 0.42, meaning that 42% of the variations in the average market price of shares (P) can be attributed to changes in (ROE, ROE^2, and ROE^3)**,** while the remaining 58% are due to other factors not included in the model, The model can thus be represented as follows:

$$P = 1320.16 \times ROE + 17207.53 \times ROE^2 + 1444.52 \times ROE^3 + 372.49$$

Accordingly, the null hypothesis is rejected, and the alternative hypothesis is accepted.

b) Testing and analyzing the Second hypothesis: Impact of (ROA) on (P)

- H0: There is no statistically significant effect between the return on Assets (ROA) and the market price of the study sample companies' shares (P) at the $\alpha = 0.05$ error level;
- H1: There is a statistically significant effect between the return on Assets (ROA) and the market price of the study sample companies' shares (P) at the $\alpha = 0.05$ error level.

Table (17): Results of the non-linear regression statistical test for the effect of (ROA) on (P)

	Regression equation		F test		T test		R	R^2
	B Coefficients	Erreur standard	F valu	Sig	T value	Sig	0.73	0.54
constant	261.03	114.84	10.15	0.00	2.273	0.032		
ROA	4848.64	2 482.83			1.953	0.062		
ROA^2	125195.72	42 269.55			2.962	0.006		
ROA^3	-710799.06	411 827.7			-1.726	0.096		
Régression Model			**$P = 4848.64 \times ROA + 125195.72 \times ROA^2 - 710799.06 \times ROA^3 + 261.03$**					

Source: Prepared by the researcher based on the outputs of the SPSS software.

From the table results it is clear that the F-value reached 10.15, which is statistically significant at a significance level of 0.000. This indicates the existence of a statistically significant effect of the independent variables (ROA, ROA^2, and ROA^3) on the dependent variable (P). As for analysis of B Coefficients, (ROA) is not statistically significant (T= 1.953, Sig= 0.062), close to significance but not within the 0.05 threshold, while **(ROA^2)** is Statistically significant (T= 2.962, Sig= 0.006), meaning (ROA) squared has a strong influence on the dependent variable, As for **(ROA^3)** is not statistically significant (T= -1.726, Sig= 0.096), suggesting its effect is weak and not meaningful, this is supported by the correlation coefficient value of 0.73, indicating a moderately strong positive relationship between the dependent variable and the independent variables, the coefficient of determination R^2 was 0.54, meaning that 54% of the variations in the average market price of shares (P) can be attributed to changes in (ROA, ROA^2, and ROA^3)**,** while the remaining 46% are due to other factors not included in the model. The model can thus be represented as follows:

$$P = 4848.64 \times ROA + 125195.72 \times ROA^2 - 710799.06 \times ROA^3 + 261.03$$

Accordingly, the null hypothesis is rejected, and the alternative hypothesis is accepted.

c) Testing and analyzing the Third hypothesis: Impact of (EVA) on (P)

- H0: There is no statistically significant effect between the Economic value added (EVA) and the market price of the study sample companies' shares (P) at the $\alpha = 0.05$ error level;
- H1: There is a statistically significant effect between the Economic value added (EVA) and the market price of the study sample companies' shares (P) at the $\alpha = 0.05$ error level.

Table (18): Results of the non-linear regression statistical test for the effect of (EVA) on (P)

	Regression equation		F test		T test		R	R^2
	B Coefficients	Erreur standard	F valu	Sig	T value	Sig	0.82	0.67
constant	539.71	60.443	17.62	0.000	8.93	0. 000		
EVA	8.879E-8	0.000			1.58	0.126		
EVA^2	2.786E-17	0.000			-	-		
EVA^3	5.052E-28	0.000			-	-		
Régression Model			**P = 8.879E-8 × EVA +2.786E-17 × EVA^2 + 5.052E-28 × EVA^3 + 539.71**					

Source: Prepared by the researcher based on the outputs of the SPSS software.

From the table results it is clear that the F-value reached 17.62, which is statistically significant at a significance level of 0.000. This indicates the existence of a statistically significant effect of the independent variables (EVA, EVA2 and EVA3) on the dependent variable (P). As for analysis of B Coefficients, (EVA) is not statistically significant (T= 1.58, Sig= 0.126), indicating that EVA's individual contribution is not meaningful, while **(**EVA^2) and (EVA^3) No T-test or significance values were reported (indicated by dashes), suggesting that their effects were either not estimated separately or considered negligible. As for the correlation coefficient value of 0.82, indicating a strong positive relationship between the dependent variable and the independent variables, the coefficient of determination R^2 was 0.67, meaning that 67% of the variations in the average market price of shares (P) can be attributed to changes in (EVA, EVA^2,and EVA^3)**,** while the remaining 33% are due to other factors not included in the model, which indicates good explanatory power. The model can thus be represented as follows:

P = 8.879E-8 × EVA +2.786E-17 × EVA^2 + 5.052E-28 × EVA^3 + 539.71

Accordingly, the null hypothesis is rejected, and the alternative hypothesis is accepted.

IV.2.4 Comparison between models and Discuss the results

Table (19): Final Comparative summary and discuss the results

Model	R	R^2	F-statistic	Significance	Evaluation
Model 1 (ROE)	0.65	0.42	6.24	0.002	Weakest
Model 2 (ROA)	0.73	0.54	10.15	0.000	Intermediate
Model 3 (EVA)	0.819	0.67	17.62	0.000	Best

Source: Prepared by the researcher based on the outputs of the SPSS software

Comparing the three models (ROE, ROA and EVA) shows that in terms of explanatory power, the third model (EVA) is unequivocally the best, where:

- It provides the highest R^2 value (0.67);
- The model is highly statistically significant (Sig = 0.000 and F = 17.62);

- It also exhibits the highest correlation coefficient, R (0.819).

V. Conclusion

Finally, below we will present the most important results of the study and some recommendations for applied research companies.

V. 1 Results

The applied study reached a set of results, the most important of which are:

- The return on equity (ROE) of the sample companies fluctuated significantly over the study period. Some companies, such as (BIO), achieved high and consistent performance, placing them in a strong position to attract investors seeking companies with operational efficiency and high profitability. Meanwhile, other companies, such as (AUR) and (SAI) Recorded negative returns in (2020–2022) they went through periods of crisis or declining financial performance, as for (ALL), it has witnessed a gradual decline in (ROE) over the years of study, which may be worrying if it continues, (AOM), on the other hand, recorded very modest levels at the beginning of the study period and suffered losses in 2020. However, it showed gradual improvement year after year, reaching 5.32% in 2023, demonstrating increased efficiency and profitability over time;
- As for the rate of return on assets (ROA), the results showed that Company (ALL) recorded a continuous decline in (ROA) over the past six years, indicating a gradual decline in the efficiency of using assets to generate profits, as for Company (BIO), despite some declines, it has maintained a relatively high (ROA) compared to other companies, reflecting its high efficiency in converting assets into profits, While (AUR) recorded losses in (ROA) in 2020 and 2021, but recovered by 2023, indicating a successful readjustment of operating and financing strategies, the same observation was recorded at the level of (SAI), which went through a period of severe weakness. that culminated in 2022 with a negative (ROA) (-6.66%), but showed a clear improvement in 2023, as for (AOM), despite its initially weak levels, it showed gradual and continuous growth until the end of the period, indicating improved company operations and increased operational efficiency;
- As for the Economic Value Added (EVA), the results showed that (ALL) recorded extremely volatile performance, with a collapse with a negative value (-812 million) in 2021, indicating a significant economic loss, Due to the high cost of capital (27,74%), followed by a relative recovery, Where (EVA) returned to positive values, but at medium levels (273 million then 109 million). While (BIO)'s results have proven its overall performance to be good, with (EVA) recording a huge jump in 2019 (4.43 billion), remaining high in 2020 (3.47 billion), but declining in 2021 to 1.36 billion, then to 213 million in 2022, before quickly recording a massive recovery in 2023 (6.36

billion), its highest value. Overall, (BIO) has been able to create economic value despite some fluctuations. As for (AUR)'s performance, it has been highly volatile. It recorded a positive (EVA) value in 2018, followed by sharp declines in 2019, 2020, and 2021, where it recorded negative values (-146), (-672), and (-537) million, respectively, these losses then decreased to (-47.9 million) in 2022, before recovering in 2023 to reach (230 million). The same observation applied on (SAI)'s performance, which has been generally volatile and very poor, in 2018, it recorded a huge loss (-1.01 billion), then recovered in 2019 and created value (1.08 billion), however, it quickly declined and incurred huge losses in the period (2020–2022), before rebounding in 2023, achieving positive (EVA) (681 million). (AOM) has had a negative performance, according to its (EVA), which has been negative throughout the years, although the negative values are relatively small compared to other companies; the persistence reflects a structural failure to generate any economic value.

- Model (01) Based on (ROE), the overall regression model is significant, with a moderate explanatory power (42%). Among the predictors, only ROE^2 shows a statistically significant effect. (ROE) and (ROE^3) do not individually contribute meaningfully to the model.This model gives an acceptable but not very strong explanation. Accordingly, the null hypothesis is rejected, and the alternative hypothesis is accepted;
- Model (02) Based on (ROA), the second model is statistically better than the first, because it gives greater explanatory power to the dependent variable (P) (R^2= 53.9%), among the variables, only (ROA^2) has a clear and significant impact on the dependent variable, while (ROA) and (ROA^3) are not individually significant. Accordingly, the null hypothesis is rejected, and the alternative hypothesis is accepted;
- Model (03) Based on (EVA), shows the strongest explanatory power with the highest R^2 (0.67) and F-statistic (17.62) among the three models. Despite the individual insignificance of the predictors, the overall model is highly significant statistically, making it the most effective model for explaining variations in the dependent variable (P). Accordingly, the null hypothesis is rejected, and the alternative hypothesis is accepted;

As a conclusion, the third model (EVA-based) is the one that gives the greatest explanatory power to the dependent variable statistically.

V. 2 Recommendations

- To improve return on equity (ROE), it is recommended that the companies: (ALL), (AUR) and (SAI) should develop new product lines or improve existing products to boost profitability, reassess their capital structure to avoid equity inflation without commensurate earnings growth, and enhance

marketing and sales efforts (services) to achieve greater revenue growth while controlling costs;

- To improve return on assets (ROA), it is recommended that (ALL) should restructure its asset investment strategies to enhance returns, Regarding (AUR), it should work on improving operational processes, especially after the negative results recorded in 2020 and 2021, for (SAI), it is recommended to review the strategies that led to a significant decline in return on assets;
- To improve economic value added (EVA), the companies under study should use modern financial indicators in their analysis, rather than relying solely on apparent profitability, (AOM) should reconsider its strategy and diversify its activities to create value for its shareholders, as for (SAI), it should adjust its cost structure and become more flexible in the face of sharp fluctuations, While (BIO) should maintain the positive position by diversifying growth sources and diversifying products further.

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