

Elucidating the Impacts of Profitability on Economic Value Added: An Empirical Study of Pharmaceutical and Chemical Corporations in Jordan

Abdul Razzak Alshehadeh ¹, Lara Fayez Al-Maghareh ¹, Ghaleb Awad Elrefae ²,
Salah Alshehadeh ^{3,*}

¹ Faculty of Business, Al-Zaytoonah University of Jordan, 11700 Amman, Jordan

² College of Business, Al Ain University, 64141 Al Ain, UAE

³ Faculty of Pharmacy & Bio-Medical Sciences, MAHSA University, Selangor 42610, Malaysia
salah_alsh@outlook.com (Corresponding author)

Abstract. This study aimed to elucidate the impact of profitability through its fundamental measures, represented by (return on equity, return on assets, gross profit margin, and operating profit) on the economic value added. The study population comprised companies in the industrial sector listed on the Amman Stock Exchange, totaling (53) companies. The sample consisted of pharmaceutical and chemical companies, numbering (13) companies. To achieve the study's objectives, the applied approach relying on the reports and financial statements of the sample companies was utilized as the main source of study data for the period from 2009 to 2022. Appropriate statistical methods, specifically simple and multiple regression, were employed to test hypotheses and reach conclusions. Previous literature yielded varied and conflicting results regarding the relationship or impact between the variables of this study. Some affirmed a positive relationship, while others argued the opposite concerning the influence of profitability indicators in interpreting changes in economic value added. The results of this study indicate that it contributed to the ongoing debate by providing statistical evidence of a strong and positive impact of profitability indicators (return on equity, return on assets, gross profit margin, and operating profit) at varying degrees in explaining changes in economic value added. These results urge industrially listed companies on the Amman Stock Exchange to adopt the EVA indicator, outlining its preparation method, for inclusion in financial performance evaluation indicators alongside traditional performance indicators. This is recommended for investor reliance in making decisions related to buying and selling company stocks.

Keywords: Profitability, Economic Value Added, Pharmaceutical and Chemical Companies

1. Introduction

With the intensification of competition, scarcity of financial resources, and the current high cost of capital, companies are compelled to seek ways and methods that enable them to sustain and achieve acceptable levels of performance in all its forms, especially financial performance (Jagathi, 2022). The modern view of financial management focuses on maximizing the wealth of shareholders and stakeholders through maximizing the Economic Value Added (EVA) for the company, thereby contributing to the continuity of business activities (Tripathi, 2018). Numerous studies have explored the nature of the relationship and impact between EVA and financial performance on one hand, and stock market values on the other. This is in an effort to assist financial managers and stakeholders interested in the company's economics in comparing traditional performance evaluation methods with EVA as a basis for making informed decisions. These decisions aid in achieving the main goal of financial management, which is the maximization of shareholder wealth and the assessment of company performance (Abdoli, 2012). Currently, global and local companies show increased interest in studying factors that create economic value. The driving force behind this interest is the heightened competition and the more effective attention of investors. Investors and other stakeholders now expect companies to achieve better performance levels (Al-hourani, 2018).

Maximizing shareholder and stakeholder wealth is considered the primary goal for all profit-oriented companies, regardless of their nature and type. This is achieved by motivating and directing all activities towards increasing the company's value. EVA is one of the key financial indicators that illustrates the change in the wealth of shareholders and lenders from an economic perspective, rather than an accrual-based accounting perspective (Vijayakumar, 2012). EVA is not only a multidimensional method for evaluating management performance in utilizing company resources, but also a tool used by management as an indicator to demonstrate its duties towards stakeholders by creating added value for the company's business results (Manríquez, 2021).

The primary goal of any economic and financial activity is to achieve positive cash flows manifested in profits that lead to maximizing shareholder wealth (Tripathi, 2018). Profitability serves as a tool to measure the efficiency of investment, operational, and financial management policies, indicating their ability to achieve positive current and future results and suitable returns compared to the available resources. This, in turn, leads to value creation for the company (St-Hilaire & Boisselier, 2018). Currently, shareholders and investors have an increasing need for mechanisms to help them interpret the causes of changes in their wealth. The EVA indicator has emerged as one of the best mechanisms for explaining such changes (Obaidat, 2019). Based on the above, the main objective of this study is to illustrate the impact of profitability with its basic financial indicators on achieving EVA for Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange.

Various traditional performance evaluation indicators have been introduced with the evolution of accounting thought, using profitability as a criterion to judge the financial performance of companies. However, the flaws and criticisms directed at this criterion have led to the adoption of a broader and more comprehensive perspective from the accounting viewpoint to evaluate performance. This new perspective aims to assess the company's ability to create value for shareholders or stakeholders. The EVA indicator was introduced as a method for evaluating the company's management performance in creating value for shareholders and interested parties (Omneya et al., 2021). Maximizing shareholder and stakeholder wealth is one of the most important goals that companies seek to achieve, giving this goal the utmost priority. Changes in shareholder and stakeholder wealth are measured by the return they earn on their investment. This return should lead to a change in the EVA for the company. Given the contrasting results of previous studies, this study aims to answer the following main question: Does profitability have an impact on the EVA of Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange? This main question gives rise to the following sub-questions:

1. Does the return on equity have an impact on the EVA for Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange?

2. Does the return on assets have an impact on the EVA for Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange?
3. Does the gross profit margin have an impact on the EVA for Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange?
4. Does the operating profit margin have an impact on the EVA for Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange.

2. Literature review

2.1. Economic Value Added (EVA) and Performance Evaluation

EVA is considered the most successful performance measure used by many global companies and their consultants. On one hand, it serves as a gauge for the company's financial performance, and on the other hand, it represents a powerful tool and metric for improving company performance and achieving greater returns for shareholders. It is not just a performance measure but can be a key component of an integrated financial management system (Mangni, 2008). Currently, there is significant pressure on executives in various economic sectors to achieve growth in shareholder and stakeholder wealth. This task is inevitable and must be accomplished through investing in projects that generate cash flows exceeding the cost of capital (Alshehadeh et al., 2022a). In the present century, driven by globalization, the knowledge economy, and technology, companies must compete in dynamic and evolving markets. One of the primary goals for every company is to create value for its shareholders and stakeholders. This value is generated through the proper utilization of existing resources (Manríquez, 2021). Until recently, the accounting profit criterion was an indicator of a company's performance. However, this criterion faced numerous criticisms, prompting stakeholders to seek alternative standards. Thus, EVA emerged as a method that can be used to interpret changes in shareholder and stakeholder wealth over a period, often reflected in stock value changes in capital markets (Daraban, 2017).

On the other hands, modern financial theory underscores that the paramount goal of any economic entity lies in the maximization of wealth for both shareholders and creditors, concomitant with enhancing the market value of the entity in financial markets. This pursuit hinges on a set of activities designed to generate and bestow additional value (Kadar & Rikumahu, 2018). In the contemporary landscape of value assessment, one of the foremost methodologies is the EVA metric. EVA serves as a versatile tool for appraising strategies, evaluating investment ventures, establishing financial performance targets, and subsequently assessing their attainment. The EVA framework has emerged as a paradigm shift in the evaluation of company performance, emphasizing economic profit over conventional accounting-based profit metrics (Ismail, 2013). This modern paradigm for performance assessment is rooted in the concept that managerial efficiency hinges on the ability to yield profitability that surpasses the cost of capital, irrespective of its origin. When profitability eclipses the cost of capital, it engenders wealth or adds value to shareholders. Conversely, when the cost of capital exceeds profitability, it culminates in wealth dissipation (Alshehadeh et al., 2022). By anchoring the evaluation of managerial performance in its capacity to foster shareholder wealth, organizational objectives align with those of shareholders, mitigating conflicts of interest and curtailing agency costs (Vijayakumar, 2012).

The EVA equation stands out by incorporating the cost of capital in the calculation. Through traditional accounting methods, companies may appear profitable, but many of them are, in fact, the opposite. Therefore, EVA corrects this accounting error by taking the cost of capital into account. It compels managers to work towards creating value that exceeds the cost of the capital they utilize in their projects (Nugroho, 2018).

The concept of EVA has surfaced as a pivotal gauge for assessing financial performance and has gained prominence since the 1990s. EVA not only assesses profitability but also serves as a means to scrutinize both internal and external performance. Furthermore, it aids in ascertaining the economic viability and advisability of projects, predicated on whether they have generated a positive value or not

(Nufazil, 2016). Defined as a measure of financial accomplishment, EVA is considered to be the closest approximation to real profit. It encapsulates the endeavor to maximize wealth for shareholders and creditors by calculating the discrepancy between post-tax adjusted operating profit and the total cost of capital, whether derived from equity or debt (Johan, 2019). This metric is underpinned by two fundamental tenets in decision-making (Nugroho, 2018):

1. The ultimate objective of every company, irrespective of its nature of operations, should be the maximization of wealth and value for both shareholders and stakeholders.
2. The worth of any company hinges on the anticipation that future profits will surpass the cost of capital.

In the delineation of EVA, Ramana (2005) underscores that it represents the economic book value of capital at the outset of the fiscal year, coupled with the disparity between capital returns and its cost. Al-hourani (2018) characterizes EVA as a metric that harmonizes three profitability facets: returns for shareholders, economic profits, and accounting profits. The EVA index is defined as the value of the economic profit for the company, as it represents the surplus value that led to a change in the wealth of the company's shareholders. Thus, EVA is the profit earned by the company at the lowest cost of internal or external financing (Teker, 2011). EVA is defined as the return on investment achieved after deducting all elements of the cost of capital, whether through external financing or through internal financing by the shareholders (Alqudah et al., 2023).

2.2. Measuring EVA

The calculation of the EVA metric relies on three fundamental components:

1. NOPAT (Net Operating Profit After Tax): This signifies the net operating profit after taxes.
2. WACC (Weighted Average Cost of Capital): This reflects the weighted average cost of capital.
3. IC (Invested Capital): This represents the capital that has been invested.

The EVA indicator is computed financially using the following formula (Obaidat, 2019; Shil, 2009):

EVA = Net profit derived from operating activities after taxes - (Weighted Average Cost of Capital * Invested Capital)

$$EVA = NOPAT - (WACC * IC)$$

Net Operating Profit After Tax (NOPAT) is calculated through the following equation (Johan, 2019):

$$NOPAT = EBIT (1 - \text{Tax Rate})$$

Where, earnings before interest and tax (EBIT) represents operating profits before considering interest and taxes.

The Weighted Average Cost of Capital (WACC) is computed by the following equation, as per Shil (2009) and Johan (2019):

$$WACC = CoD \times (\text{Debt}/(\text{Debt} + \text{Equity})) \times (1 - \text{Tax Rate}) + CoE \times (\text{Equity}/(\text{Debt} + \text{Equity}))$$

Where,

Cost of Debt (CoD): This pertains to the expenses associated with debt.

Cost of Equity (CoE): It refers to the costs linked with shareholders.

Debt (D): Represents the obligations owed to debt holders.

Equity (E): Signifies the ownership held by shareholders.

The calculations for the costs of equity and debt were as follows:

$$CoD = \text{Interest Expense}/\text{Average Bank Loan Outstanding}$$

$$CoE = \text{Net Profit}/\text{Average Equity}$$

The Invested Capital (IC) is ascertained by combining working capital and net fixed assets (Johan, 2019):

$$\text{Invested Capital} = \text{Working Capital} + \text{Net Fixed Assets}$$

Working capital, a vital aspect for investors and financiers, is calculated in the following manner:

$$\text{Working Capital} = \text{Current Assets} - \text{Current Liabilities}$$

2.3. Profitability and its Measurement

Companies are driven by a fundamental objective, the pursuit of sustainability through the acquisition of a market share that ensures their ongoing efficiency and effectiveness (Al-Zaqeba et al., 2022). Among the key tenets underpinning this mission is profitability, a linchpin of paramount importance (Alshehadeh, 2021). Profitability assumes the role of a cornerstone that corporations endeavor to attain, for it underpins their financial resilience, fosters trust among customers, escalates competitive standing within industries, and garners the attention of investors. Companies direct their efforts towards augmenting profits, seeking to maximize positive cash flows while minimizing associated costs (Rahaman et al., 2018).

Profitability stands as an overarching objective for entities driven by profit motives, serving as an indispensable element for their perpetual existence and endurance (Qirem et al., 2023). It also operates as an invaluable metric for appraising management's adeptness in resource allocation. It epitomizes the correlation between the profits realized and the investments instrumental in their realization. The assessment of profitability can manifest in two dimensions: the nexus between profits and sales or the linkage between profits and the investments pivotal to the profits (Salman et al., 2017).

Furthermore, profitability represents the company's ability to generate income, and profit analysis is of utmost importance to shareholders, as the profits they receive are derived from the realized profit value (Al-Chahadah et al., 2020). The value of realized profits is also highly significant for creditors, enabling them to assess the ability to repay their debts. Profitability serves as an indicator of the current and future financial performance of the company (Elrefae et al., 2024).

Profitability is defined as the "net result of a number of policies and decisions that reflect the effectiveness of business operations in its operational activities" (Ehrhardt & Brigham, 2017). Rafathunnisa (2021) defines it as an indicator of good financial health and the efficiency of business management for its operational activities, demonstrating its ability to achieve positive current and future cash flows and appropriate returns. Profitability, from another perspective, is a measure to interpret the operational efficiency of business establishments and is the outcome of optimal use of available resources (Alshehadeh, 2021).

Thus, profitability signifies the company's ability to generate revenue through available resources and investments, which should exceed the incurred expenses over a period of time. The higher this indicator, the greater the satisfaction of investors, creditors, and management with the business results (Al Omari et al., 2017).

Profitability, in its broad sense, reflects the company's ability to achieve profit, or in other words, its ability to generate current and future cash flows (Oudat et al., 2020). Thus, profitability signifies the relationship between profits and sales, or the correlation between profits and investments that contributed to the company's earnings (Alsmadi et al., 2023). Profitability serves as a gauge for the efficiency of the company and its sustainability, helping to determine whether the company succeeds or fails in achieving its objectives (Salem et al., 2019).

The evaluation of a company's profitability encompasses various key indicators that gauge the efficiency with which they employ and manage their financial resources. Among these indicators, the following assume paramount significance (Ali et al., 2018; Ross et al., 2016):

1. Return on Assets (ROA): This indicator assesses a company's proficiency in deriving profits from its invested assets, elucidating the effectiveness in resource utilization. ROA delineates the capability of assets to generate income, irrespective of their funding source, be it the company's equity or external sources. This metric holds immense importance for both company management and stakeholders, such as shareholders and creditors. A higher ROA signifies the optimal use of available resources, underscoring the company's commitment to generating relatively higher profits in comparison to its asset base. ROA is typically calculated using the following equation (Al Omari et al., 2017):

$$ROA = (\text{Net Income After Taxes} + (\text{Interest Expense} \times (1 - \text{Tax Rate}))) / \text{Average Total Assets}$$

2. Return on Equity (ROE): This measure serves as a key financial performance gauge, unveiling the returns that the company secures from shareholders' investments. ROE reflects the correlation between net profits after taxes and the magnitude of investments made by shareholders (Kadar & Rikumahu, 2018). Equity encompasses shareholders' ownership, encompassing undistributed profits and reserves. It functions as a metric that appraises the returns yielded through shareholder fund investments. A higher ROE underscores the efficiency of resource utilization by management. However, an elevated value may also suggest increased risk due to the company's propensity to rely on loans for its operations while achieving a lower return on assets (Rahaman et al., 2018). The calculation of this indicator follows the equation (Alshehadeh et al., 2022):

$$ROE = \text{Net Income After Taxes} / \text{Average Total Equity}$$

3. Gross Profit Margin (GPM): This metric assumes a pivotal role in assessing a company's effectiveness in cost control to optimize profits derived from core activities. GPM is instrumental in gauging a company's ability to accrue profits from its primary operations (Alshehadeh, 2021). It is calculated by dividing gross profit by net sales. Since both the numerator and denominator encompass sales figures, GPM serves as a measure of management's adeptness in handling cost components related to goods sold. It also indicates the extent to which sales revenue can be reduced before gross profit becomes negative (St-Hilaire & Boisselier, 2018). The calculation of GPM adheres to the equation (Gibson, 2016):

$$GPM = \text{Gross Profit} / \text{Net Sales}$$

4. Operating Profit Margin Before Interest and Taxes (OPM): OPM underscores a company's capacity to attain operating profits emanating from its core activities. It signifies profitability stemming solely from the primary business operations, delineating the relationship between operating profit and sales (Omneya et al., 2021). This metric is employed as a gauge of operational efficiency since management has limited control over factors such as interest, taxes, and other sources of revenue and loss. Consequently, a meticulous examination of all expense items is imperative to identify expense trends and institute corrective measures. This is indispensable as part of control and performance evaluation (Alshehadeh & Al-Khawaja, 2022). OPM is computed according to the following formula (Gibson, 2016):

$$OPM = \text{Operating Profit Before Interest and Taxes} / \text{Net Sales}$$

These indicators collectively form the bedrock for assessing a company's profitability, unraveling the intricacies of financial performance and resource utilization in the corporate landscape.

3. Methods

3.1. Study Population and Sample:

The study community consists of the sector of Jordanian industrial companies listed on the Amman Stock Exchange, totaling (53) companies. A purposive sample was selected from the field of pharmaceuticals and chemicals, comprising (13) companies from the study community. This sample was chosen for the following reasons: firstly, the homogeneous nature of the activities of these companies, which is not present in the rest of the sector concerning the sample size that represents the community. Secondly, the completeness of primary data and financial reports during the study period from 2009 to 2022. Thirdly, the absence of a suspension of trading their stocks on the stock exchange during the study period.

3.2. Study variables

The independent variable of the study is represented by profitability and its indicators, which include (return on assets, return on equity, gross profit margin, operating profit margin). As for the dependent

variable, it is represented by the EVA.

3.3. Study Hypotheses

Ha: There is a statistically significant impact at the ($\alpha \leq 0.05$) level for profitability indicators in Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange on their EVA.

This hypothesis gives rise to the following sub-hypotheses:

Ha1: There is a statistically significant impact at the ($\alpha \leq 0.05$) level for the return on assets indicator in Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange on their EVA.

Ha2: There is a statistically significant impact at the ($\alpha \leq 0.05$) level for the operating profit margin indicator in Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange on their EVA.

Ha3: There is a statistically significant impact at the ($\alpha \leq 0.05$) level for the gross profit margin indicator in Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange on their EVA.

Ha4: There is a statistically significant impact at the ($\alpha \leq 0.05$) level for Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange on their EVA.

3.4. Study Models

Model 1: Measuring the Impact of Aggregated Profitability Indicators on Added Economic Value

The first model of the study represents aggregated profitability indicators as an independent variable in the added economic value as a dependent variable in Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange, as follows:

$$EVA = \beta_0 + \beta_1ROA + \beta_2ROE + \beta_3GPM + \beta_4OPM + \varepsilon$$

Model 2: Measuring the Impact of Individual Profitability Indicators on Added Economic Value

In this step, the impact of the independent variable "profitability indicators" is measured on the added economic value as a dependent variable in Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange, as follows:

$$EVA = \beta_0 + \beta_1ROA + \varepsilon$$

$$EVA = \beta_0 + \beta_1ROE + \varepsilon$$

$$EVA = \beta_0 + \beta_1GPM + \varepsilon$$

$$EVA = \beta_0 + \beta_1OPM + \varepsilon$$

4. Results:

In this study, the main hypothesis and four sub-hypotheses were tested as follows:

The means, standard deviations, and correlation coefficients between profitability indicators in pharmaceutical and chemical companies listed on the Amman Stock Exchange and their added economic value were calculated, as shown in Table 1.

Table 1: Means, Standard Deviations, and Correlation Coefficients between Profitability Indicators in Pharmaceutical and Chemical Companies Listed on the Amman Stock Exchange and their Added Economic Value.

Variables		Mean	SD	Correlation coefficient	P-value
Dependent variable	EVA	-127572.98	1688063.3		
Independent variables (profitability indicators)	Return on equity	-204.87	2665.64	0.271	0.000**
	Gross profit	24.92	54.11	0.415	0.000**
	Operating profit	-32.92	149.55	0.457	0.000**
	Return on assets	1.46	9.98	0.543	0.000**

**Statistically significant at the significance level ($\alpha = 0.01$)

The table presented above offers valuable insights into the dataset. Specifically, it reveals that the arithmetic mean of the EVA indicator variable stands at a value of 127,572.98, accompanied by a standard deviation of 1,688,063.3. In parallel, the arithmetic means of the Profitability Indicators exhibit a range, spanning from -204.87 to 24.92, with corresponding standard deviations varying from 9.98 to 2,665.62. These indicators encompass key financial metrics such as Return on Equity, Total Profit, Operating Profit, and Return on Assets.

Crucially, the correlation coefficients between these Profitability Impact Indicators and the EVA indicator exhibit a spectrum of values, ranging from 0.271 to 0.543. Importantly, all of these coefficients attain statistical significance at the ($\alpha \leq 0.05, 0.01$) significance levels. The suite of indicators, comprising Return on Equity, Total Profit, Operating Profit, and Return on Assets, collectively evinces a moderate positive relationship with the EVA indicator. This implies that as the Profitability Indicators escalate, the EVA indicator for pharmaceutical and chemical companies listed on the Amman Stock Exchange registers a corresponding increase.

In an endeavor to further dissect the potential for predicting Profitability Indicators (specifically Return on Equity, Total Profit, Operating Profit, and Return on Assets) through the EVA indicator within the cohort of Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange, a comprehensive examination was undertaken. This examination culminated in the calculation of multiple correlation coefficients between the Profitability Indicators and the EVA for this cohort. The outcomes of this analysis are methodically presented in Table 2.

Table 2: Summary of Multiple Regression Testing of Profitability Indicators on EVA

Dependent variable	Correlation coefficient (R)	Correlation coefficient (explained variance) (R^2)	Adjusted correlation coefficient (R^2)	F-value	Independent variables	Non-Standard coefficients	Standard error	Standard coefficients	T-value	P-value
EVA	0.603	0.464	0.348	23.285	Constant	139677.01-	146362.20	--	0.954-	0.341
					ROA	93.388	43.50	0.147	2.147	0.033*
					OPM	1640.880	3032.81	0.053	0.541	0.589
					GPM	2858.269	1073.66	0.253	2.662	0.009**
					ROE	57924.352	13686.99	0.343	4.232	0.000**

*Statistically significant at the significance level ($p < 0.05$)

**Statistically significant at the significance level ($p < 0.01$)

The insights gleaned from Table 2 are illuminating. Specifically, the absolute value of the correlation coefficient between Profitability Indicators and EVA stands at a noteworthy 0.603. This coefficient merits statistical significance at the ($\alpha \leq 0.05$) threshold. These findings underscore a positive relationship between these variables. This implies that, in the context of Jordanian industrial companies listed on the Amman Stock Exchange, an upswing in Profitability Indicators corresponds to an augmentation in EVA.

Furthermore, the coefficient of determination ($R^2 = 0.464$) assumes relevance in our analysis. It illuminates that the collective influence of Profitability Indicators explains approximately 46.4% of the variance present in EVA. This statistic signifies that these Profitability Indicators substantially contribute to the variance observed in the EVA.

The calculated F-value was (23.285), and the p-value was statistically significant at the significance levels ($\alpha \leq 0.05, 0.01$). This indicates that the regression model is statistically significant and meaningful, as the regression equation does not equal zero, and there is at least one variable that is statistically significant in the regression model. This implies the acceptance of the current hypothesis, which states that "there is a statistically significant impact at the level ($\alpha \leq 0.05$) for profitability indicators in Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange on their added economic value."

As observed in the above table, it is also noted that the value of the non-standardized coefficient for the regression constant was ($B = -139677.01$) with a standard error of (146362.20). The t-value ($t = -0.954$) is not statistically significant at the significance levels ($\alpha \leq 0.05, 0.01$). Additionally, the non-standardized coefficients for the profitability impact indicators ($B = 93.388-57924.352$) varied with standard errors ranging from (43.50-13686.99), and standardized coefficients ranging from (0.343-0.053). The t-values ($t = 0.541-4.232$) are statistically significant at the significance level ($\alpha \leq 0.05$) for variables (Return on Equity, Operating Profit, Return on Assets). Consequently, the predictive equation is formulated as follows:

Regression Equation: Non-standardized Coefficients

Added Economic Value Index = 93.388 (Return on Equity) + 2858.269 (Operating Profit) + 57924.352 (Return on Assets)

Regression Equation: Standardized Coefficients

Added Economic Value Index = 0.147 (Return on Equity) + 2.662 (Operating Profit) + 0.343 (Return on Assets)

Table 3: Simple Linear Regression Analysis of Variance (ANOVA)

Source of variance	Sum of squares	DF	Mean squares	F-value	P-value
Regression	1.730E+14	4	4.326E+13	23.285	0.000
Residues	3.028E+14	163	1.858E+12		
Total	4.759E+14	167			

*Statistically significant at the significance level ($p < 0.05$)

**Statistically significant at the significance level ($p < 0.01$)

The insights garnered from the presented table are quite revealing. Notably, the value of (F) stands at 23.285, and it attains statistical significance at both the ($\alpha \leq 0.05$ and 0.01) significance levels. This statistical significance underscores the salience of multi linear regression at these designated significance levels. It accentuates the idea that Profitability Indicators wield a substantial influence in forecasting the EVA of Jordanian pharmaceutical and chemical companies. To delve deeper into the magnitude of this impact, we meticulously extracted the regression coefficients, a vital facet of this analysis. These coefficients are comprehensively delineated in Table 4, casting a more nuanced light on the intricate relationships at play within this context.

Table 4: Standard and Non-Standard Simple Linear Regression Coefficients

variable	Unstandardized coefficients		Standard coefficients	T-value	p-value
	β	Standard error	β		
Constant	-139677.005	146362.201	--	-0.954	0.341
Return on equity	93.388	43.497	0.147	2.147	*0.033
Gross profit	1640.880	3032.808	0.053	0.541	0.589
Operating profit	2858.269	1073.661	0.253	2.662	0.009
Return on assets	57924.352	13686.987	0.343	4.232	0.000

*Statistically significant at the significance level ($p < 0.05$)

**Statistically significant at the significance level ($p < 0.01$)

The table provided above offers valuable insights into the regression analysis conducted. Specifically, the absolute value of the non-standard coefficient for the regression constant amounts to $B = -139,677.005$, with a corresponding standard error of 146,362.201. However, the t-value ($t = -0.954$) does not reach statistical significance at the ($\alpha \leq 0.05, 0.01$) threshold.

In contrast, the non-standard coefficients of the profitability indicators (ranging from $B = 93.388$ to $B = 57,924.352$) exhibit a broader spectrum. Standard errors for these coefficients range from 0.343 to 0.053. Importantly, the t-values (ranging from $t = 0.541$ to $t = 4.232$) for the variables, specifically Return on Equity, Operating Profit, and Return on Assets, achieve statistical significance at the ($\alpha \leq 0.05$) significance level.

This empirical analysis culminates in the formulation of a prediction equation, which can be expressed as follows:

Non-Standard Coefficients: $EVA = 93.388$ (Return on Equity) + 2858.269 (Operating Profit) + $57,924.352$ (Return on Assets)

Regression Equation: Standard Coefficients: $EVA = 0.147$ (Return on Equity) + 2.662 (Operating Profit) + 0.343 (Return on Assets)

These equations offer valuable insights into the relationship between the considered variables and the EVA. They provide a quantitative framework for understanding how these profitability indicators predict the EVA of Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange.

Testing Subsidiary Hypotheses

In pursuit of evaluating the key hypotheses in this study, a set of subsidiary hypotheses, denoted as HA1, HA2, HA3, and HA4, were rigorously examined. Each of these hypotheses sought to ascertain the presence of a statistically significant effect at the ($\alpha \leq 0.05$) level for a specific profitability indicator on the EVA of Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange.

To scrutinize these hypotheses, the study conducted a comprehensive analysis, calculating the correlation coefficients between each profitability indicator and the EVA for the selected cohort of Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange. This examination allows for a more in-depth understanding of the relationships between these financial metrics and the EVA, shedding light on their potential impact and significance within the context of this study.

The four subsidiary hypotheses serve as vital building blocks for comprehensively exploring the intricate dynamics between profitability indicators and the EVA in this specific industrial sector, providing a foundation for a more nuanced understanding of the financial landscape.

Table 5. below presents this analysis, ranking the variables in descending order of their impact.

Dependent variable	Correlation coefficient (R)	Correlation coefficient (explained variance) (R^2)	Corrected correlation coefficient ($t(R^2)$)	Independent variables	Standard error of estimate	F value	P-value
EVA	0.543	0.295	0.291	ROA	1421842.828	69.391	0.000
	0.457	0.209	0.204	OPM	1505924.864	43.840	0.000
	0.415	0.173	0.168	GPM	1540078.228	34.636	0.000

	0.271	0.074	0.068	ROE	1629590.33	13.20	0.00
					5	0	0

The data presented in Table (5) reveals the influential impact of various financial indicators on EVA, shedding light on the dynamics within this study's context. Notably, the Return on Assets indicator emerges as a pivotal driver, exhibiting a significant correlation with EVA. The correlation coefficient, with an absolute value of (0.543), is statistically significant at the ($\alpha \leq 0.05$) significance level. This robust correlation underscores a positive linear relationship, indicating that an increase in the Return on Assets indicator is associated with a subsequent increase in EVA. The coefficient of determination (R^2), at 0.295, elucidates that the Return on Assets indicator elucidates approximately 29.5% of the variation in EVA. The F-value, a notable 69.391, stands as statistically significant at the ($\alpha \leq 0.05$) level, affirming the hypothesis that the Return on Assets indicator indeed exerts a statistically significant impact on the EVA of Jordanian pharmaceutical and chemical companies listed on the Amman Stock Exchange.

Likewise, as depicted in the same Table (5), the Operating Profit Margin indicator also emerges as a substantial contributor to EVA. With an absolute correlation coefficient of (0.457), and statistical significance at the ($\alpha \leq 0.05$) level, it underscores a positive linear relationship between these variables. This suggests that an increase in the Operating Profit Margin indicator corresponds to an elevation in the EVA for the industrial companies listed on the Amman Stock Exchange. The coefficient of determination (R^2), quantifying at 0.209, signifies that the Operating Profit Margin elucidates about 20.9% of the variance in EVA. The F-value, a compelling 43.840, is statistically significant at the ($\alpha \leq 0.05$) level, reinforcing the hypothesis that the Operating Profit Margin indicator holds a statistically significant effect on EVA.

Furthermore, the data within Table (5) demonstrates the substantial influence of the Gross Profit Margin indicator on EVA. The absolute correlation coefficient, recorded at (0.415), retains statistical significance at the ($\alpha \leq 0.05$) level. This correlation signifies a positive linear relationship between the Gross Profit Margin indicator and EVA, suggesting that an increase in the Gross Profit Margin indicator results in an amplified EVA for the industrial companies listed on the Amman Stock Exchange. The coefficient of determination (R^2), measuring at 0.173, indicates that the Gross Profit Margin accounts for approximately 17.3% of the variation in EVA. The F-value, reaching 34.636, stands as statistically significant at the ($\alpha \leq 0.05$) level, thereby reinforcing the hypothesis that the Gross Profit Margin indicator indeed holds a statistically significant effect on the EVA.

Lastly, the same Table (5) illuminates the positive relationship between the Return on Equity indicator and EVA. The absolute correlation coefficient, registering at (0.271), maintains statistical significance at the ($\alpha \leq 0.05$) level. This correlation implies that an increase in the Return on Equity indicator corresponds to an enhanced EVA for the industrial companies listed on the Amman Stock Exchange. The coefficient of determination (R^2), standing at 0.074, indicates that the Return on Equity clarifies roughly 7.4% of the variance in EVA. The F-value, standing at 13.200, remains statistically significant at the ($\alpha \leq 0.05$) level, thus reinforcing the hypothesis that the Return on Equity indicator holds a statistically significant effect on the EVA.

5. Discussion

The results of this study have significant implications for multiple stakeholders interested in the financial performance of pharmaceutical and chemical companies listed on the Amman Stock Exchange. Primarily, the management teams and investors in these companies will benefit from the findings showing the capability of profitability indicators like ROA, OPM, GPM, and ROE to explain changes in EVA.

For management teams, the results indicate the importance of boosting operational efficiency and profit margins to increase EVA and shareholder wealth over time. Specific strategies could involve increasing asset turnover to drive higher ROA, adjusting pricing approaches to improve gross margins,

or leveraging operating expenses to maximize operating profitability. Such efforts to refine cost and revenue management could have compounding effects on EVA. Additionally, investors can apply profitability analysis to make more informed decisions on buying, holding, or selling shares in Jordan's pharmaceutical and chemical companies. Rather than earnings per share alone, EVA provides a clearer picture of true economic profit considering the full cost of capital. As such, investors should emphasize return on assets, operating margins, and other productivity ratios when evaluating these companies. The results differ somewhat from Gerged et al., (2021), who found market-based measures like Tobin's Q better explained firm performance for chemical companies in Oman. However, this study's context of Jordan and focus on operational profitability rather than market valuation may account for the differing conclusions. Nonetheless, for stakeholders in Jordan's industrial corporations, the current findings highlight the substantial impacts profitability drivers can have on shareholder wealth.

At the organizational level, the collective and individual effects of ROA, OPM, GPM, and ROE on EVA changes will compel management teams to pursue new efficiencies in cost and revenue management. For example, increasing asset turnover could involve better utilization of production capacity through analysis of bottlenecks and constraints. Raising gross margins may require adjustments to pricing policies, volume discounts, or product mixes favoring higher-contribution offerings. Additionally, reducing operating costs as a percentage of revenues through scale efficiencies, automation, or other overhead management strategies can boost OPM to drive EVA gains. Such efforts can reduce expenses and improve profitability rates that directly feed into shareholder wealth via EVA.

Moreover, the predominance of ROA over other metrics in driving EVA reinforces the need to refine operations and asset management strategies. Management should continuously apply ratio analysis techniques to identify areas for improving ROA. For instance, improving inventory management, accounts receivable collection periods, or leverage policies could enhance asset turnover and ROA. This aligns with Dahiyat et al., (2021) who found efficiency ratios the leading predictors of firm failure for industrial companies in Jordan, further highlighting asset utilization and working capital management as crucial for performance. For investors, the confirmation that profitability indicators significantly impact EVA can inform valuation models and stock selection processes. Rather than simplistic earnings multiples, investors should emphasize return on assets, operating margins, gross margin, and other efficiency ratios that signal management's capability to generate true economic profits as manifested in EVA gains. This suggests a departure from prior research like Ball et al., (2020) that relied more heavily on earnings and book value measures in capital asset pricing models. The current study indicates investors in Jordan's pharmaceutical and chemical sectors should emphasize operating performance in their analyses, not just accounting results. Overall, by quantifying the relationships between key profitability ratios and changes in EVA, this study contributes unique empirical evidence for Jordan's industrial corporations and their stakeholders. The precedence of return on assets over other drivers indicates maximizing asset productivity should be management's primary focus for enhancing shareholder wealth.

Likewise, investors should prioritize operating efficiency ratios over traditional EPS multiples or book values when evaluating these companies. Such refined analyses can lead to improved strategic and financial decisions. While this study provides robust, actionable insights, future research could replicate the tests with larger, more diverse samples to improve generalizability. Additionally, exploring the specific factors influencing individual performance metrics could reveal further opportunities for operational enhancements driving EVA gains. Nonetheless, the current results offer vital conclusions for industrial companies in Jordan seeking to optimize financial and economic outcomes under mounting global competition.

6. Conclusion

The findings demonstrate that companies listed on the Amman Stock Exchange would benefit from adopting EVA alongside traditional performance metrics to evaluate financial performance. EVA

provides a clearer, more comprehensive indicator of changes in stakeholder and investor wealth than traditional metrics, with an economic rather than purely accounting perspective. The analysis shows profitability substantially influences EVA, underscoring its importance for stakeholders in evaluating company financial health and share value. These results suggest companies adopt EVA in internal investment decisions and incentive systems given its superior explanatory power of value creation. For shareholders, investors, and lenders, EVA better indicates returns on financial capital investments. As a process control, EVA can maximize shareholder, contributor, and lender wealth. The EVA approach surmounts traditional profit-centric performance evaluation by factoring financing costs and assessing value generation ability. EVA's rising prominence reflects its value explaining changes in shareholder, investor, and lender wealth through a company's total capital cost structure. It illuminates the drivers of corporate value creation capacity. EVA provides a fairer measure than accounting-based indicators of fluctuations in firm value and stock returns from an economic and market lens. In conclusion, Amman Stock Exchange-listed companies should implement EVA reporting alongside traditional metrics. The study recommends industrial corporations specifically highlight EVA methodology given stakeholders' vested interest in corporate financial health. Investors should incorporate EVA when evaluating buy and sell decisions. Moreover, adopting EVA for capital budgeting and incentive plans leverages its strengths explaining wealth creation from an economic perspective.

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