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Value of pharmaceuticals: Improving product demand through innovative research and development in Palestinian and Jordanian firms

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Abstract: This study investigates the sustainability of the pharmaceutical business in Palestine and Jordan by examining the impact of R&D intensity on company performance. The study sample consisted of pharmaceutical companies listed on the Amman and Palestine Stock Exchanges, where the descriptive analytical approach was used to achieve the study's objectives, which numbered (6) companies for ten years from 2013 to 2022. The study's dependent variable, "Performance and value of the company's Return on Assets (ROA), Earnings Per Share (EPS), and Tobin's Q, and the independent variables were R&D intensity (RDI) and selling and marketing expenses (SMI). A statistical analysis package (STATA) was used to achieve the study's objectives and test its hypotheses. The study analyzed the impact of variables (RDI, SMI,) on the performance and value of pharmaceutical companies. Variables (RDI, SMI, FS, CP, and LEV) had no significant influence on these factors. However, the MS has a significant impact on these factors. The study also found that while variables (SMI and FS) had a significant effect on pharmaceutical companies' performance and value, the variables (RDI, MS, CP, and LEV) had no significant influence on either. This study offers significant implications for the sustainability of pharmaceutical companies, investors, and academic research centers. Governments, including health ministries, should reevaluate R&D spending to bring about a qualitative change that will allow these businesses to innovate and sustainably contribute to the preservation of healthcare.

Keywords: *Financial performance, Firm value, Paper type– article, Pharmaceutical companies, R&D intensity, Selling and marketing expenses intensity, Sustainability.*

1. Introduction

Research and development are vital elements for ensuring the long-term viability of pharmaceutical companies. These firms may discover and develop innovative drugs and treatments that not only fulfill current medical needs, but also provide the foundation for future advancements in healthcare via research and development investments. The process of evaluating firm performance (FP) and firm value of institutions receives great attention from owners and depositors, as a set of financial indicators has been developed through which the volume of profits achieved and the risks that companies bear in order to achieve those profits can be measure [1]. Companies' financial statements have been used to create plans for the future, including the evaluation and analysis of the variables influencing the performance and value of financial institutions, which is of great importance to their management, shareholders, clients, and all stakeholders[2]. Moreover, evaluating the performance of institutions and determining their value are also considered important means for their continuity and growth. Establishing objectives that specify the institution's operations and provide guidance to staff to achieve them is necessary so that management can make the best choices[3]. It represents the fundamental backing of the diverse work that organizations undertake. It also helps to supply the organization with financial resources and investment opportunities in a range of performance areas[4].

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Research and development are a crucial tool for boosting an industry's business performance in the modern era of economics and for creating a significant competitive advantage[5]. Research and development intensity is essential for increasing a firm's value and performance[6]. By raising the caliber and appeal of their flagship products, high-growth companies have maintained their R&D expenditure. One major issue raised by scholars and practitioners in this setting is the effect of spending on R&D on the value and efficiency of firms[5]. Furthermore, there have been contradictory data regarding the correlation between R&D expenditure and a business's worth and success. Certain studies indicate that spending money on R&D can yield large future returns, increasing a company's worth[7]. According to a number of studies, firm value has a favorable relationship with R&D expenditures in research and development. The study[8] demonstrate how R&D expenditures increase a company's potential for profitability and, as a result, enhance its value. As for the study [9] provide evidence that the market values of American companies' R&D expenditures are higher than those of German and Japanese companies. Market value, production functions, and benefit functions are three techniques used to track the role of R&D intensity in businesses[10]. When valuing listed firms' stock, a rise in the companies' market value represents their long-term focused company's R&D expenditures. Therefore, R&D operations are one of the best ways to increase the achievements and valuation of a company [11]

In the modern business world, a company's marketing efforts are what really matter, both in terms of increasing shareholder returns and traditional performance characteristics. Similarly, marketing initiatives represent a long-term investment in a business that yields both direct and indirect financial and marketing returns[12]. Thus, these benefits contribute subtly to the explanation of market value. A product's distribution, sale, advertisement, and promotion are all classified as sales and marketing expenses if they are fully burdened and include allocable overhead associated with the aforementioned activities. All acceptable expenditures and costs (workers covered) are included in this description[13]. The association between selling and spending on marketing, company performance, and return on investment has also been the focus of extensive research and discussion for a number of years. Several researches have been conducted to determine this association. While researchers argue that selling and marketing costs have no bearing on a company's performance, others believe that a connection could exist that is either beneficial or detrimental. One could argue that Managers can use the possibility of existence to raise a company's market value[14] The pharmaceutical industry is one of Jordan's most significant and well-known sectors. Numerous factors, including improved patient care and health awareness, influence the Jordanian pharmaceutical market's size[15]. Jordan's pharmaceutical sector ranks third in the country's export list. Pharmaceutical companies in Jordan purchase pharmaceuticals, both developed and raw, from international markets such as China, India, and the US. Moreover, pharmaceutical companies in Jordan do not produce any drugs themselves; rather, 60% of their output comes from licensing, and 40% from foreign companies' franchising rights[15]. The therapeutic and medical supply sectors in Jordan produce 8% of the country's total industrial sector, contributing 4% to its gross domestic product. The sector employs 7 thousand Jordanians, with 35% female workers. The pharmaceutical sector, which accounts for 55% of the sector's production, exports products to over 80 foreign markets through 24 facilities, with an export volume of 692 million dinars in 2022.[16]

Compared to other manufacturing sectors, the pharmaceutical industry currently contributes very little to the Palestinian economy, as it relates to exports, employment, and production. Nonetheless, the pharmaceutical sector, which provides 38% of the medications used, is essential for satisfying the demands of the regional market. Socially, it also offers low-income customers an affordable, high-quality substitute for imported medication. As a result, it guarantees that medications are accessible to the neighborhood and improve overall population health[17]. There are many factories in Palestine's pharmaceutical sector. Even though some of these were founded over 30 years ago, the early 1980s saw a significant advancement in their production. The pharmaceutical industry is regarded as an emerging sector in terms of its size, technological sophistication, and scientific standing. The Palestinian pharmaceutical industry concentrates on creating medications that are identical to international brands,

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but are sold under different trade names. It is restricted to the formulation of pharmaceuticals, rather than the synthesis of active ingredients[18]. A $160 million industry, the pharmaceutical sector in Palestine produces low-cost pharmaceuticals for the market through companies like Pitjala Pharmaceuticals, Birzeit Pharmaceutical Company, and Al-Quds Pharmaceutical Company the Palestinian pharmaceutical industry, which covers 50% of the local market, employs over 1,000 people, 70% of whom hold specialized certificates. The industry has invested over 52 million dollars in modernizing manufacturing and infrastructure, contributing 60% of the local needs for medicines. The annual production volume is estimated at $50 million, with Palestinian companies producing 1,300 types of medicines registered with the Palestinian Ministry of Health. This sector is considered an essential source of medicine for the Ministry of Health. The sector employs over 1,300 direct jobs and thousands of indirect jobs, with shares of the three largest companies traded on the stock exchange[19].

Research has shown a positive relationship between R&D intensity and firm value, as various studies have suggested. However, some studies suggest a U-shaped relationship, with a positive relationship at one specific stage and a negative relationship at another. Other studies have found a negative relationship in the short term but a positive relationship in the long run. Market performance and industry trends influence the relationship between R&D and firm value.[20]

This research is significant in scientific research, creativity, and testing in Palestinian and Jordanian business environments, particularly pharmaceutical companies. Competition and technological progress have emphasized the need for firms to find new competitive advantages. R&D activity is vital for this sector, and it affects Palestinian and Jordanian societies. However, few Palestinian or Jordanian studies have tested the relationship between R&D, financial performance, and firm value. This study investigates the impact of R&D intensity on the short- and long-run performance of pharmaceutical companies listed in the Palestinian and Jordanian stock markets.

Using panel data methods and data from six companies registered with Bursa, the principal goal of this study is to test the effects of selling and marketing costs, in addition to the level of R&D activities, on performance and value for pharmaceutical corporations listed between 2013 and 2022 on exchanges for shares in Amman and Palestine. The coronavirus pandemic, financial leverage, firm size, and firm date of establishment are the control variables of this research. Tobin's Q, earnings per share, and return on assets are the factors that are dependent on this study. As this is the first study of its kind in Palestine that investigated, as best as the researcher could have known, the connection between the degree of R&D and expenses related to marketing and sales, which is regarded as an extension of earlier relevant studies and a reference for future studies examining the variables of this research. It is also anticipated that this research will represent an addition to Arab libraries in general, and Jordanian and Palestinian libraries in particular, as well as provide a reference for researchers and writers with a set of relevant data and reduce its limitations. The findings of this paper have several practical ramifications for policymakers who design firm support programs that finance R&D or offer knowledge services. Policymakers may consider a firm's degree of R&D activity or the extent to which it has established knowledge assets when choosing which firms will receive benefits. In line with the literature, the researcher hopes that this paper's findings will help show that an organization's marketing and selling expenses are correlated with its sector's value and efficacy. However, it should be remembered that new information or changes in the market could make the results of the analyses utilized in this study less or more reliable.

2. Literature Review

2.1. The R&D Intensity, FP and Firm Value

R&D intensity is typically determined by dividing R&D expenditure into sales for a business. Moreover, there are two types of R&D intensity: indirect and direct. In this case, R&D intensity is a measure of a firm's investment in fundamental and applied research to advance business performance is called R&D intensity[11]. It generally varies depending on the manufacturing, technology, product

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expertise, and industry sector of the company. Ultimately, two more objectives of R&D spending are to raise productivity and increase an organization's salable output[7]. Two of the most important metrics for tracking a company's value and performance are R&D intensity and expenditure[5]. where the proportion of a company's expenditure on R&D is known as "R&D intensity" to sales. Additionally, [21]established standard methods for measuring research intensity, which include the ratio of scientific staff to total staff or R&D spending/sales to improvements in metrics such as asset status, productivity, profits, and sales. Thus, R&D intensity measures the amount of money an organization invests in R&D projects to enhance equipment and production as well as industry and expertise in products[22]. In other words, the goal of R&D intensity is to leverage basic and applied research to enhance business performance and value[20].

It is imperative for companies to enhance their technical capabilities, production effectiveness, and service caliber. Consequently, it started to place a high value on R&D expenditure. However, given the recent slowdown in the global economy, several businesses are questioning the increase in R&D spending[23]. According to [24] argument, businesses should boost their research and development during a financial downturn or economic recession. Increasing R&D costs may cause sales growth and the market value of products and services to strengthen their comparative advantages, even though they may also temporarily impair a firm's performance. Operating circumstances that can impact a firm's R&D and company performance consist of size, capital organization, and external flexible elements such as the competitive setting and the state of the economy. This demonstrates that development and research efforts have a significant influence on the economic achievement of a business. In addition,[22] discovered that the earnings rate and profit measure from ongoing activities are both affected by R&D activities. Her research demonstrates the significance of giving R&D intensity as a top priority for businesses looking to grow in value.

There was no discernible link between R&D and company productivity, conferring to a paper by [25]regarding 258 US business inventions and financial details. Their study, [26]examine non-financial firms listed between 1990 and 2013 on the U.S. Stock Exchange. The outcomes of funding R&D can contribute to the gradual progress of fresh competencies and expertise, offering them a performance and knowledge edge over competitors. However, temporarily, it has a detrimental effect; this suggests that corporate value and the strength of R&D are positively associated, whereas an unfavorable association between R&D intensity and business performance is found. According to[22], companies can become more profitable if they have a properly balanced R&D intensity and product innovation development portfolio strategy. Additionally, to look into the connection amid R&D and technologically advanced Chinese companies' marketability and business performance [27]performed a regression analysis. They found that R&D investment and human capital are the two main drivers of profitability and that they both significantly and favorably affect a company's marketability. However, when they looked at how R&D intensity affected current profitability, [28]determined that the level of R&D had an important effect on the efficiency of all factors, an indicator of the general success of a business. A study [29] used nonlinear techniques to examine the real impact of R&D operations on company results.

Studies by [30, 31]., [32] looked at the linking within R&D and how firms performed in relation to the advantages of R&D either currently or in years to come. It was shown that there is an adverse relationship between present and future performance. Conversely, research by [7] and [33]suggest that the connection among R&D and company value is U-shaped, meaning that there is a positive relationship between the two at some stages and a negative relationship with others. Alternatively, [34]study of this relationship revealed that it had a negative short-term relationship; however, it was a fruitful long-term partnership. This hypothesis was recognized after prior dialogue.

H_0 There is a statistically significant positive effect of the R&D intensity on FP and value in pharmaceutical companies listed on Amman and Palestine.

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2.2. The Selling and Marketing Expenses Intensity and FP and Value

Maximizing shareholders' present value is one of the main goals of company managers. In this context, it is crucial to remember that companies aim for high market value for their company, not just profit, which is achieved through sales revenue[35]. In this case, company value is a projection of future value, which is primarily built on the firm's marketing initiatives[11]. Selling and marketing expense intensity are recognized as elements that adversely impact an organization's effectiveness and worth in brief. However, in the long run, this increases the value. The costs associated with selling and marketing include the cost of promotional activities and any tools or instruments required to assist with marketing and sales efforts. They also include the salaries of all staff members involved in sales and marketing[33]. In addition, the costs associated with expansion initiatives are included in sales and marketing (S&M) expenses. The objective of this expense is to expand swiftly and recover the initial outlay made to bring a new client. in contrast to conventional businesses[12].

For an extended period, there has been a great deal of discourse and investigation regarding the link between marketing and selling expenses and the worth and efficiency of the organization[14]. Several studies have been conducted to ascertain the existence of this relationship. While some researchers argue that selling and marketing costs have no bearing on a company's performance, others speculate that the relationship might be favorable or unfavorable. It can be further contended that leaders have the power to raise a company's worth. by taking advantage of their existence [36]

A study [37] found that marketing initiatives increase a firm's market value. Conversely, by analyzing the correlations between selected variables, [38] argued that high levels of selling and marketing expense intensity significantly lower firm value. However, a Study [39]discovered a strong positive correlation between a few selling and marketing variables, which helps explain the degree of marketing activity and the market-to-book ratio. Furthermore, using the portfolio approach, [40]unable to discover any connection between selling and marketing costs, and firm value. In addition, [41]emphasize a negative association between selling and marketing expense intensity and a company's stock price. The assertion made by [13]asserted that selling and marketing costs have the potential to differentiate products and increase a company's worth. Similarly,[42] suggest that costs related to marketing and sales improve a firm's worth and can be seen as a possible source of additional revenue. This hypothesis was confirmed after prior conversations:

H_2: There is a statistically significant positive effect of the selling and marketing expenses intensity on the FP and value in pharmaceutical companies listed on Amman and Palestine Stock Exchange.

3. Methodology

3.1. Firms Selection

The pharmaceutical firms traded in the Palestine and Amman stock markets comprise the research sample. The aim of the study was to use a descriptive analytical approach. These companies numbered (6) provided that financial reports and information were available for these companies.

3.2. Data Collection

The final number of observations for the ten years of the study was (60), after counting the number of observations over time and removing missing data. Data for the current study, which thoroughly evaluated the yearly reports about businesses that appeared for ten years, from 2013 to 2022, were gathered and analyzed using the content analysis technique. It uses a statistical analysis package (STATA) to accomplish the research objectives and evaluate the hypotheses.

3.3. Variables

3.3.1. Dependent Variables

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The study's dependent variable, "Performance and value of companies," is determined by utilizing (ROA), (EPS), and Tobin's Q. see Table 1.

Table 1.
Dependent variables measurement.

Variables	Symbol	Measurement
Return on assets	ROA	Calculated by splitting total assets by net profit.
Earnings per share	EPS	Calculated by dividing the total number of common shares issued by the net profit after taxes, interest, and preferred stock payments are subtracted.
Tobin's Q	TQ	Computed by $(Total\ Assets + Market\ Value\ of\ Equity - Book\ Value\ of\ Equity)\ Total\ Asset.$

3.3.2. Independent Variable

This study measures the independent variables (R&D intensity, selling, and marketing expenses). (Table 2).

Table 2.
Independent variables measurement.

Variables	Symbol	Measurement
R&D intensity	RDI	Proportion of R&D spending to overall income.
Selling and marketing expenses intensity	SMI	Proportion of selling and administrative costs to total net sales

3.3.3. Control Variables

The firm parameters (firm size, leverage, market share, and coronavirus pandemic) were selected as control factors to limit the impact of independent variables and are listed in Table 3.

Table 3.
Description of control variables.

Variables	Symbol	Measurement
Firm size	FS	Calculating by the logarithm of total assets
leverage	Lev	Total debt / Total assets.
Market share	MS	Market share is computed by dividing the company's sales during that time period by the total sales of the industry during that same time frame.
Corona pandemic	CP	Is a dummy variable that equals 1 for the period after March 2020 and 0 otherwise?

3.3.4 Regression Model Analysis

To determine the impact of R&D intensity and selling and marketing expense intensity on FP and the value of pharmaceutical firms listed on Amman and Palestine, the following study model was examined using multiple regression analysis:

$$P\&V_{it} = \beta_0 + \beta_1 RDI_{it} + \beta_2\ SMI_{it} + \beta_3 FS_{it} + \beta_4 CP_{it} + \beta_5 LEV_{it} + \beta_6 MS_{it}$$

From the above-mentioned regression equation three models were developed as follows:

$$\textbf{Model 1-}ROA_{it} = \beta_0 + \beta_1 RDI_{it} + \beta_2\ SMI_{it} + \beta_3 FS_{it} + \beta_4 CP_{it} + \beta_5 LEV_{it} + \beta_6 MS_{it}$$

$$Model\ 2\text{-}EPS_{it} = \beta_0 + \beta_1 RDI_{it} + \beta_2\ SMI_{it} + \beta_3 FS_{it} + \beta_4 CP_{it} + \beta_5 LEV_{it} + \beta_6 MS_{it}$$

$$Model\ 3\text{-}TOBINS_{it} = \beta_0 + \beta_1 RDI_{it} + \beta_2\ SMI_{it} + \beta_3 FS_{it} + \beta_4 CP_{it} + \beta_5 LEV_{it} + \beta_6 MS_{it}$$

Where:

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$P\&V_{it}$ = Performance and value of the company (ROA, EPS, and Tobin's Q).
β0 = Regression equation constant.
RDI = R&D intensity.
SMI = Selling and marketing expenses intensity ratio.
Controls = Firm size, leverage, Market share and Corona pandemic.

4. Results

4.1. Summary of Descriptive Statistics

The descriptive statistics are presented in Tables No. (4). The data were characterized using standard descriptive statistics, which include the minimum and maximum values, as well as the mean and standard deviation for numerical variables.

Table 4.
Descriptive statistics.

Variable	Obs.	Mean	Std. dev.	Min.	Max.
SMI	60	0.16	0.098	0.027	0.483
RDI	60	0.026	0.014	0.008	0.111
Firm size	60	7.548	0.381	6.678	8.09
LEV	60	0.259	0.124	0.104	0.686
MS	60	0.16	0.117	0.034	0.467
CP	60	0.673	0.474	0	1
TOBINS Q	60	1.166	0.295	0.696	1.845
ROA	55	0.414	0.049	0.32	0.575
EPS	60	0.622	0.207	0	1.395

Table 4 shows the findings of the descriptive analysis of the study's dependent, independents, variables, and control variables. Therefore, based on the above table (4), all variables consist of (60) observations.

4.2. Normality Test

The normality statement in the regression assumes that prediction errors follow a normal distribution. Several tests can be employed to verify this assumption, including the skewness–kurtosis test, Shapiro-Wilk test, Shapiro-Francia test, QQ plot of residuals, and Bera-Jarque statistics[43]. This study used skewness and kurtosis. This test evaluates whether the sample is derived from a population that follows a normal distribution. The outcomes in Table No. (5) indicates a p-value of 0.000 in the two models (EPR and TOBINS Q), below (0.05), signifying that the normality hypothesis is not satisfied[44] indicates that if the number of observations exceeds (30), the normal distribution is not considered a problem with the regression equation and can be ignored. The number of observations in this study reached (60) observations.

Table 5.
Normality test.

Model No.1 ROA						
Variable	**Obs.**	**Pr(Skewness**	**Pr(Kurtosis)**	**Adj.**	**Chi2(2)**	**Prob>Chi2**

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residual	55	0.739	0.495	0.590	0.744	0.8736
Model No.2 EPS						
residual	60	0.000	0.000	23.150	0.000	0.0001
Model No.3 TOBINS Q						
residual	60	0.008	0.370	7.050	0.029	0.0060

4.3. VIF and Tolerance Test

The Variance Inflation Factor (VIF) was calculated to measure the presence of multicollinearity. A VIF coefficient exceeding (10) suggests the existence of multi-collinearity[45]. Where the Table 6 outcomes indicate a mean VIF of (2.852,3.011, 3.011) significantly less than the threshold of ten in Model No.1 (ROA), Model No.2 (EPS), and Model No.3 (TOBINS Q); additionally, the individual variables' VIFs are relatively small, supporting the earlier assumption that the three models' explanatory variables do not exhibit substantial correlation.

Table 6.
VIF and tolerance test.

Model 1 ROA	VIF	1/VIF	Model 2EPS	VIF	1/VIF	Model 3 TOBINS Q	VIF	1/VIF
MS	5.463	0.183	MS	6.088	0.164	MS	6.088	0.164
FS	5.228	0.191	FS	5.602	0.179	FS	5.602	0.179
SMI	2.416	0.414	SMI	2.48	0.403	SMI	2.48	0.403
RDI	1.942	0.515	RDI	1.91	0.524	RDI	1.91	0.524
LEV	1.626	0.615	LEV	1.869	0.535	LEV	1.869	0.535
CP	1.204	0.83	CP	1.142	0.876	CP	1.142	0.876

4.4. Hausman Test

This study provides the option of two-panel estimator approaches: random effects models (REM) and fixed effects models (FEM), because it uses panel data analysis[46]. To determine whether the individual effects were fixed or random, as shown in Table No. (7), a Hausman specification test is performed. The values of the Chi-Square Statistics in Model No.1 (ROA), Model No. 2 (EPS), and Model No. 3 (TOBINS Q) are (4.595), (3.928), and (4.636), respectively, with P-values of (.597), (.686), and (.057) respectively, according to the Hausman Test results in Table 7. Because the value of (P) in all models are more than (5%), using the random effects model is the best option.

Table 7.
Hausman test.

		Coef.		Coef.		Coef.
Chi-square test value		4.595		3.928		4.636
P-value	Model 1	0.597	Model 2	0.686	Model 3	0.057

4.5. Regression Results Random Conclusion

To test the study hypotheses and ascertain the impact of the independent variables (R&D intensity and selling and marketing expense intensity) on the dependent variable (Financial Performance and Firm Value), a test was conducted to estimate the parameters of the Random Effect model in Tables 8,9,10. The outcomes were as follows:

Table 8.
Regression results random for model No.1 (ROA).

ROA	Coef.	St.err.	t-value	p-value	[95% Conf.	Interval]

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RDI	0.477	0.412	1.16	0.246	-0.33	1.285
SMI	-0.105	0.068	-1.55	0.122	-0.238	0.028
FS	-0.039	0.026	-1.53	0.127	-0.089	0.011
CP	0.019	0.01	1.89	0.059*	-0.001	0.038
LEV	-0.138	0.044	-3.14	0.002***	-0.224	-0.052
MS	0.086	0.085	1.01	0.314	-0.081	0.253
Constant	0.507	0.183	2.77	0.006***	0.148	0.867
Mean dependent var		0.176		SD dependent var		0.036
Overall r-squared		0.333		Number of obs.		55
Chi-square		23.449		Prob > chi2		0.001
R-squared within		0.165		R-squared between		0.600

Note: *** p<.01, ** p<.05, * p<.1.

Table 8 shows the linear regression results for model 1 that the variables Included in the multiple linear regression model explain (33.3%) of the differences in the performance and value of the pharmaceutical companies. The regression analysis in model 1 findings also show that the variables (RDI, SMI, FS, and MS) have no statistically significant influence on the performance and value of the pharmaceutical companies, while the variables (CP and LEV) have a statistically significant impact on the performance and value of the pharmaceutical companies.

Table 9.
Regression results Random for model No.2 (EPS).

ROA	Coef.	St. err.	t-value	p-value	[95% Conf.	Interval]
RDI	-0.846	2.28	-0.37	0.711	-5.315	3.624
SMI	-0.219	0.375	-0.58	0.559	-0.953	0.515
FS	-0.12	0.139	-0.86	0.388	-0.391	0.152
CP	-0.052	0.054	-0.96	0.335	-0.156	0.053
LEV	-0.052	0.054	-0.96	0.34	-0.159	0.056
MS	-0.949	0.209	-4.53	0.000***	-1.369	-0.529
Constant	1.743	0.984	1.77	0.076	-0.186	3.672
Mean dependent var		0.622		SD dependent var		0.207
Overall r-squared		0.351		Number of obs		60
Chi-square		28.071		Prob > chi2		0.000
R-squared within		0.135		R-squared between		0.950

Note: *** p<.01, ** p<.05, * p<.1.

Table 9 shows the linear regression results for model 2, that the variables Included in the multiple linear regression model explain (35.1%) of the differences in the performance and value of the pharmaceutical companies. The regression analysis in model 2 findings also shows that the variables (RDI, SMI, FS, CP, and LEV) have no statistically significant influence on the value and performance of the pharmaceutical firms. In contrast, the variable (MS) has a statistically significant influence on the performance and value of the pharmaceutical companies.

Table 10.
Regression results Random for model No.3 (TOBINS Q).

TOBINS Q	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]
RDI	1.627	3.356	0.48	0.628	-4.951	8.204

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SMI	-0.938	0.551	-1.70	0.089*	-2.018	0.142
FS	-0.396	0.204	-1.94	0.052*	-0.796	0.004
CP	0.094	0.079	1.19	0.233	-0.06	0.248
LEV	-0.426	0.308	-1.38	0.167	-1.03	0.178
MS	0.057	0.691	0.08	0.934	-1.298	1.412
Constant	3.962	1.448	2.74	0.006***	1.123	6.8
Mean dependent var		1.166		SD dependent var		0.295
Overall r-squared		0.306		Number of obs.		60
Chi-square		22.951		Prob > chi2		0.002
R-squared within		0.093		R-squared between		0.768

Note: *** $p<.01$, ** $p<.05$, * $p<.1$.

Table 10 shows the linear regression results for model 3, that the variables Included in the multiple linear regression model explain (30.6%) of the differences in the performance and value of the pharmaceutical firms. The regression analysis in model 3 findings also show that the variables (RDI, MS, CP, and LEV) have no statistically significant effect on the value and performance of the pharmaceutical firms, while the variables (SMI and FS) have a statistically significant impact on the performance and value of the pharmaceutical companies.

5. Discussion

The outcomes of Tables 8,9,10 provide insights into the impact between performance and several other variables of pharmaceutical companies. The adjusted R square of 30.6%, 35.1%, and 33.3% indicate that these models explain a significant portion of the variance, with each model providing different insights.

Model 3 highlighted that both CP and LEV have a significant impact on the performance and value of pharmaceutical firms; these results are in consistent with previous literature on various industries, including pharmaceuticals [47] the pandemic has introduced challenges but also opportunities for growth of the pharmaceutical sector, due to the high demand of its products [48]Also, the significance of LEV could indicate the ability of firms to utilize debt to enhance operational capacity, aligning with [49], who emphasized the role of capital structure on firm performance.

Model 2 shows the significance of MS. These outcomes highlight the role of market positioning and competition in the pharmaceutical sector. Great market share is linked to the benefits of the economic scale, which leads to better performance [50]

In Model 3, SMI and FS have a statistical impact. This aligns with the notion that larger firms, with a greater resource base, are better able to invest in marketing strategies and have more share, which affects profitability [51].Highly competitive industries' ability to effectively market products can be a key determinant of their success [52]

6. Conclusion

This study analyzes whether selling and marketing expense intensity and R&D intensity impact the FP and value of pharmaceutical firms traded on stock markets in Palestine and Amman, totaling six companies. Three companies are listed on the ASE and three on the PEX from 2013 to 2022. After the data in the article were analyzed, it became clear that (ROA, EPS, and Tobin's Q) contributed significantly to explaining the impact that the ratio of selling to marketing expenses and the intensity of R&D had on FP and firm value. The variable ROA explained the extent of this effect by (33.3%), while the variable EPS explained the study hypotheses by (35.1%), and the variable Tobin's Q explained the study hypotheses by (30.6%). This study's data analysis for (ROA) showed that the variables (RDI, SMI, FS, and MS) have no statistically significant effect on the FP and value of pharmaceutical companies. In contrast, the variables (CP and LEV) have a statistically significant influence on the value and

performance of pharmaceutical firms. The analyses for (EPS) showed that the variables (RDI, SMI, FS, CP, and LEV) have no statistically significant effect on the value and performance of pharmaceutical firms. In contrast, the variable (MS) has a statistically significant influence on the FP and value of pharmaceutical companies. In addition, the analysis in model No.3 (TOBINS Q) shows that the variables (RDI, MS, CP, and LEV) have no statistically significant impact on FP and value. while the variables (SMI and FS) possess a statistically significant effect on pharmaceutical FP.

R&D spending can help pharmaceutical businesses advance and innovate by creating jobs, stimulating collaboration with academic institutions and research groups, and boosting their economic development. Furthermore, by emphasizing innovation value and R&D intensity in Palestinian and Jordanian business environments, specifically in the pharmaceutical sector, the corpus of academic literature is increased by this work. Beyond this scholarly contribution, the data demonstrate how financial performance and firm value are affected by the accounting handling of R&D intensity as period expenses. Based on these findings, it is advised that businesses in the majority of Palestinian and Jordanian sectors disclose more information about their R&D expenses in their financial statements. In this case, this will help researchers to perform more precise research and obtain solid results for these relationships. Businesses should also be careful when selecting selling and marketing expenditure strategies to increase profits by prolonging the firm's life cycle. Overall, pharmaceutical businesses must conduct research and development to remain sustainable, relevant, and impactful in a rapidly changing healthcare sector.

Jordanian and Palestinian pharmaceutical companies collaborate on R&D expenses to innovate new products and produce patents in the pharmaceutical industry, ensuring sustainability in providing pharmaceutical services. Jordanian and Palestinian pharmaceutical companies cooperate with local and regional universities in R&D expenses to innovate new products to produce patents and reduce R&D expenses. Pharmaceutical companies in Palestine must separate research, development, sales, and marketing expenses in their financial statements to benefit researchers, investors, government departments, and stakeholders.

The study's limitations include a limited sample size, a 10-year time lag, and a focus on the pharmaceutical industry. These constraints may provide different outcomes in other industries or with other sample sizes. However, these restrictions may present chances for additional study in the future. Prospective research endeavors may delve into alternative industrial domains with more substantial sample sizes, scrutinize the variables that interact with research and development endeavors and enterprise efficacy, and juxtapose the companies in Palestine and Jordan with those in other developing countries. Furthermore, future research may employ a variety of approaches.

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