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Covid-19 Impact on NASDAQ Pharmaceutical Companies' Financial Performance. And it's effects on Intellectual Capital.

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ABSTRACT :

This study investigates the impact of Intellectual Capital (IC) on the financial performance, specifically Return on Equity (ROE), of pharmaceutical companies listed on NASDAQ from 2019 to 2023. A purposive sampling method was applied to select 8 companies, yielding 40 observations. The study used quantitative data, with analysis techniques including classic assumption tests, simple linear regression, F-test, and t-test, all conducted using SPSS 25. The findings indicate no significant relationship between IC and ROE in the selected pharmaceutical companies. This suggests that other factors may exert a greater influence on financial performance. Future research is needed to explore these factors and further examine their impact on the pharmaceutical sector.

Introduction:

The COVID-19 pandemic severely impacted the global economy, including the pharmaceutical sector. During the week of February 24-28, 2020, global stock markets lost US$6 trillion in value, and the U.S. economy shrank by 3.4% in 2020, worse than initial estimates. However, pharmaceutical trade grew by 8.4% in 2020, even as overall global trade declined by 7.8%. As the pandemic unfolded, pharmaceutical companies played a critical role in developing vaccines, treatments, and diagnostic tools. This placed the industry in the global spotlight. For pharmaceutical companies, particularly those listed on NASDAQ, assessing financial performance through metrics like Return on Equity (ROE) is essential. ROE measures profitability relative to shareholder investment, which is crucial in an industry heavily reliant on research and development (R&D) to build intellectual capital (IC)—including scientific knowledge, patents, and trademarks.

The relationship between IC and ROE is important, as effective use of intellectual capital can drive financial performance. This study examines how the pandemic affected the IC and ROE of pharmaceutical firms, considering both the challenges, such as disrupted supply chains, and the opportunities, like increased R&D investments in response to rising demand for COVID-19-related treatments and vaccines.

Review of Literature:

- Welly et al., 2023 examine the significant impact of Intellectual Capital (IC) on the financial performance of pharmaceutical companies. They emphasize the importance of managing and utilizing IC resources effectively to establish competitive advantages, drive profitability, and navigate industry challenges. The study contributes valuable insights on how pharmaceutical companies can improve their financial outcomes by leveraging intellectual capital.
- Abhay, Singh, et al., 2023 explore the connection between intellectual capital and financial performance, particularly focusing on Return on Assets (ROA) in pharmaceutical companies listed on the BSE and NSE. Using unit root tests and regression analysis, the study finds that "structural capital," "value-added capital," and "human capital" have a significant impact on ROA. The authors suggest that pharmaceutical companies should strategically invest in and manage their intellectual capital to enhance financial performance.
- Anggun, Amalia, Sigit, et al., 2022 investigate the influence of intellectual capital on firm value in high-IC companies, testing financial performance as an intervening variable. While the study indicates that IC affects the financial performance of healthcare companies, it does not specifically address pharmaceutical firms or ROE. The findings suggest that IC impacts financial performance, but does not mediate the relationship between IC and company value in the healthcare industry.
- Shahid, Ali, Ghulam, et al., 2022 focus on the impact of intellectual capital on financial performance in non-financial firms across Pakistan and India from 2010 to 2020. They conclude that IC has a positive effect on financial performance, with human capital efficiency (HCE), structural capital efficiency (SCE), and customer capital efficiency (CEE) showing a positive influence. However, the study does not specifically analyze pharmaceutical companies or ROE.

- Mohammad, Bujang, et al., 2018 contribute to the literature by focusing on measuring intellectual capital using the VAIC (Value Added Intellectual Coefficient) model and calculator. The paper addresses challenges firms face when quantifying IC and offers practical solutions. It also provides an extensive review of literature on the relationship between IC, market value, and financial performance, shedding light on how intellectual capital influences financial outcomes.
- Variyetmi, Wira, Yenida, et al., 2023 investigate the impact of intellectual capital and managerial ability on financial performance in infrastructure, utilities, and transportation sectors in Indonesia. Analyzing data from 30 companies between 2017 and 2020, the study finds that variables like IC added value, IC disclosure, and managerial ability do not significantly affect financial performance, measured by indicators such as ROA, ROE, and net profit margin.

Statement of Problem :

To assess the Effect of IC on Financial Performance of a Company using one of the Profitability Ratio "ROE"

Research Objective:

1. Study the Impact of COVID-19 on both IC and ROE of the Pharmaceutical Companies.
2. Assess the relationship between IC and how Management & Utilization of IC influence the financial performance of the companies (using ROE)

Research Hypothesis:

- H_0: IC has no significant effect on financial performance.
- H_1 = IC has a significant effect on financial performance.

Research Methodology:

This study uses a quantitative approach research method, aims to explain and examine the effect of IC on financial performance. The research was carried out using secondary data in the form of annual financial reports of pharmaceutical companies listed on NASDAQ for the 2019-2023
This study uses the *dependent variable (Y) financial performance and the independent variable (X) Intellectual Capital*. Following Formula is referred for Computation.

Intellectual Capital (IC) Calⁿ
IC in this study was measured using the VAIC method developed by (Pulic, 1998) with three components, namely:
a. Value Added Capital Employed (VACA)
VACA is a comparison between value added (VA) and company equity (CE). VACA shows the level of IC on the utilization of CE / capital available in the company to increase the company's VA.
VACA = VA / CE [VA = OP + EC + D + A]
b. Value Added Human Capital (VAHU)
VAHU shows the contribution made by each rupiah invested in Human Capital/HC (employee expenses, including salaries and benefits) to the organization's VA. The relationship between VA and HC indicates the ability of HC to create value for the company. VAHU is an indicator of the quality of the company's human resources.
VAHU = VA / HC
c. Structure Capital Value Added (STVA)
STVA measures the amount of Structural Capital (SC) to produce 1 rupiah from VA and is an indication of how successful SC is in value creation.
STVA = SC / VA [SC = VA / HC]
Therefore, VAIC calculation formulation is: VAIC = VACA + VAHU + STVA
VAIC indicates the intellectual capability of the organization. (Welly, Y., Zainal, A., Silalahi, M.U., & Sianipar, M.Y. (2023), et al)

2.Financial Performance
This study uses profitability with the Return On Equity (ROE) indicator with the formula:
ROE = Earnings After Tax/Total Equity

Data Collection Techniques:

Secondary Data was opted for the study due to its Nature. Data was extracted from NASDAQ and Official Websites of the Companies. The Sample for the study was conducted via Purposive Sampling and Data Availability for the period of 5 Years ranging from (2019-2023), for the Study Annual Data was extracted and not Quarterly Data (Some data was missing for computation, so annual data was chosen)
The simple linear regression equation that can be used in this study is as follows.
Y = a + bx with: Y = Financial Performance a = Constant Value b = Regression Coefficient of Independent Variables X = Intellectual Capital

Limitations:

- Variable Selection: The study contains only IC as an independent variable in it. Further research on supplementary significant variables could broaden the knowledge base on determinants of financial performance.
- Data Source: The study makes an assumption on the authenticity and consistency of the data source. Any limitations or biases present in the dataset could reduce the reliability of the outcomes.
- External Validity: Generalizing the results concerning pharmaceutical companies listed on NASDAQ across the entire industry could be limited. Consideration of industry-specific factors is a must to promote external validity.

ANALYSIS & INTERPRETATION:

Descriptives

Descriptive Statistics output shows a considerable variability in the both of the variables. ROE(money) varies from 0 to 18386 with an average of 470.92 and a very high standard deviation of 2905.28. Information Coefficient (IC) varies in the very narrower limits (-59.03 to 59.27) with a smaller standard deviation (8.33) and hence, less extreme values compared to the ROE.

Normality Test:

In addition to this, the distributional features of the ROE and IC were also examined with the nonparametric Kolmogorov-Smirnov tests. The tests were very significant ($p < .001$) for both IC and ROE, demonstrating that the distributions of these variables are very non-normal.

Regression Analysis (ANOVA):

A regression analysis was conducted to analyze the relationship between the ROE and the IC. Nevertheless, the overall model failed to reach the statistical significance ($F(1, 38) = 0.078$, $p = .782$), and thus, IC was found to have no statistically significant role in the prediction of the ROE. In addition, the R-squared value which is the proportion of variance explained by the model was very low (0.002). This implies that the model accounts for only a little variation in the ROE.

Tables & Figures:

Table 1: Sample Population Size – 8 Listed Pharmaceuticals Companies.

Return on Equity of Pharmaceutical Companies for the period (2019-2023)

Year	GSK	AZN	PFE	BIIB	NVS	JNJ	Torrent Pharm	WockPharma
2019	14.24	18.1	14.24	0	6.81	0.01	14.86	0.17
2020	14.99	19.81	14.99	0.2	1.39	0.15	18.32	10.73
2021	20.79	20.45	20.79	2.96	2.93	0	18386	12.26
2022	21.38	12.04	21.38	0.01	0.53	0.16	15.32	3.23
2023	19.45	16.86	19.45	0.83	13.32	2.26	16.28	2.32

Table 2: Descriptive Statistics

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
IC	40	8.326428187154283	19.412066509277185	-59.029308755760380	59.272898211599525
ROE	40	470.916500000000000	2905.280506514134700	.000000000000000	18386.000000000000000

Table 3: One-Sample KM Normality Test

One-Sample Kolmogorov-Smirnov Test

		ROE	IC
N		40	40
Normal Parameters[a,b]	Mean	470.916499999999800	8.326428187154287
	Std. Deviation	2905.280506514134700	19.412066509277185
Most Extreme Differences	Absolute	.531	.347
	Positive	.531	.347
	Negative	-.436	-.333
Test Statistic		.531	.347
Asymp. Sig. (2-tailed)		.000[c]	.000[c]

Table 4: Regression Analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-1.825E-17	.160		.000	1.000
	IC	-.045	.162	-.045	-.278	.782

a. Dependent Variable: ROE

Conclusion:

The aim of this study is to investigate the correlation between Intellectual Capital and the Return on (ROE) among the pharmaceutical companies listed on the NASDAQ. This was examined through a set of many analyses. The descriptive statistics of both ROE and IC were the first step of the analysis. The results showed a wide range of values for both variables, suggesting that there is a considerable range of values for both ROE and also IC across the pharmaceutical companies in the sample. Then, the non-parametric tests were conducted to evaluate the distribution of ROE and also IC. While the results showed that both variables did not have normal distributions, it implies that they do not have a standard bell curve. To investigate more closely the correlation between IC and ROE, the correlation analyses were carried out to see the correlation between IC and ROE. The regression models comprised ANOVA and also some tests for heteroskedasticity. The outcomes of the regression analyses proved that the IC did not have any significant effect on the ROE. Furthermore, the diagnoses of the heteroskedasticity indicated that there was no evidence of the heteroskedasticity in the regression model. Thus, the variance of the residuals or the differences between the forecasted and actual ROE values is constant at various levels of IC. The Durbin-Watson test was also conducted to check for the serial correlation in the residuals. This test showed no significant autocorrelation, indicating that the residuals are not uncorrelated as well as not independent. The results of this test showed no significant autocorrelation, indicating that the residuals are independent and not correlated with each other. Therefore, Null Hypothesis is Accepted. In conclusion, These results suggest that other factors, beyond IC, may have a stronger influence on the financial performance of these companies. Further research is needed to explore these factors and their relationship with financial performance in the pharmaceutical industry.

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