DEPARTMENT OF PUBLIC POLICY & GOVERNANCE DPPG
B. K. SCHOOL OF PROFESSIONAL & MANAGEMENT STUDIES | GUJARAT UNIVERSITY
International Journal of Management, Public Policy and Research
International, Peer Reviewed journal
E-ISSN: 2583-3014

IMPACT OF KEY FINANCIAL INDICATORS ON SUSTAINABLE GROWTH IN INDIAN PHARMACEUTICALS: A COMPARATIVE PRE- AND POST-COVID STUDY

Mr. Sagar Saini, Dr. Shefali Dani

Research scholar,
GLS university, Opp. Law Garden,
Ellisbridge, Ahmedabad – 380006.
Gujarat.
Email : sagaesaini1571@gmal.com

Research Guide,
Dean, Bachelor of Business Administration,
GLS university, Opp. Law Garden,
Ellisbridge, Ahmedabad – 380006.
Gujarat.
Email : Shefali.dani@glsuniversity.ac.in

ABSTRACT

In this research, authors analyze the interaction of the main financial indicators Net Profit Ratio (NPR), EBITDA, Return on Capital Employed (ROCE) and Return on Net Worth (RONW)) to the Sustainable Growth Rate (SGR) of Indian pharmaceutical firms and compare the results between the pre-COVID (20152019) and post-COVID (20202024) period. The main goal will be to determine the way the importance and influence of these financial variables of sustainable growth developed in accordance to macroeconomic disturbance. Based on a strong sample of publicly traded pharmaceutical corporations, the analysis makes use of Pearson correlation and multi-regression to figure out solid connection and causal influence between them amid the two periods. The results demonstrate that before the advent of the COVID-19 pandemic, a prevalence of drivers based on the returns existed and the only material predictor of SGR was RONW. The model itself, however, still in the post-COVID market, names only a single positive significant factor, and this is the indicator NPR, whereas the indicator EBITDA appears surprisingly to have a great negative influence on the SGR, reflecting the strategic switch of the focus between capital efficiency and profitability-oriented growth in an economic turmoil. The general regression models of the two periods show excellent explanatory values (R 2 > 90 %) and hence support the hypothesis that financial metrics are relevant in the prediction of Green growth. These leads to the rejection of the null hypothesis which means it has been proved that there is in existence financial indicator that has a significant and context-dependent role to play on SGR. The research has critical implications on financial managers, investors, and policy-makers in that financial solutions should only be adaptive, period-specific, and according to the future economic realities and resilience-based growth goals.

Keywords: Sustainable Growth Rate (SGR); Net Profit Ratio (NPR); Return on Capital Employed (ROCE); Return on Net Worth (RONW); EBITDA; Financial Performance; COVID-19 Impact; Capital Efficiency.

INTRODUCTION

Pharmaceutical is not just a pillar of Public health in the world but also a significant factor in economic development and long-term growth in countries along with job creation and innovativeness (PwC, 2020). Within the backdrop of the emerging economies such as India, the industry has developed into a global center of production of generic drugs, biosimilars and vaccine manufacturing. But what matters is that long-term sustainable growth has to be experienced and attained by a firm operating in this dynamic industry. One important performance indicator, which is considered a backward indicator but has as of now been adopted as a key indicator in terms of long-term strategic viability, is Sustainable Growth Rate (SGR), and it signifies how a firm can experience a growth without intruding into its financial status (Higgins, 1977; Chandra, 2011).

The commonly used conventional financial indicators include the Net Profit Ratio (NPR), EBITDA, Return on Capital Employed (ROCE), Return on Net worth (RONW) among others to gauge the performance of the firm. The metrics are not only metrics of profitability but also the efficiency of a firm but they can also be predictors of the ability of the firm to maintain growth in the long-term (Damodaran, 2021; Narayana swamy, 2014). But what really happens to the indicators on SGR specifically in the seasons of external shock is one that has not been well examined in terms of academic and practical research.

The development of the COVID-19 pandemic introduced the unprecedented disruption of the global economy, accompanied by the rippling effects into the sectors (IMF, 2021). The paradoxical situation occurred in the pharmaceutical industry: on the one hand, it had to meet the greater number of demands in drugs, vaccines, and medical equipment; on the other hand, it was overwhelmed with the higher input costs, lack of labor, and disruption of global supply chains (EY, 2021; McKinsey & Company, 2021). Such conditions provide a distinct offering through which it can be tested whether the conventional financial engine of SGR were relying on or changing considerably due to the crisis.

This research will analyze the trend in data of the chosen Indian pharmaceutical enterprises in terms of Rupees NPR, EBITDA, ROCE, and RONW of the financial performance of the companies before and after the COVID-19 outbreak in order to determine the impact of the above measures on sustainable growth. It is not only to measure the relationship, but to gain an insight on how the pandemic might have changed the fundamental financial aspects of growth. This information is crucial to corporate strategists, policy-makers, and investors that are retooling risk and performance standards in the new world that we live in post pandemic (World Bank, 2022; ICRA, 2023).

LITERATURE REVIEW

Sustainable Growth Rate (SGR) has proved to be an important financial indicator that shows a capacity of a firm to grow without an efficacy demanding pressure that the capital structure may not be able to endure. Higgins (1977) writes in his seminal work to define the SGR as the highest rate at which a company may increase its growth rate and still maintain its present financial policy. This rate reflects the internal capability to fund on the part of the firm in the form of their retained earnings and the ability to operate efficiently. The role of SGR is, in fact, magnified in the case of highly dynamically changing areas of activity, such as pharmaceuticals, especially within the market frameworks which require innovations as well as fiscal strength.

Researchers have over the years examined various variables that occur in the SGR. Amongst the same, the Net Profit Ratio (NPR) stands out as one of the major drivers that have always been cited as a direct measure of the fundamental profitability of a firm. The higher NPR usually means a higher retained earnings that allows the company to grow self-financed (Brigham & Daves, 2021). The EBITDA, which indicates the operational efficiency of a firm prior to the effects of financing and accounting-based choices, has also been determined to be correlated to internal funds ability and readiness to invest (Damodaran, 2021). Research like those of Palepu and Healy (2013) has established how operational margins (EBITDA) are becoming consistently more useful in helping investors and other analysts gauge sustainability of growth.

Other indices that are notable in the literature are Return on Capital Employed (ROCE) and Return on Net Worth (RONW). ROCE displays the efficiency with which a business employs its capital to make profits and therefore ROCE is used as a proxy of long term performance and strategic allocation (Ross, Westerfield & Jaffe, 2020). In the meantime, the RONW as the shareholders of equity see things is useful in knowing how well reinvested earnings are being utilized (Narayana swamy, 2014). The two ratios are important in determining how a capital structure of a firm can help in the achievement of its growth goals without being over-dependent on the external capital (Chandra, 2011).

Indian pharmaceutical market valued at a market size of $50 billion (IBEF, 2023) has been characterized by a fast-growth as evoked by exports, government policy and escalating healthcare needs. Financial structure of the industry is analyzed in several studies, however, most of them are more oriented on profitability and development of the industry than on financial sustainability of the industry. As an example, Mehta and Bhattacharya (2019) analyzed the factors of profitability of Indian pharma companies and do not directly associate them with sustainable development. On the same note, Joshi and Sahoo (2020) examined a pattern of capital structure without advancing

to relate it with the ability of firms to grow over time.
This situation changed greatly when the COVID-19 pandemic broke out in 2020. Not only has the global healthcare crisis led to new needs in the consumption of pharmaceutical goods, but also highlighted the structural weakness of the supply chains, inputs costs, and R&D cycles (EY, 2021). World Bank (2022) observed that the world experienced temporary increase in the income of pharmaceuticals suppliers during the pandemic but this was sometimes matched by a decrease in margins because of increased costs. Some companies thrived as they shifted their strategies towards the development and sale of vaccines but others are not in the position to maintain their previous profits and investments.
Such dynamics also highlights the necessity to take another look at the issue of the interdependence between classic financial measures and sustainable growth in the face of altering market conditions. According to McKinsey & Company (2021), the pandemic resulted in a major change in the way pharma companies planned capital efficiency, cost control and reinvestments. Similarly, Deloitte (2022) study identified businesses that have a high level of financial resilience, not short-term profitability to have better chances to survive and rebound in the healthcare sector during the COVID-19 crisis.

LITERATURE GAPS

Although the literature base contributes vastly to the individual influence of profitability and efficiency indicators as factors that determine the financial results of the corporation, a significant gap in the integrated approach to linking the variables to the Sustainable Growth Rates (SGR) in the pharmaceutical industry is observed. Linear inquiry of, most often, metrics such as the Net Profit Ratio (e.g., Mehta and Bhattacharya, 2019), ROCE (Joshi and Sahoo, 2020), or RONW (Joshi and Sahoo, 2020) has been studied in a single Portugal, without seeking further answers to more enlightening questions, such as long-term sustainability of growth.
Moreover, despite its theoretical bases in retained earnings and inner capital efficiency (Higgins, 1977), there is a dearth of findings, which aim to prove that SGR is related to various financial indicators, especially in industry-specified environments such as the pharmaceutical industry. More importantly, there are hardly any studies that provide a comparative analysis of financial determinants of SGR under various macroeconomic conditions, i.e., pre and post the occurrence of a global shocking event like the COVID-19 pandemic. The absence of the temporal comparison has caused a great gap in the knowledge of the way external shocks impact the effect internal financial measures have on the sustainability with which companies can expand.
Secondly, most of the existing literature is based on developed economies or world averages whereas emerging economies such as India and their industry specific dynamics of policy environments and financial ecosystems are also underrepresented on the same front. Therefore, more eminently, it seems that an India oriented, sector specific, time oriented research is required that investigates the influences of key financial performance measures of the SGR in the pharmaceutical companies in various economic cycles.

RESEARCH OBJECTIVES

On the basis of the identified gaps in the existing literature, the following objectives are followed in the present study:

1. To analyze the correlation between the most important financial ratios (NPR, EBITDA, ROCE and RONW) and Sustainable Growth Rate (SGR) of a sample of Indian pharmaceutical Groups.
2. To compare and evaluate the influence financial indicators on SGR at the stage of pre-COVID period (2015 2019) and the stage of the post-COVID period (2020 2024).
3. To determine whether the importance and weight of financial determinants of SGR have changed because of the economic disturbances related to COVID-19-pandemic.
4. To provide insights on the nature of the sector of interest to investors, corporate managers, and policymakers on possible ways of promoting sustainable growth in the pharmaceutical industry going into the time of financial uncertainty and resurgence.

Hypotheses Formulation

Main Hypothesis (H_0): There is no significant impact of key financial indicators (NPR, EBITDA, ROCE, and RONW) on the Sustainable Growth Rate (SGR) of pharmaceutical companies before and after COVID-19.

Research Methodology

The research design that the present paper will follow will be quantitative, comparative, and explanatory, wherein an attempt will be made to determine the extent to which the following financial ratios Net Profit Ratio (NPR),

EBITDA, Return on Capital Employed (ROCE), and Return on Net Worth (RONW) influence the Sustainable Growth Rate (SGR) model (designated as SGR- P RAT in this study) among the Indian pharmaceutical firms. It will be about the assessment of the effect of these financial factors on SGR both separately and simultaneously with the help of correlation and multiple regression analysis. The research is presented over two different periods: before the COVID (20152019) and after the COVID (20202024), and it is possible to make a comparison of the financial performance of the company under normal economic conditions and a crisis situation.
The sample includes the listed Indian pharmaceutical companies selected on the market capitalisation basis, with the selection being made on the conditions of availability of the consistent financial data, relevance in the market, and the scale of activities. Companies having full and entirely dependable financial releases throughout the period of research were used to ascertain analytical soundness. The sources of secondary data have used reliable and valid financial databases like CMIE prowess and the annual report of companies. The Sustainable Growth Rate (SGR) - PRAT model is taken as the dependent variable of the study, and the independent ones are NPR, EBITDA, ROCE, and RONW as a set of the variables that holistically represent profitability, efficiency, and the returns of capital.
In the pursuit of the research objectives, the study uses a two-stage analysis. The first is the Pearson correlation analysis, which is used to determine the strengths and direction of relations among the variables. Lastly, regression analysis is performed to know the extent to which each of the financial indicators have impact on SGR. Statistical computations are done on SPSS software which is the tool of solid computation of the results and clear inference.
It is within this methodological framework that the study could not be content with the superficial relationships and seek the causal links between firm financial outputs and sustainable growth. Through these relationships in the backdrop of a rapid global disruption such as the case of COVID-19, the study can give significant information to corporate decision-makers, investors, and policy-makers who would like to improve financial resilience and sustainable performance of the pharmaceutical sector.

DATA ANALYSIS AND INTERPRETATION

Table 1. Correlations analysis of SGR, NPR, ROCE, RONW, EBITDA of Pre-COVID period (2015-2019)

		BNPR	BROCE	BEBITDA	BRONW	BSGR
BNPR	Pearson Correlation	1	.897**	.873**	.861**	.858**
	Sig. (2-tailed)		.000	.001	.001	.001
	N	10	10	10	10	10
BROCE	Pearson Correlation	.897**	1	.874**	.907**	.868**
	Sig. (2-tailed)	.000		.001	.000	.001
	N	10	10	10	10	10
BEBITDA	Pearson Correlation	.873**	.874**	1	.745*	.694*
	Sig. (2-tailed)	.001	.001		.014	.026
	N	10	10	10	10	10
BRONW	Pearson Correlation	.861**	.907**	.745*	1	.985**
	Sig. (2-tailed)	.001	.000	.014		.000
	N	10	10	10	10	10
BSGR	Pearson Correlation	.858**	.868**	.694*	.985**	1
	Sig. (2-tailed)	.001	.001	.026	.000	
	N	10	10	10	10	10

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Analysis and Interpretation of Correlation Matrix (Pre-COVID: 2015–2019) : Table 1 contains the Pearson correlation coefficients between Sustainable Growth Rate (SGR) and Net Profit Ratio (NPR), Return on Capital Employed (ROCE), Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA), Return on Net Worth (RONW) during the period prior to COVID in the ring of 2015 to 2019. The correlation coefficients shed some light on the direction and strength of association between variables using a measure of linear relationships, whereby the statistical significance will be tested at both the 0.01 and the 0.05 level (2- tailed).
In the analysis, there exist an acceptable and significant correlation between RONW and SGR ($r = 0.985$, $p < 0.01$). It means that the sustainable growth rates were higher in the former companies with a higher level of returns on net worth even in the pre-COVID part of the research. This result indicates that the sustainable growth in Indian

pharmaceutical companies between these two periods was chiefly because of positive use of equity providers shareholders and this was perhaps as a result of internal capital reinvestment plans and effective management of profitability.

In the same way, ROCE has a positive relationship with a very significant emphasis on the SGR ($r = 0.868$, $p < 0.01$) which means that more efficient firm in utilizing its total capital base was more likely to have a better sustainable growth. This strengthens the observation that capital productivity had been a big factor of internal capacity of growth in non-pandemic times.

There is also a high positive correlation of NPR and EBITDA with SGR although to a slightly lesser degree as compared to RONW and ROCE. The correlation coefficient between NPR is 0.858 ($p < 0.01$) and correlation coefficient of EBITDA is 0.694 ($p < 0.05$). These findings imply that better profitability levels (in terms of NPR), in addition to superior operating earnings levels (measured in terms of EBITDA), help drive stronger growth potential: yet, their contribution toward this effect might be slightly weaker than those of its return-oriented counterparts.

Among the independent variables, high intercorrelations are found i.e. NPR and ROCE ($r = 0.897$, $p < 0.01$) and ROCE and RONW ($r = 0.907$, $p < 0.01$). This is important to note as such financial indicators not only have a significant effect on SGR but, they are also strongly correlated. It could be indicative of a fundamental monetary rationality between profit performance and capital efficiency, as well as performance of returns before the COVID era in the pharma market.

Their clear and statistically high correlations (0.694-0.985) confirm that the sustainable growth of the pharmaceutical industry prior to the COVID-19 was strongly coupled with financial health of the firms internally, especially, returns and profitability regarding capital. Such findings reinforce empirical findings in various existing financial theory such as the sustainable growth model of Higgins (1977) which argues on the emphasizing nature of the return on equities and profit margins to inspire the internally stable growth trend.

Table 2. Correlations analysis of SGR, NPR, ROCE, RONW, EBITDA of post-COVID period (2020-2024)

		ASGR	ANPR	AROCE	AEBITDA	ARONW
ASGR	Pearson Correlation	1	.747*	.711*	.315	.812**
	Sig. (2-tailed)		.013	.021	.376	.004
	N	10	10	10	10	10
ANPR	Pearson Correlation	.747*	1	.735*	.765*	.664*
	Sig. (2-tailed)	.013		.016	.010	.036
	N	10	10	10	10	10
AROCE	Pearson Correlation	.711*	.735*	1	.729*	.920**
	Sig. (2-tailed)	.021	.016		.017	.000
	N	10	10	10	10	10
AEBITDA	Pearson Correlation	.315	.765*	.729*	1	.535
	Sig. (2-tailed)	.376	.010	.017		.111
	N	10	10	10	10	10
ARONW	Pearson Correlation	.812**	.664*	.920**	.535	1
	Sig. (2-tailed)	.004	.036	.000	.111	
	N	10	10	10	10	10

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Analysis and Interpretation of Correlation Matrix (Post-COVID: 2020–2024): Table 2 gives the Pearson correlation coefficients between the main financial indicators such as, Net Profit Ratio (ANPR), Return on Capital Employed (AROCE), Earnings Before Interest, Taxes, Depreciation, and Amortization (AEBITDA), Return on Net Worth (ARONW), and the Sustainable Growth Rate (ASGR) in a post-COVID period (20202024). It seeks to determine the changes in association of these financial indicators and SGR after the COVID-19 pandemic.

The findings indicate a moderate and a strongly positive relationship between SGR and the majority of the variables, not as firm as it was before the COVID, however. The strongest correlation draws between SGR and RONW ($r = 0.812$, $p < 0.01$), which states the fact that even after the pandemic, the more pronounced the returns on shareholders basis, the more likely the better levels of sustainable growth will be recorded. This implies that equity efficiency remained a major engine of growth to pharmaceutical companies even in the recovery phase.

Net Profit Ratio ($r = 0.747$, $p < 0.05$) and ROCE ($r = 0.711$, $p < 0.05$) also had strong positive relationships with SGR and this showed that profitability and capital productivity remains important even now. The implications of these findings are that firms that had been able to maintain high profit margins and maximize the use of their capital to survive in the turbulent post-COVID market conditions were in better standing to continue the growth. The strength of NPR and ROCE as positive growth drivers in both the periods supports their resilience as financial growth drivers.

But in the post-COVID era, a coefficient between EBITDA and SGR shows that it is statistically insignificant ($r = 0.315$, $p = 0.376$). It is a significant change with the pre-COVID time when EBITDA was shown to have a statistically significant positive effect. The lesser value of EBITDA can be a sign that the operating profits were no longer adequate to facilitate growth in the ambiguous, post-pandemic recovery process, perhaps as the input costs increased, the demand became more volatile, and the risks of investment decreased the efficiency of the operating earnings.

Among the independent variables themselves, a great deal of tangling is maintained. It is worth noting here that there is a very strong correlation between ROCE and RONW ($r = 0.920$, $p < 0.01$), which indicates that performance of the capital employed and shareholders equity had similarly close relationships in gauging financial efficiency at this stage. Moderate to strong-positive correlations are also seen between NPR and other indicators such as EBITDA ($r = 0.765$, $p < 0.05$) and ROCE ($r = 0.735$, $p < 0.05$), which reveal that there is continued interdependence among measures of profitability as well as returns.

Altogether, the post-COVID correlation engagement can be interpreted as indicating a rather weakened yet considerable financial structure that leads to the environment of essential growth in the Indian pharmaceutical companies. Although RONW, NPR, and ROCE still have a heavy weight on performance, the EBITDA position has become less powerful, indicating that operations will be growing in the long run based on performances regarding returns instead of just operating profits. The change might indicate some strategic moves companies made in addressing the pandemic like the control of capital and a restructuring of debts and cut backs in costs in forms that would affect operations-based measures differently than measures of returns.

Comparative Analysis: Pre- and Post-COVID Correlation Trends

Conducting a comparative analysis of the correlation outcomes in the pre- and post-COVID experience, a certain change in the financial drivers of a sustainable presence can be observed, affecting the Indian pharmaceutical industry. All four financial indicators, namely, NPR, EBITDA, ROCE, and RONW illustrate a high level of statistical significance positive correlation with SGR (all correlations had probabilities above 0.65), suggesting a closely interconnected financial structure in which all three indicators of the financial position of profitability, operational efficiency, and the rates of returns were the primary determinants of sustainable growth. Specifically, RONW ($r = 0.985$) and ROCE ($r = 0.868$) were found to be overriding drivers with other indicators, such as NPR and EBITDA, also recording a high correlation with the two.

Nonetheless, during the post-COVID era (20202024), the effects of RONW ($r = 0.812$), NPR ($r = 0.747$), and ROCE ($r = 0.711$) on the SGR continued to significantly differ, but the strength of the correlation was slightly weaker, which indicates certain loss in their effectiveness during the turmoil of the economy. It is worth noticing that the correlation between EBITDA and SGR reduced to a non-significant level ($r = 0.315$), indicating one of the essential structural changes. This deterioration means that the operational profitability was not a reliable indicator of growth in turbulent post-COVID environment, probably because of, pressure on costs, changed demand patterns and inconclusiveness in the decision making related to reinvestments. Also, the correlation pattern of the independent variables indicated that there was a change in interdependencies, with the strong relationship between ROCE and RONW ($r = 0.920$) found during the post-COVID period, indicating a change in the order of capital returns priorities.

All in all, the comparative analysis shows that although both return-based measurements (RONW and ROCE) continued to be crucial to the growth performance in both periods, post-COVID profit margin-based and operational measurements such as EBITDA lost the predictive power. Such changes emphasize the significance of financial strength, capital productivity, and shareholder wealth generation as fundamental elements of sustainable development in the pharmaceutical sector, though in particular, during the times of macroeconomic unpredictability.

Table 3. Regression analysis of Impact BRONW, BEBITDA, BNPR, BROCE on BSGR in Pre- COVID period (2015-2019)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.991[a]	.981	.966	.01303

a. Predictors: (Constant), BRONW, BEBITDA, BNPR, BROCE

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.044	4	.011	65.338	.000[b]
	Residual	.001	5	.000		
	Total	.045	9			

a. Dependent Variable: BSGR

b. Predictors: (Constant), BRONW, BEBITDA, BNPR, BROCE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.004	.020		-.205	.845
	BNPR	.196	.139	.234	1.408	.218
	BROCE	-.001	.002	-.127	-.613	.567
	BEBITDA	-.001	.001	-.152	-1.016	.356
	BRONW	.009	.001	1.011	6.213	.002

a. Dependent Variable: BSGR

Analysis of Multiple Regression (Pre-COVID: 2015 2019): Table 3 presents analysis of regression to determine the joint and individual effect of major financial drivers including Net Profit Ratio (BNPR), Return on Capital Employed (BROCE), EBITDA (BEBITDA), and Return on Net Worth (BRONW) on Sustainable Growth Rate (BSGR) of Indian pharmaceutical firms in the pre-COVID years (2015 2019).

Model Summary

The R value that is exhibited in the Model Summary is quite high and equals 0.991, which indicates that the relationship between the dependent variable and the independent variable is extremely strong. R Square of 0.981 indicates that the four financial predictors account for the 98.1 percent of the fluctuation in SGR, confirming that the model has a powerful explanatory capacity. The measure of reliability of the model is further reinforced by the value of the Adjusted R Square which is 0.966 which considers the degrees of freedom and the complexity of the model. The standard error of the estimate is even very low at 0.01303 implying that the prediction error is low and the model is accurate.

ANOVA Table

ANOVA table validates the statistical significance of the general model, F- statistic = 65.338, and p-value = 0.000 which is very significant at the 1% value. This makes the conclusion that the mixture of financial variables applied in the model are a significant indicator of changes in SGR and the regression equation itself is coherent and of value, overall.

Coefficients Table

The coefficients table shares information on how each of the independent variables contributes towards SGR individually. Of the predictors, Return on Net Worth (BRONW) is the only one which also has significant influential positive contribution to BSGR (beta = 1.011, t, = 6.213, p = 0.002). This implies that a one unit (unit) rise in RONW will cause a significant positive change in the Sustainable Growth Rate, everything held constant. This observation matches the concept of financial theory, which says that a shareholder equity efficiency is useful in sustainable growth financed internally (Higgins, 1977; Damodaran, 2021)

On the other hand, the coefficients of Net Profit Ratio (BNPR), EBITDA (BEBITDA) and ROCE (BROCE) are insignificant in the said model at 0.218, 0.356 and 0.567 respectively. Even though BNPR shows positive coefficient (B = 0.196) marking a desirable direction, it is not significant at 5 percent level. Both the coefficients of BROCE and BEBITDA are negative but not significant enough to reflect small inefficiencies in the model,or duplication effects of the variable RONW.

Table 4. Regression analysis of Impact of ARONW, AEBITDA, ANPR, AROCE on ASGR in Post- COVID period (2020-2024)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.958[a]	.918	.852	.02268

a. Predictors: (Constant), ARONW, AEBITDA, ANPR, AROCE

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.029	4	.007	13.997	.006[b]
	Residual	.003	5	.001		
	Total	.031	9			

a. Dependent Variable: ASGR

b. Predictors: (Constant), ARONW, AEBITDA, ANPR, AROCE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.008	.042		-.179	.865
	ANPR	.938	.246	.861	3.820	.012
	AROCE	.002	.006	.186	.395	.709
	AEBITDA	-.006	.002	-.723	-2.789	.038
	ARONW	.006	.005	.456	1.154	.301

a. Dependent Variable: ASGR

Multiple Regression Analysis Interpretation (Post-COVID: 2020-2024): Table 4 reports the result of a multiple regression analysis that wanted to understand the effect of four major financial indicators- Net Profit Ratio (ANPR), Return on Capital Employed (AROCE), EBITDA (AEBITDA) and Return on Net Worth (ARONW) on Sustainable Growth Rate (ASGR) of the Indian pharmaceutical companies in the post COVID period (2020-2024).

Model Summary

The Model Summary indicates that the correlation coefficient (R = 0.958) is high and this indicates that there is a great linear association between the independent variables and SGR. The R Square value is 0.918, meaning that, the model explains the variances (or variation) observed in SGR to almost 91.8 percent of it, confirming a very good fit. The value of Adjusted R Square 0.852 indicates a strong statistic indicating that despite the limitation that the number of predictors may have in the model, the model still explains a lot. The value of the Standard Error of the Estimate (0.02268) is also small, convincing the accuracy of the model in the prediction of SGR.

ANOVA Table

The presented ANOVA outcome leads to the statistical significance of the model, where F-statistic is 13.997 and p-value is 0.006, which is significant at the level of 1%. This means that the combination of independent variables has statistically significant portion of the variance in ASGR. Therefore, the regression in general is good to infer.

Coefficients Table

The table of the coefficients gives information as to the individual detail of each financial predictor:

It is found that the significance of the only variable (Net Profit Ratio-ANPR) on ASGR is positive (B = 0.938, beta = 0.861, t = 3.820, p = 0.012). Such an outcome indicates that profitability was a major driving force of sustainable growth in a post-COVID environment, which may be explained by an increased significance of net income to leverage escalating operation-related risks and expenses.

- A negative statistical significant relationship with ASGR (B = -0.006, 2 = -0.723, t = - 2.789, p = 0.038) with EBITDA (AEBITDA) emerges surprisingly. It is quite a significant difference as compared to its favorable pre-COVID role, which means that operating earnings could have lost its value as a source of growth funding after COVID. The adverse effect may be brought about by aberrations in operating cost, diminished margins or inefficiency of capital in the economic state of perturbation and restoration.

The Return on Capital Employed (AROCE) and the Return on Net Worth (ARONW) which are conceptually important are also found out to be statistically insignificant during this period (p-values = 0.709 and 0.301 respectively). Their coefficients point to positive contributions though they are not statistically important. This can be an indication of the short-term destabilization in the efficiency of capital in the post-COVID recovery or a possible combination with ANPR.

Altogether, the relative results emphasize the notion that, although the measure of return (RONW and ROCE) were imperative to maintaining the growth during the two periods, profit margin-based and operating parameters such as EBITDA lost their predictive capacity after COVID. Such changes confirm the significance of financial strength, capital management and shareholder value development as the main aspects of sustainable growth in the pharmaceutical sector in times of macroeconomic uncertainty.

Comparative Summary of Regression Results: Pre-COVID v/s Post-COVID

When comparing the regression models applied in the pre- and post-COVID times, one would notice an apparent change in the financial dynamics that impact Sustainable Growth Rate (SGR) in the Indian pharmaceutical sector. Overall, the model had an extremely strong explanatory capacity in the pre-COVID period (20152019) with the R 2 = 0.981, showing that 98.1 percent of the differences in SGR were attributed to the four independent components, which were: Net Profit Ratio (NPR), ROCE, EBITDA and RONW. Out of these, the single predictor that was statistically significant (p = 0.002) was RONW, which had a strong positive effect, indicating once again that the major determinant of sustainable growth in an otherwise stable economic period was shareholder return efficiency. The other predictors: NPR, ROCE and the EBITDA are not significant at individual impact, but they all are positively related to the probability.

Conversely, the regression model after COVID (2020 2024) indicated a modesty smaller albeit still enormous R 2 value of 0.918 which lies in the significance of having a high predictive power. But the dynamics behind it were different in a significant way. Our most remarkable discovery was in the sense that Net Profit Ratio (ANPR) came out as the lone significant positive contributor to the SGR (P = 0.012) and the largest standardized beta (861), implying that profitability turned out to be the most important factor of sustainable growth in the post-pandemic era. Surprisingly, the EBITDA had a statistically significant negative impact (p = 0.038) on SGR which meant that

the operating profit was no longer a good measure of translating to internal growth. This perversion can indicate greater operating volatility, greater cost loads and reinvestment efficiency after the pandemic.
Moreover, ROCE and RONW ceased to be predictive of the post-COVID model, which indicates a possible drop in the topicality of capital efficiency measures when economic conditions are not very clear. This shift implies that pharmaceutical companies, albeit being dependent on the capital productivity and efficiency of equity previously, needed to switch to the maximization of profitability and bottom line earnings preservation to maintain the growth in the current environment of broken supply chains, shifted healthcare priorities, and disrupted cash flows.
To conclude, regression results identify a shift in the financial background of sustainable growth, involving the use of the profitability approach as a driver after COVID and the use of the return-based measures prior to COVID. Such understandings are critical towards investors, financial managers, and policymakers who intend to formulate sustainable development resilient strategies across the pharmaceutical industry during turbulent times.

FINAL CONCLUSION

In the study, the relationship between key financial performance measures of Net Profit Ratio (NPR), EBITDA, Return on Capital Employed (ROCE) and Return on Net Worth (RONW) and Sustainable Growth Rate (SGR) of Indian pharmaceutical companies before/after COVID was investigated. With the help of correlation and multiple regression analyses, it was the purpose of the study to see whether and to what extent these financial metrics had an effect on sustainable growth in both the periods.
The empirical results indicated that the change in the financial motif of a sustainable growth was high before and after the pandemic. RONW has been found as the only statistically significant predictor of SGR pre-COVID, which means that, in stable market conditions, the shareholder equity efficiency was the most significant factor that contributed to the growth. Since the model accounted for 98.1 percent of the change in SGR, it had good explanatory power. Conversely, in the after-COVID, NPR is the only determinant having substantial effect, and EBITDA was regarded as having a significant negative effect. This change reflects the change in the growth strategies, where companies depend more on net profitability and earnings retention as economic uncertainty grows, whereas in the past there was the traditional focus on capital efficiency measures such as ROCE and RONW, which grew increasingly irrelevant.
At that, regarding these findings, the study succeeds in rejecting the null hypothesis (H 0) according to which there is no significant influence of key financial indicators (NPR, EBITDA, ROCE, and RONW) on SGR before and after COVID-19. There was at least one financial variable that had a statistically significant influence on SGR in each period and justifies the notion that financial performance measures can indeed have a significant and dynamic role in shaping the development of sustainable growth in the pharmaceutical industry.
In general, the paper has come to a conclusion that the financial determinants of sustainable Growth are vulnerable to macroeconomic disturbances. Although return-based metrics were prevailing during the stability stage pre-COVID, profitability metrics prevailed during the recovery stage post-COVID. These insights have serious implications on corporate financial planners, investors, and policymakers to have adaptive financial strategies, where they prioritize various levers of growth relying on external conditions.

MANAGERIAL IMPLICATIONS

The findings of this paper have a number of important implications on financial managers, strategic planners, and executive leadership in the pharmaceutical sector, especially on approaching growth in the ever-changing economic conditions that the COVID-19 pandemic has created.

1. Focus on profitability during uncertain times as opposed to capital efficiency.

The post-COVID results indicate that Net Profit Ratio (NPR) was the parameter with the highest positive influence on Sustainable Growth Rate (SGR), but conventional indicators such as ROCE and RONW had no meaning. This is an indication that in case of disruptive economics, managers ought to apply cost control, pricing policies and maximization of margin in order to maintain growth, instead of depending only on efficiency of capital deployment.

2. Rethink Operational Plans in regard to EBITDA

The adverse and substantial effect of EBITDA on SGR in the post-COVID era alludes to the fact that the operating profits are not being able to convert into long-term growth in an effective manner. Managers need to evaluate the use of the operating cash flows - whether inefficiencies, excessive cost, reinvestment risks are hindering sustainable growth, and adjust the operational structures to bring it in line with the objectives of the business.

3. Enhance Equity Return Use in the Periods of Stability

During the pre-COVID period, Return on Net Worth (RONW) played a major role in driving SGR, which emphasizes the importance of optimizing use of shareholder capital. Strategies reinvesting of retained earnings, dividend optimization, and performance-based capital allocation, are ROE-enhancing, and managers should pay attention to these strategies during stable or high-growth times.

4. Come up with Period Specific Growth Models

Indeed, the research-work identifies that the effect of financial parameters on growth is dynamic. As such, managers are not supposed to have a one-size policy regarding growth strategies. Rather, they ought to personalize financial planning, risk management models according to the economic business cycle- stressing profitability in times of crisis and efficiency of returns in times of recovery or boom period.

5. Improve financially predictive models with enlivened signs

Since they have high explanatory powers, the regression models may be incorporated in the financial forecasting tools by the pharmaceutical companies with SGR being their main focus. This will assist in the prediction of growth patterns in a better way and adapt to the changing macro-financial situations.

6. Investor Relation and Capital Structure

The investors are becoming more concerned with sustainable and strong development. The results indicate that reporting strategies defined by profitability and stability position, respectively, can be used to sustain investor confidence when communicating unfavorable conditions created by uncertainty and favorable conditions created by stability. Managers should also look into the aspect of restructuring capital to balance between equity and debt as a way of long term sustainable growth.

REFERENCES

[1] Brigham, E. F., & Daves, P. R. (2021). *Intermediate financial management*. Cengage Learning.
[2] Chandra, P. (2011). *Financial management* (8th ed.). Tata McGraw-Hill.
[3] Damodaran, A. (2021). *Applied corporate finance* (4th ed.). Wiley.
[4] Damodaran, A. (2021). *Corporate finance: Theory and practice*. Wiley.
[5] Deloitte. (2022). *Global life sciences outlook: Resilience in the face of uncertainty*. https://www2.deloitte.com/
[6] Ernst & Young (EY). (2021). *Beyond COVID-19: Pharma's long-term outlook*. https://www.ey.com/
[7] Ernst & Young (EY). (2021). *Rebuilding pharma's future post-COVID-19*. https://www.ey.com/
[8] Higgins, R. C. (1977). How much growth can a firm afford? *Financial Management, 6*(3), 7–16. https://doi.org/10.2307/3665251
[9] India Brand Equity Foundation (IBEF). (2023). *Pharmaceutical industry report*. https://www.ibef.org/
[10] ICRA. (2023). *Sector update: Indian pharmaceutical industry outlook*. https://www.icra.in/
[11] International Monetary Fund (IMF). (2021). *World economic outlook: Recovery during a pandemic*. https://www.imf.org/
[12] Joshi, R., & Sahoo, R. (2020). Capital structure and firm performance: Evidence from Indian pharma. *Asian Economic Review, 62*(1), 33–48.
[13] McKinsey & Company. (2021a). *India pharma 2025: A vision for the industry*. https://www.mckinsey.com/
[14] McKinsey & Company. (2021b). *India pharma 2025: Opportunities and challenges*. https://www.mckinsey.com/
[15] Mehta, D., & Bhattacharya, R. (2019). Profitability analysis of Indian pharmaceutical companies. *International Journal of Business and Management, 14*(6), 50–59. https://doi.org/10.5539/ijbm.v14n6p50
[16] Narayanaswamy, R. (2014). *Financial accounting: A managerial perspective*. PHI Learning.
[17] Palepu, K. G., & Healy, P. M. (2013). *Business analysis & valuation*. Cengage Learning.
[18] PricewaterhouseCoopers (PwC). (2020). *Pharma 2020: From vision to decision*. https://www.pwc.com/
[19] Ross, S. A., Westerfield, R. W., & Jaffe, J. (2020). *Corporate finance* (12th ed.). McGraw-Hill Education.
[20] World Bank. (2022). *India development update: Navigating the storm*. https://www.worldbank.org/