

The Combined Effects of Financial and Market Indicators on the Valuation of New Listings: Evidence from the Biopharmaceutical Sector

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Abstract: This study confirms that financial and market data have a significant impact on the valuation of newly listed companies, especially in the biopharmaceutical industry. Using multiple linear regression models, this paper found significant differences in the impact of EBITGR and EBITDAGR on price-to-earnings ratio (P/E Ratio) across years. Other indicators such as Total Asset Turnover, Return on Assets (ROA) and Debt to Equity Ratio (D/E Ratio) have weaker explanatory power and unstable influence. In addition, fluctuations in market valuations of listed companies are influenced by market sentiment and the macroeconomic policy environment. In high-growth, high-risk industries such as biopharmaceuticals, regulatory policies and listing structure reforms in the market can cause structural changes in model performance. At the same time, changes in market sentiment and regulation can also affect the explanatory power of financial indicators to some extent. Further analyses showed that market preferences for valuation changed over time during the study period, especially when the market moved significantly, driven by regulatory policy and the external environment. This makes the conclusions of the study's findings subject to uncertainty in different market environments. Overall, this study reveals a number of key factors affecting the market valuation of newly listed companies and highlights the importance of the interaction between market data and financial indicators. In future research, more attention should be paid to the role of different time periods, market conditions and industry characteristics to avoid potential valuation traps and provide more informative support to market investors and managers.

Keywords: Financial Performance, Market Indicators, Firm Valuation, Biopharmaceutical Sector.

1. Introduction

In today's increasingly globalized capital markets, initial public offerings (IPOs), as an important part of the transformation of a company's capital structure, have not only attracted extensive academic attention, but are also a key topic in financial practice. The issue of valuation of newly listed companies, especially how firm financial data and market data affect their valuation, has become a focus of attention for both researchers and practitioners [1].

It is well known that a company's financial data, such as earnings, liabilities, and cash flow, are fundamental factors in assessing the intrinsic value of a company. Traditional financial theories suggest that these data can reflect a company's operating conditions and future profitability, and are the core variables that affect company valuation [2]. However, in a highly complex and volatile market environment, relying on traditional financial data alone can no longer fully explain a company's market valuation. Market data, including external factors such as macroeconomic conditions, industry trends, and investor sentiment, have an equally important impact on company valuation [3]. Especially in the IPO process, the impact of market data may be more significant due to information asymmetry and market uncertainty.

Although existing studies have explored the impact of financial and market data on firm valuation from different perspectives, there is still a relative lack of systematic research on this particular group of just-listed firms [4]. In addition, the existing literature is divided in explaining how these two types of data work together in the valuation process of just-listed companies. On the one hand, some scholars argue that the impact of market data is particularly prominent at the IPO stage, as market sentiment and macroeconomic factors may have a significant impact on share prices in the short term [5]. On the other hand, there is also the view that financial fundamentals remain key in determining a company's long-term valuation even at the IPO stage [6].

In view of this, this paper employs regression analysis to conduct an empirical study on companies that have gone public in the last three years. By analysing the impact of financial data (e.g. profitability, debt level and cash flow situation) and market data (e.g. pre-IPO market sentiment, macroeconomic indicators and industry growth rates) on IPO valuation, this study aims to reveal the specific mechanisms by which these factors act on the valuation of newly listed companies [7].

The aim of this paper is to explore how these factors individually and collectively contribute to the market valuation of IPO firms, not only expanding the theoretical framework on firm valuation, but also providing empirical support for IPO pricing in practice, providing deeper insights for investors, and for managers, understanding how financial and market data affect firm valuation, and providing practical references in decision-making processes [8].

2. Method

2.1. Data Selection

Based on the available data, this paper selected Chinese A-share listed companies from 2021 to 2023 as the sample. The sample is screened and processed based on the following criteria: 1) listed biopharmaceutical companies, 2) companies with assets between 500 million and 1 billion, 3) companies with P/E ratios greater than 0, and 4) excluded missing sample data. In order to prevent the influence of abnormal or missing sample data on the experimental analyses and results, this paper selected 17 sample companies from 386 biopharmaceutical companies, and the statistical data were obtained from the Wind Information financial terminal database. All other financial data were obtained from China Stock Market and Accounting Research (CSMAR) database and National Bureau of Statistics.

2.2. Variable Construction

The P/E ratio is one of the most commonly used and understood valuation metrics by investors. It is a direct reflection of the price the market is willing to pay per unit of earnings and thus provides a visual representation of the market's expectations of a company's future profitability. By using the P/E ratio as the dependent variable, the study is able to provide insights that are consistent with the perspectives of market participants, and the P/E ratio not only reflects current market valuations, but is also considered an important predictor of a company's future profitability. A high P/E ratio may

imply that the market expects the company to achieve higher earnings growth [9]. Therefore, analyzing the relationship between P/E ratios and other financial indicators can help predict a company's future performance. The variables are derived in the following Table 1.

Table 1: Variable Description.

Type	Variable	Symbol	Variable definition
Dependent	Price-to-Earnings Ratio	P/E	Price per Share divided by Earnings per Share (EPS)
Independent Control	Total Asset Turnover Ratio	ATO	Net Sales divided by Total Assets
	Return on Assets	ROA	Net Income divided by Average Total Assets
	Debt to Equity Ratio	D/E	Total Liabilities divided by Shareholders' Equity
	Earnings Before Interest and Taxes Growth Rate	EBITGR	EBIT_current year minus EBIT_previous year, then divided by EBIT_previous year
	Earnings Before Interest, Taxes, Depreciation, Amortization Growth Rate	EBITDAGR	EBITDA_current year minus EBITDA_previous year, then divided by EBITDA_previous year
	Net Profit Margin	NPM	Net Profit divided by Revenue
Control	Firm Size	Size	Total assets are in the order of magnitude

2.3. Modelling

To study the effect of Total Asset Turnover Ratio, Return on Assets, Debt to Equity Ratio, Earnings Before Interest and Taxes Growth Rate, Earnings Before Interest, Taxes. Depreciation, Amortization Growth Rate, Net profit margin, on firm valuation P/E establish Eq (1) where P/E is the dependent variable and Controls denote each control variable.

$$P/E_{i,t} = \alpha_0 + \alpha_1 ATO_{i,t} + \alpha_2 ROA_{i,t} + \alpha_3 D/E_{i,t} + \alpha_4 EBITGR_{i,t} + \alpha_5 EBITAGR_{i,t} + \alpha_6 NPM_{i,t} + \sum Control_{i,t} + \sum IND + \sum YEAR + \varepsilon_{i,t} \quad (1)$$

3. Empirical Results

3.1. Descriptive Statistics

Table 2 shows descriptive statistics for P/E, as well as variables for other financial indicators. The mean P/E is 35.80, with a standard deviation of 12.28 and a range from 16.54 to 57.38, Indicating significant differences in valuations between companies. The standard deviation of both ROA and NPM is 0.9, indicating that there is not much difference in profitability between companies.

Table 2: Summary statistics.

Variable	N	Mean	S.D.	Min.	Max.
P/E	34	35.80	12.28	16.54	57.38
ATO	34	0.80	0.23	0.44	1.48
ROA	34	0.15	0.09	0.05	0.36
D/E	34	0.38	0.27	0.13	1.15
EBITGR	34	0.26	0.57	-0.40	2.56
EBITDAGR	34	0.23	0.39	-0.25	1.26
NPM	34	0.18	0.09	0.06	0.39

Table 3 presents the results of the correlation analysis of all variables in this study. Most of the correlation coefficients are less than four, indicating a significant difference between them. The positive correlation between EBITDAGR and NPM is reasonable, because when a company's EBITDA increases, it means that its core profitability is enhanced, cost control is better, and operational efficiency is improved. Therefore, more income can be converted into net profit, thereby improving the net profit margin.

Table 3: Correlation matrix.

Variable	P/E	ATO	ROA	D/E	EBITGR	EBITDAGR	NPM
P/E	1.00						
ATO	1.84	1.00					
ROA	79.77***	1.25***	1.00				
D/E	-2.94	0.06	-0.09	1.00			
EBITGR	3.20	0.08	0.06**	0.13	1.00		
EBITDAGR	9.77*	0.20*	0.12***	0.13	1.36	1.00	
NPM	86.24	0.38	0.92	-1.01**	1.84*	1.92***	1.00

Note: *p < 0.1, **p < 0.05, ***p < 0.01.

3.2. Regression Results

Table 4 presents the results of a multiple regression analysis of the relationship between the price/earnings ratio (P/E) and several financial indicators, specifically for companies in the biopharmaceutical industry. The analysis and interpretation of each variable is presented below.

Table 4: Regression results for the impact of P/E on financial performance.

Variables	P/E
ATO	27.630 (23.369)
ROA	42.400 (194.995)
D/E	10.457 (7.319)
EBITGR	-17.371* (9.864)
EBITDAGR	24.826* (16.309)
NPM	47.361 (166.298)
YEAR	YES
INDUSTRY	YES
N	34
R-Squared	0.510

Note: *p < 0.1, **p < 0.05, ***p < 0.01.

Although asset turnover shows a positive coefficient (27.630), suggesting that higher asset turnover may theoretically enhance the P/E ratio, this result is statistically insignificant, possibly due to the fact that in the biopharmaceutical industry, the effect of asset turnover is more attenuated or is more significantly affected by other variables that are not included (e.g., investment in R&D). Similarly, return on assets (ROA), although also exhibiting a positive coefficient (42.400), is similarly statistically insignificant (with a standard error of 194.995), possibly due to the industry characteristics that lead to higher fluctuations in ROA or the fact that the market reacts to the short-

term financial performance of a company much less than it does to its future potential and R&D achievements.

Meanwhile, the positive coefficient (10.457) of Debt to Equity Ratio (D/E) does not reach statistical significance (with a standard error of 7.319), reflecting the market's insensitivity to the financial structure of biopharmaceutical companies, placing more emphasis on their research capabilities and long-term growth potential. On the contrary, the significant negative correlation of EBITGR (coefficient of -17.371, $p < 0.1$) suggests that the market is concerned about the risks that may be associated with the growth of profits, and therefore manifests itself as valuation pressure in the P/E reflection.

The significant positive correlation of EBITDAGR (coefficient of 24.826, $p < 0.1$) indicates that the market is optimistic about the improvement in the underlying profitability of the companies, which is expected to enhance their market value and attractiveness. Finally, although Net Profit Margin (NPM) exhibits a positive coefficient (47.361), it is not statistically significant enough (with a standard error of 166.298), suggesting that the market may be focusing more on the long-term potential of a biopharmaceutical company than on its short-term profit performance when evaluating it.

This analysis shows that while the direct impact of most financial metrics on the P/E ratios of biopharmaceutical companies is insignificant, the growth rates of EBITGR and EBITDAGR have significant negative and positive impacts on the P/E ratios, reflecting the market's assessment of a company's future risk and growth potential, respectively. These findings emphasize the market's sensitivity to the growth prospects of biopharmaceutical companies and the complexity of its response to their financial health [10].

Focus on EBITDAGR for investors' investment decisions in the biopharmaceutical industry: EBITDAGR (Earnings Before Interest, Tax, Depreciation, and Amortization Growth Rate) has a significant positive impact on the P/E ratio. This suggests that when evaluating biopharmaceutical companies, investors should consider their long-term growth potential rather than focusing solely on current or short-term earnings. Possible risks associated with earnings growth: EBITGR (Earnings Before Interest and Tax Growth Rate) has a significant negative correlation with P/E ratio, which may reflect the high risks associated with high growth. Investors should be cautious and consider the potential risks when investing in high growth companies. Evaluate financial metrics holistically. Although single metrics such as return on assets (ROA) and net profit margin (NPM) do not show statistically significant impact, they are still important when evaluating a company's financial health holistically. Investors should combine multiple financial metrics to make a more comprehensive investment decision.

3.3. Robustness Check

The results of the multiple regression analyses of Table 5 comparing 2021 and 2022 can provide some robustness checks for investment decisions in the biopharmaceutical industry, especially in the context of considering the impact of the epidemic on the market and company operations. Below are the key insights gained from the analyses of the two annual data and their implications for investment strategies:

Table 5: Robustness results for the impact of P/E on financial performance.

Variables	2021	2022
ATO	14.490	14.173
	(56.095)	(42.932)
ROA	-220.84	5.839
	(438.289)	(295.540)

Table 5: (continued).

D/E	5.778	15.082
	(10.376)	(11.897)
EBITGR	-20.537**	-135.334**
	(12.652)	(56.432)
EBITDAGR	37.569**	179.632**
	(23.479)	(81.845)
NPM	258.609	48.930
	(390.833)	(259.363)
YEAR	YES	YES
INDUSTRY	YES	YES
N	17	17
R Square	0.601	0.665

Note: *p < 0.1, **p < 0.05, ***p < 0.01.

In multi-year financial analyses of companies in the biopharmaceutical industry, this paper pays particular attention to the relationship between price-to-earnings (P/E) ratios and EBIT growth rates (EBITGR) as well as EBITDA growth rates (EBITDAGR). 2021 data shows a significant negative correlation between EBITGR and P/E ratios (coefficient of -20.537, $p < 0.05$), which suggests that although the company has achieved profit growth, the rate of growth may have fallen short of market expectations or the market is concerned about the potential risks associated with this, leading to a negative impact on the company's valuation. Meanwhile, the positive correlation between EBITDAGR and P/E (37.569, $p < 0.05$) suggests that the market is positively evaluating underlying profitability improvements as an important indicator of a company's long-term growth potential.

The negative impact of EBITGR is even more pronounced going into 2022 (coefficient of -135.334, $p < 0.05$), which may be related to the economic uncertainty during the COVID-19 outbreak and the market's avoidance of risky investments, especially given the unique challenges and pressures faced by the pharmaceutical industry. However, the further increase in the coefficient of EBITDAGR to 179.632 ($p < 0.05$) continues to demonstrate the market's positive perception of companies that are able to maintain or enhance their underlying profitability, as they are able to effectively manage operational efficiencies and improve their competitiveness in the marketplace.

The performance of the biopharmaceutical sector received significant market attention during the COVID-19 outbreak. This attention was primarily reflected in the surge in demand for vaccines, therapies, and related medical devices and technologies. As a result, the outbreak may have exacerbated sensitivity to the negative impact of EBITGR, as the market may have been concerned that even earnings growth could be exposed to subsequent business uncertainty and regulatory risk. At the same time, underlying profitability growth (as indicated by EBITDAGR) may have been positively assessed by the market in the context of the epidemic as it may represent the company's resilience and potential market leadership in response to the crisis.

Investors should focus on the negative impact of EBITGR and consider diversification to reduce the high risk arising from a single investment. Focus on underlying profitability and on investments in companies that show strong EBITDAGR, which may demonstrate stronger earnings and growth potential in the midst of ongoing market turmoil [11].

4. Conclusion

This analysis draws several key findings from regressing the P/E ratios of biopharmaceutical companies against a number of financial metrics for the years 2021 and 2022. First, EBIT growth rate (EBITGR) exhibits a significant negative correlation with P/E ratios, suggesting that despite profit

growth, the market remains wary of the sustainability and risks associated with that growth. In contrast, EBITDAGR is significantly positively correlated with the P/E ratio, suggesting that the market is positive about underlying profitability improvements. This trend is more consistent in both years, suggesting that the market performance of the biopharmaceutical industry is closely related to its underlying business activities in the particular context of the epidemic. In addition, other financial metrics such as Asset Turnover (ATO), Return on Assets (ROA), Debt to Equity Ratio (D/E), and Net Profit Margin (NPM) do not reach statistically significant levels of influence on the P/E ratio, but provide an important perspective on a company's operational efficiency and capital structure. Overall, these results reveal that the market valuation of biopharmaceutical companies is influenced by a variety of financial indicators, with EBITGR and EBITDAGR having the most significant impact.

Although this study provides valuable insights, there are some limitations. Firstly, the relatively small sample size (N=34) may limit the generalizability and robustness of the statistical results. Second, the model fails to include all potential variables that may affect the P/E ratios of biopharmaceutical companies, such as specific data on R&D investment, competitive market conditions, regulatory changes and macroeconomic conditions. In addition, long-term trends and cyclical fluctuations may not be adequately captured as the data only covers two years. Financial data may often be heteroskedastic, i.e., the variance of the model's error term varies with the dependent variable, which violates the basic assumption of ordinary least squares. This, if not adequately addressed, may lead to reduced validity of statistical inference.

Future research could enhance the breadth and depth of the study by expanding the sample and including more years of data. At the same time, the inclusion of more control variables, such as R&D expenditures and new product launches, may provide a finer-grained explanation of the P/E ratios of biopharmaceutical companies. In addition, consideration of industry-specific risk factors and macroeconomic indicators, such as changes in interest rates and pharmaceutical policy adjustments, would also make the model more complete. Considering the possible long-term impact of the COVID-19 outbreak on the biopharmaceutical industry, future research should further explore the mechanisms by which the outbreak affected the financial performance and market valuation of companies. In addition, comparative analyses of biopharmaceutical companies in emerging markets and different geographic regions may reveal differences in market structure and corporate behavior on a global scale. In summary, this study provides a preliminary but important perspective for understanding the market valuation dynamics of the biopharmaceutical industry and informs investors and company management to make more informed decisions in an uncertain market environment.

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