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DUPONT ANALYSIS - A COMPREHENSIVE MEASURE OF RETURN ON EQUITY FOR BANKS

Ashiralieva Shahlokhon Gayratjon kizi

АНАЛИЗ ДЮПОНА — КОМПЛЕКСНАЯ ОЦЕНКА РЕНТАБЕЛЬНОСТИ СОБСТВЕННОГО КАПИТАЛА БАНКОВ

Аширалиева Шахлохон Гайратжон кизи

DUPONT TAHLILI – BANKLAR UCHUN XUSUSIY KAPITAL RENTABELLIGINI (ROE) BAHOLASHNING KOMPLEKS KO‘RSATKICHI

Ashiralieva Shahlokhon G‘ayratjon qizi

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Abstract: Being a strategic approach, the DuPont model serves as an all-encompassing technique to assessing financial performance and management efficiency. This study evaluates the financial performance of JSICB Ipak Yuli for the years 2016 to 2023 using the DuPont analysis that splits ROE into net profit margin, total asset turnover, and equity multiplier. This approach, unlike others, enables a better granular understanding of drivers behind ROE. The results show that a decline by half in profit margin was the most important reason behind the drop in ROE in 2020, meanwhile the increase in efficiency of assets contributed to a rise in total asset turnover. Moreover, the decrease in equity multiplier indicates that there was less reliance on debt financing in the later years. Though there was a decrease in ROE in 2020, the bank was able to recover in a short time due to internally generated profitability and effective cost control. However, it is not without faults such as the reliance on outdated financial information, failing to consider non-financial factors like regulatory changes or environmental elements. Nonetheless, the study shows that DuPont analysis is efficient at revealing performance outcomes and defining performance drivers related to ROE trends in banking.

Keywords: DuPont analysis, ROE, ROA, performance evaluation, financial performance, decision making.

Аннотация: Будучи стратегическим подходом, модель Дюпона служит всеобъемлющим методом оценки финансовой результативности и эффективности управления. В данном исследовании проводится оценка финансовых показателей АО «ИКБ Ипак Йули» за 2016–2023 годы с использованием анализа Дюпона, который разделяет рентабельность собственного капитала (ROE) на чистую прибыльность, оборачиваемость активов и мультипликатор собственного капитала. Такой подход, в отличие от других, позволяет получить более детальное представление о факторах, влияющих на ROE. Результаты показывают, что снижение маржи прибыли вдвое стало наиболее важной причиной падения показателя ROE в 2020 году, в то же время повышение эффективности использования активов способствовало росту коэффициента оборачиваемости совокупных активов. Кроме того, снижение мультипликатора собственного капитала указывает на уменьшение зависимости от долгового финансирования. Несмотря на снижение ROE в 2020 году, банку удалось быстро восстановиться благодаря внутренне генерируемой прибыльности и эффективному контролю затрат. Однако данный метод не лишён недостатков, таких как опора на устаревшую финансовую информацию и игнорирование нефинансовых факторов, включая изменения в регулировании или экологические аспекты. Тем не менее исследование показывает, что анализ Дюпона является эффективным инструментом для выявления результатов деятельности и определения факторов, влияющих на динамику ROE в банковской сфере.

Ключевые слова: анализ Дюпона, ROE, ROA, оценка эффективности, финансовая результативность, принятие решений.

Annotatsiya: Strategik yondashuvning bir turi sifatida, DuPont modeli moliyaviy faoliyat va boshqaruv samaradorligini kompleks baholash usuli hisoblanadi. Mazkur tadqiqot “Ipak Yo‘li” Aksiyadorlik Innovatsion Tijorat Bankiningning 2016–2023-yillardagi moliyaviy faoliyatini DuPont modeli yordamida xususi kapital rentabelligini (ROE) ni sof foyda marjasi, aktivlar aylanishi koeffitsienti va kapital multiplikatori kabi tarkibiy qismlarga ajratgan

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holada tahlil qiladi. Boshqa yondashuvlardan farqli ravishda, DuPont tahlili ROE ko'rsatkichiga ta'sir etuvchi omillarni chuqurroq va batafsil tahlil qilish imkonini beradi. Natijalar shuni ko'rsatadiki, 2020-yilda foyda marjasining ikki baravarga kamayishi ROE ko'rsatkichining pasayishiga olib kelgan eng muhim omil bo'lgan, shu bilan birga aktivlardan foydalanish samaradorligining oshishi umumiy aktivlar aylanish ko'rsatkichining ortishiga xizmat qilgan. Shuningdek, kapital multiplikatorining kamayishi bank faoliyatida so'ngi yillarda qarz mablag'lariga bo'lgan bog'liqlikning pasayganini anglatadi. 2020-yilda ROE ko'rsatkichining pasayishiga qaramasdan, bank ichki foyda manbalari va samarali xarajatlarni boshqarish hisobiga qisqa muddatda tiklanishga erishgan. Shu bilan birga, DuPont tahlili ayrim kamchiliklarga ega bo'lib, eskirgan moliyaviy ma'lumotlarga tayanishi hamda tartibga soluvchi o'zgarishlar yoki atrof-muhit omillari kabi nomoliyaviy faktorlarni hisobga olmasligi mumkin. Shunga qaramay, tadqiqot natijalari DuPont tahlilining bank tizimida ROE dinamikasi bilan bog'liq samaradorlik natijalarini aniqlash va ularni shakllantiruvchi omillarni belgilashda samarali vosita ekanligini tasdiqlaydi.

Kalit so'zlar: DuPont tahlili, ROE, ROA, samaradorlikni baholash, moliyaviy faoliyat, qaror qabul qilish.

■ INTRODUCTION

The management behavior and employee output within organizations are influenced by the type of performance measurement system used. Financial performance indicators, such as cash flow, economic value added (EVA), cost, revenue, profitability, and return on capital employed, can offer valuable insights. These measures help identify areas where management should focus to improve business processes that may be underperforming. However, it has been warned that being reliant only on financial measures could lead management to overlook important non-financial aspects, which may lead to serious consequences.

Furthermore, the model adds additional factors like the return on equity (ROE), return on assets (ROA), and net interest margin (NIM)—which are classified as profitability ratios. These ratios evaluate the bank's financial health concerning its profit-generating capabilities vis-a-vis its equity, total assets, and interest income. For any investor or business owner, Return on Equity (ROE) is one of the most important indicators, as it shows how effectively the company is using the capital invested by its shareholders. ROE helps explain the overall profitability of a company. During financial analysis, it is advisable for a company to make full use of all its available opportunities in order to achieve financial efficiency. To study this more deeply, the DuPont analysis is used.

The concept of the DuPont Model was first introduced in 1918 by experts at the DuPont company, and since then, it has undergone two major modifications [1]. The model is based on ROE, a key indicator of financial profitability, and works by breaking it down into sub-components. This allows for easier and faster identification of which specific financial practices are contributing most to the company's ROE.

Researchers across various countries have applied and studied the impact of the DuPont analysis in different industries. It is widely used as a tool to measure profitability in many sectors. It is also useful in analyzing changes in company performance over the years or for comparing multiple companies at the same time.

S.Christina Sheela and Dr. K. Karthikeyan, in their research, used the DuPont model to evaluate the performance of three major pharmaceutical companies in India. According to their findings, the DuPont model is one of the most comprehensive methods for measuring a firm's profitability. It is especially effective in evaluating investment and management decisions, as well as

financing strategies [2]. Similarly, Vasile Burja and Radu Mărginean applied the DuPont model to Romania's furniture industry and confirmed earlier researchers' conclusions about its usefulness [3].

In another study, Mrs. K. Bhagya Lakshmi and Dr. S. Saraswathi analyzed data from 10 automobile companies over a five-year period. Their findings also emphasized the DuPont model's effectiveness in supporting managerial decision-making. The companies they studied showed higher profitability by maintaining lower financial leverage and improving asset turnover [4].

According to Saidi Ahlam and Benmouffeki Ali, the ultimate financial goal of any company should be to maximize shareholder value. The amount invested by shareholders should grow proportionally to the level of risk they accept. Only under such circumstances can a company be considered financially healthy. For this reason, DuPont analysis examines ROE with a focus on the following three objectives [5]:

- Maximizing profit from company operations;
- Utilizing company assets to their full potential;
- Achieving optimal benefit from leverage.

“While traditional financial performance metrics, such as ROE, are commonly used in the property industry, they often provide a broad overview without revealing the underlying drivers of profitability” [6]. This is where the DuPont method excels. By breaking down ROE into its constituent parts, it provides a deeper understanding of how well property companies are managing their resources, generating profits, and leveraging assets to create value for shareholders.

■ METHODOLOGY

In this paper, the three-step DuPont model is utilized for the evaluation of financial performance of Joint Stock Innovation Commercial Bank "Ipak Yuli". Indicators that are needed for the calculations, has been collected from the financial statements of Ipak Yuli bank from 2016 to 2023.

Here is a general presentation of the object of the study. JSICB Ipak Yuli was established in 1990 and has been serving customers since then. The Bank conducts business across key business segments, including:

- Small and private business;
- Corporate banking;
- Retail banking;
- Financial institutions;
- Investment services.



With a growing regional presence, the Bank Ipak Yuli has 17 branches—9 in regions and 8 in Tashkent city—together with 30 mini-banks and 22 specialized cash desks. Moreover, the Bank has deployed over 10,000 payment terminals alongside with more than 400 ATMs nationwide. The "Ipak Yuli" Bank plans to expand further by opening new branches in line with its three-year strategy to ensure widespread accessibility of Bank's products and services in the vast majority of regions.

To enhance digital banking services, "Ipak Yuli" offers mobile applications for both individuals, "Ipak Yo'li Mobile", and businesses, "Ipak Yo'li Mobile for

Business", as well as an Internet banking platform for convenient and smooth transactions. The management bodies of Bank are consisted of the following key bodies:

- General Meeting of Shareholders - supreme governing authority of Bank;
- Bank's Council – manages the strategic direction of the Bank, with exception to decision of issues, which are attributed to the exclusive competence of General Meeting of Shareholders by the Charter;
- Management Board of Bank - responsible for the day-to-day operations and executive decision-making in line with the bank's strategic goals.

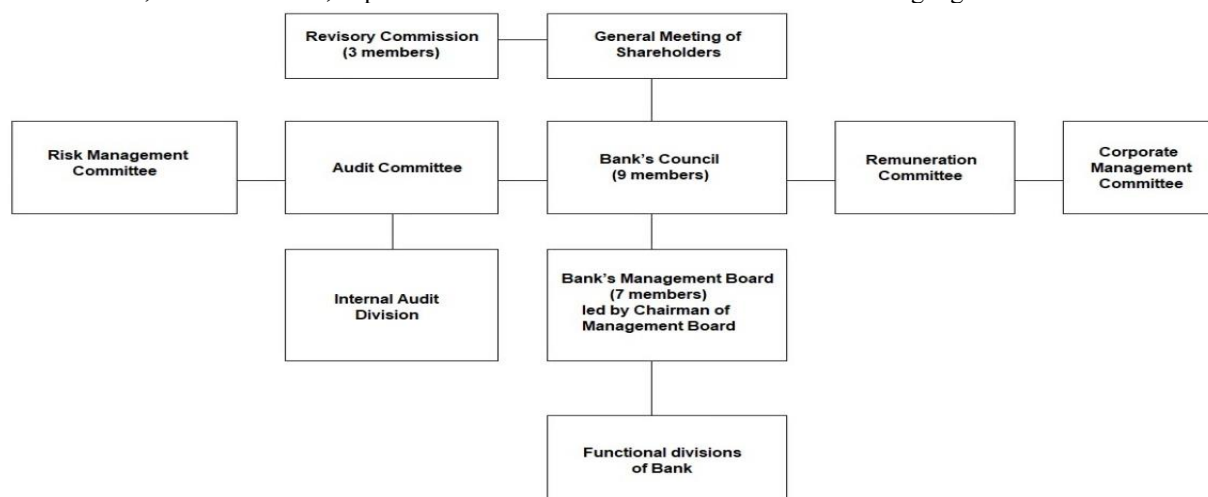


Figure 1. Corporate management of the Bank Ipak Yuli

The Audit Commission conduct independent control over the financial and economic activities of Bank to ensure transparency and regulatory compliance.

Moreover, the Bank's Council is also responsible for supervising over Bank's activities, ensuring competent management, managing lending and investing funds effectively to protect the interests of depositors, creditors and shareholders, setting and reviewing business strategies and development plans, maintaining adequate capitalization, supervising the Internal Audit Department, monitoring financial performance and exercising other powers based on the interests of Bank.

Duties allocated to management and the Supervisory Board regarding preparation and presentation of the financial statements. Management is accountable for the whole process that is the process of designing and fairly presenting the financial statements which align with IFRS standards, and that also include the development and implementation of an adequate system of internal controls resulting in accurate financial statements devoid of material misstatements due to fraud or errors of judgment and other human error.

During the preparation of the financial statements, management is responsible for evaluating the Bank's ability to function as a going concern. Any issues that would relate to the smooth functioning of the bank must be declared. Where applicable, they must implement the going concern basis of accounting unless management plans to liquidate the Bank, discontinue operations, or no viable alternative exists but to do so.

Responsible of overseeing the Bank's financial reporting process to ensure its integrity and compliance with relevant standards is placed on the Supervisory

Board. According to the legislation of the Republic of Uzbekistan, all types of commercial banks, irrespective of their form of ownership, need to maintain accounting records in accordance with instructions issued by the Central Bank and Ministry of Finance. In accordance with Article 74 of Law No. ZRU-580 dated 5 November 2019 On Banks and Banking Activity (the "Law"), Ipak Yuli Bank is, as well, responsible to prepare monthly, quarterly, and annual reports regularly and submits them to the Central Bank in a timely manner.

Additionally, Management is accountable to maintain internal controls and organize risk management systems in harmony with the requirements established by the CBU and to supervise the Bank's compliance with prudential ratios.

The format, structure, and methodological guidelines on how to prepare and submit financial statements are established by the CBU. Moreover, banks, including Ipak Yuli Bank, must publish their financial statements in the prescribed form and within the deadlines set by the CBU, after getting their financial statements checked for the accuracy of the disclosed information.

The annual financial statements of Ipak Yuli Bank that is disclosed include:

- Statement of financial position;
- Statement of profit or loss and other comprehensive income;
- Statement of changes in equity;
- Statement of cash flow;
- Notes to the financial statements.

The three-step DuPont analysis provides users with a powerful framework with what the financial



performance of companies can be compared and companies' operational practices that generate higher profitability can be identified. This framework breaks down Return on Equity (ROE) into three key components, offering deeper insights into how a company generates profits for its shareholders on the top of their investments. The formula for ROE under the DuPont model is as follows:

$$\text{ROE} = \text{Net Profit Margin} \times \text{Total Asset Turnover} \times \text{Equity Multiplier [1]}$$

- Net profit margin serves as a critical indicator of a company's financial efficiency; demonstrating the percentage of revenue that remains as profit after all of the expenses are deducted. This metric not only reflects a firm's ability to generate earnings from sales but also depicts its effectiveness in managing costs and pricing strategies. This profitability measure gives particularly insightful view when analyzing returns from investment. A high margin often indicates that capital investments are being deployed effectively; by through strategic pricing models that maximize revenue or through prudent expense management that minimizes waste. The calculation is straightforward:

$$\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Total Income}} * 100 \quad [2]$$

- The asset turnover ratio is also a crucial metric that evaluates how effectively management utilizes company assets to generate revenue. This financial indicator is utilized to measure the amount of revenue produced per monetary unit invested in assets, providing detailed insights into operational efficiency and resource allocation. Moreover, it becomes particularly valuable when companies within the same industry are compared to one another, as it reveals which firms are extracting the most value from their asset investments. A consistently high ratio often indicates competitive advantages in operations management or very good business model efficiency. The ratio is calculated as follows:

$$\text{Total asset turnover} = \frac{\text{Total income}}{\text{Total assets}} * 100$$

[3]

- Equity multiplier expresses the ratio of debt in a capital structure compared to total assets for a company under examination. It gives an illustration on the risk premium and the uncertainty level of the firm's expected returns. A company with a leverage ratio greater than 1 uses more borrowed funds and therefore, assets, increases returns on equity (ROE), but needs to service debt, equity, and interest expenses. This indicates amplified risk. Although tough performance leads to difficult debt servicing obligations, debt dependency facilitate a higher return for shareholders when the company does well.

Conversely, lower leverage ratios show that a company is less exposed to debt in financing its assets. This means the company takes more risk eliminator stance, resulting in reduced financial strain, but also lower returns on equity for shareholders. Earning stability improves, but when debt level is low, potential for earnings surge becomes restricted. Calculated as:

$$\text{Equity Multiplier} = \frac{\text{Total assets}}{\text{Shareholder's Equity}} \quad [4]$$

The DuPont model provides a sophisticated breakdown of Return on Equity (ROE) by decomposing it into three fundamental drivers:

$$\text{ROE} = \frac{\text{Net Profit}}{\text{Total Income}} * \frac{\text{Total income}}{\text{Total assets}} * \frac{\text{Total assets}}{\text{Shareholder's Equity}} \quad [5]$$

The DuPont analysis transforms ROE from a simple outcome measure into a dynamic diagnostic tool for evaluating all aspects of business performance.

■ Results and discussion

Applying the decomposition model DuPont analysis makes the financial performance more transparent than utilizing traditional way of calculating ROE itself. The pyramidal structure enables to investigate the mutual relationships between financial variables. The DuPont analysis model for the financial indicators of JSICB Ipak Yuli for the period from 2016 to 2023, is depicted in the following tables.

Table 1

Net Profit Margin				
Year	Net profit (in mlns of Uzbek Soums)	Total income (in mlns of Uzbek Soums)	Net Profit Margin (NPM)	Net Profit Margin (NPM) (in %)
2016	54 450	179 664	0.3031	30.31
2017	105 697	249 157	0.4242	42.42
2018	141 494	366 785	0.3858	38.58
2019	227 699	530 832	0.4289	42.89
2020	188 707	817 938	0.2307	23.07
2021	394 915	1 068 215	0.3697	36.97
2022	522 935	1 480 457	0.3532	35.32
2023	731 342	2 093 031	0.3494	34.94

As shown in Table 1, the bank's net profit margin ratio has ranged from 30.31 percent to 42.89 percentage points over the eight-year period. In 2016, net profit margin ratio stood at 30.31%, which increased to 42.42% in the following year and was comparably higher until

2019. In 2020, the ratio declined nearly twice, from 42.89% in 2019 to 23.07% in 2020, due to fall in the amount of net profit, whereas total income increased in number. Though, the ratio recovered to 36.97% in 2021, it reduced slightly to 34.94% in 2023.

Table 2
Total asset turnover

Year	Total income (in mlns of Uzbek Soums)	Total assets (in mln Uzs)	Total asset turnover (TAT)	Total asset turnover (TAT) in %
2016	179 664	2285597	0.0786	7.86
2017	249 157	3244731	0.0768	7.68
2018	366 785	3954898	0.0927	9.27
2019	530 832	5 328 199	0.0996	9.96
2020	817 938	6 900 719	0.1185	11.85
2021	1 068 215	9 482 231	0.1127	11.27
2022	1 480 457	13 125 912	0.1128	11.28
2023	2 093 031	16 914 336	0.1237	12.37

In Table 2 total asset turnover of the bank is presented and it increased by 4.51 percentage points throughout the eight-year period. The ratio was at 7.86% in 2016. After a small drop in 2017, it raised to 9.27% in

2018 and kept increasing until it faced another small drop in 2021, becoming 11.27%. In the last year provided, the ratio increased to 12.37%.

Table 3
Equity Multiplier

Year	Total assets (in mln Uzs)	Shareholder's Equity (in mln Uzs)	Equity Multiplier
2016	2285597	209033	10.93
2017	3244731	337090	9.63
2018	3954898	502035	7.88
2019	5 328 199	729 249	7.31
2020	6 900 719	1 120 781	6.16
2021	9 482 231	1 491 673	6.36
2022	13 125 912	2 133 021	6.15
2023	16 914 336	2 817 695	6.00

As final component of the DuPont model, the equity multiplier determines a bank's financial leverage by evaluating its ability to use debt to fund its assets (Table 3). In 2016, the bank's total assets were 10.93 times more than its shareholder's equity. The equity multiplier ratio decreased considerably over the eight-year period, dropping by 0.62 on average and become 6

in 2023. Both total assets and shareholder's equity of the bank showed increasing trend, but shareholder's equity multiplied faster. Between the years 2016 and 2020, the ratio reduced dramatically from 10.93 to 6.16 times. Afterwards, a little raise in 2021 reduced the speed of reduction.

Return on Assets and return on equity

Year	Net Profit Margin (NPM)	Total asset turnover (TAT)	Equity Multiplier	ROA	ROA (in %)	ROE	ROE (in %)
2016	0.3031	0.0786	10.93	0.02	2.38	0.2605	26.05
2017	0.4242	0.0768	9.63	0.03	3.26	0.3136	31.36
2018	0.3858	0.0927	7.88	0.04	3.58	0.2818	28.18
2019	0.4289	0.0996	7.31	0.04	4.27	0.3122	31.22
2020	0.2307	0.1185	6.16	0.03	2.73	0.1684	16.84
2021	0.3697	0.1127	6.36	0.04	4.16	0.2647	26.47
2022	0.3532	0.1128	6.15	0.04	3.98	0.2452	24.52
2023	0.3494	0.1237	6.00	0.04	4.32	0.2596	25.96

Multiplication of net profit margin by total asset turnover gives the result of the ratio of return on assets (Table 4). The percentile of return on asset was 2.38 in 2016 and it rose steadily over the next few ears, until hitting 4.27 percent in 2019. Then, the ratio experienced a sharp decline to 2.73% in 2020, et recovered to 4.16% in 2021. After a little dip, it finally climbed to 4.32% in 2023. While a higher ROA contributes to the return on equity (ROE) calculation as a part of the equation of calculating the later, the higher return on asset ratio not necessarily mean the higher return on equity. The ratio of return on equity exhibited greater fluctuations over the eight-year period, reaching its highest point of 31.36% in 2017. Return on equity ratio was 26.05% in the first ear of study prerioid and it surpassed 30 percent in 2017 and 2019. Like return on assets ratio, return on equity hit the lowest point in 2020, dropping to 16.84%.

The financial performance of JSICB Ipak Yuli was better understood after completing the DuPont analysis, as this framework gives a clear view of what influenced changes in the bank's return on equity over time. First of all, profitability (net profit margin) had the biggest impact on ROE fluctuations. Yet, the bank improved its efficiency in using assets, as shown by a rising asset turnover ratio. Over the ears, the bank relied more on shareholders' equity, lowering its financial risk.

On the other hand, Manap A. and others claim that "One significant limitation of the DuPont method is its reliance on historical accounting data" [7]. Financial reports may narrate events of business performance in the past. However, these reports fail to indicate or even project the position of the market concerning external factors and coming threats.

Moreover, DuPont analysis does not take into account major non-financial factors that are crucial for businesses. Examples include shifts in government policies, climate change laws, and changing customer tastes. For example, new zoning laws or requirements for green buildings could greatly jeopardize profitability, but DuPont's concentration on historical data overlooks these factors.

Lastly, while the DuPont model captures financial leverage via the equity multiplier, it does not assess how well the company is controlling its debt. Debt can

enhance return on equity, but excessive debt levels increase financial risk if market conditions worsen. The simplistic approach of DuPont on leverage may mask the extent to which debt compromises long-term financial viability.

Nevertheless, DuPont analysis is a valuable tool for identifying the factors that influence the rise or fall in the income generated from the use of shareholder equity. It not only highlights the strengths and weaknesses of a business but also gives a way to clarify the connection between the outcomes and the reasons behind them. One of the key advantages of the DuPont model is that it can be still applied to companies that do not have any financial debt, making it a versatile tool in financial analysis.

Conclusion

The results from the DuPont analysis provides a deeper understanding of the financial dynamics behind JSICB Ipak Yuli's performance. Net profit margin had a major impact on ROE, especially during periods of sharp ROE declines and recoveries, which coincided with net profit margin changes. Total asset turnover showed an upward trend in asset utilization, which means that the bank was more efficient in revenue generation relative to its gross assets. Meanwhile, with the decrease in financial leverage over the ears, equity multiplier has adopted a more conservative financial structure that uses debt less.

The bank was able to sustain healthy ROE values despite the fluctuations, which further compliments the bank, considering the reduced leverage it sustained, proving good internal profit generation capabilities. In other words, the financial situation of the bank improved, bolstered by better asset use, stable profitability, and lower debt levels. The DuPont model offered insight into the factors affecting changes in ROE and helped identify the plan of action taken by the bank's management towards its finances.

In short, ROE that is based on the DuPont model is considered one of the most comprehensive and effective analysis methods for evaluation of a company's financial condition. Specifically, it is highly useful in identifying both the strengths and weaknesses in areas such as management efficiency, debt levels, and the profitability of capital employed, all of which are



essential for a company to remain competitive in the fast-growing market.

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