





“Impact of sales methods on profitability in the Japanese software industry: Resource allocation perspectives”

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IMPACT OF SALES METHODS ON PROFITABILITY IN THE JAPANESE SOFTWARE INDUSTRY: RESOURCE ALLOCATION PERSPECTIVES

Abstract

This study investigates how sales methods, service management, and resource allocation influence the operating profit margins of Japanese software companies, with a focus on marketing strategies and profitability improvement. While Japan's software market continues to grow, domestic companies face challenges such as low profit margins, reliance on subcontracting, and declining international competitiveness. Using data from 124 software companies listed in the Nikkei industry-specific section between 2021 and 2023, this study employs multivariate regression analysis to identify actionable strategies for enhancing profitability.

The results reveal that the selling, general, and administrative (SG&A) expense ratio negatively affects operating profit margins, emphasizing the importance of cost control. Companies that adopt indirect sales channels achieve significant cost efficiency, improving profit margins (coefficient: -0.1363). Furthermore, while the ratio of sales growth to gross profit growth positively influences profitability (coefficient: 0.0084), its effect is relatively modest. In contrast, the revenue efficiency ratio emerges as the most influential factor, where a 1% improvement corresponds to a 0.72% increase in operating profit margins (coefficient: 0.7166). These findings underscore the critical role of optimizing resource allocation and aligning sales strategies with marketing objectives to achieve sustainable profit growth.

This study contributes to the literature by integrating marketing-oriented strategies with operational efficiency, addressing the often-overlooked interplay between these factors. By offering practical insights into channel strategies, cost optimization, and resource allocation, this research provides a roadmap for Japanese software companies to strengthen their competitiveness in both domestic and international markets.

Keywords

software companies, operating profit margin, sales channel strategy, service management, resource allocation, revenue efficiency, cost optimization, competitiveness improvement

JEL Classification

L25, O32, M21

INTRODUCTION

The Japanese software market has demonstrated significant growth in recent years, driven by increased demand for business software, embedded systems, and cloud services. However, domestic software companies face persistent challenges, including heavy reliance on subcontracting, weak profitability, and declining international competitiveness. In 2020, private sector IT investment in Japan reached approximately 15.2 trillion yen, with 60% allocated to software-related expenditures. Despite this investment, foreign companies dominate the market, as evidenced by an ICT import surplus of 3.5 trillion yen, highlighting Japan's diminished global standing in the software industry.

To address these challenges, Japanese software companies must adopt strategies that enhance their operating profit margins, which are es-



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essential for achieving sustainable growth and strengthening competitiveness. This study focuses on three critical factors: (1) stable sales growth, (2) cost management and efficiency, and (3) the quality and balance of profits. These factors are pivotal for developing comprehensive strategies that align with marketing objectives and optimize resource utilization.

Unlike previous studies, which primarily analyze these factors in isolation, this research adopts an integrative approach. It examines how sales methods – particularly channel strategies – interact with service management and resource allocation to influence operating profit margins. By bridging gaps in existing literature, this study provides actionable insights for enhancing corporate performance in competitive markets.

Specifically, this study evaluates the role of indirect sales channels in reducing selling, general, and administrative (SG&A) costs and improving profit margins. It also investigates how efficient cost management in product and service operations sustains gross profit margins and how the revenue efficiency ratio – a key indicator of resource optimization – serves as a critical determinant of profitability. These findings highlight the importance of aligning sales strategies with marketing goals to enhance competitiveness and achieve sustainable growth.

This research not only addresses the interplay between marketing and operational factors but also offers practical guidance for Japanese software companies to overcome profitability challenges. By optimizing sales channels, managing costs effectively, and allocating resources strategically, companies can achieve higher operating profit margins and secure a competitive edge in both domestic and international markets.

1. LITERATURE REVIEW

In corporate management, the operating profit margin is an extremely important indicator of a company's profitability in its core business and is an essential factor for managers to sustain and enhance long-term growth and competitiveness. A high operating profit margin indicates that a company manages costs efficiently and generates sufficient profits from its core operations, thereby providing a stable financial foundation in the face of external fluctuations and market competition. Furthermore, companies with higher operating profit margins tend to be highly regarded by investors and shareholders, enhancing their attractiveness as investment opportunities.

Besides, managing the operating profit margin effectively leads to improvements in internal operational efficiency, cost reduction, and strategic investment decisions, thereby forming the basis for establishing long-term competitive advantage. Therefore, maintaining and improving the operating profit margin should not be viewed as merely securing short-term profits but as a core element that supports sustainable development and should be central to corporate strategy.

Previous studies focus mainly on growth strategies, operational efficiency, and the quality and balance of profits as factors affecting the operating profit margins of software companies; however, comprehensive analyses of how these factors specifically affect operating profit margins have been insufficient. Growth strategies, such as entry into emerging markets and global expansion, have been highlighted for their influence on operating profit margins in software companies; however, deep exploration of how these strategies contribute to profit margins is limited.

Siimann and Alver (2015) demonstrate that equity and profit margins have the greatest effect on profit per employee, noting that small companies achieve higher profits per employee than medium-sized companies. Additionally, Serpeninova et al. (2022) find that among the intellectual capital components (organizational, human, and relational capital) in the Slovak software companies, only acquired intangible assets had a positive effect on all profitability indicators, while the other elements showed little or negative direct effect. They conclude that it is necessary to improve financial information on intellectual capital and revise accounting standards to manage intellectual capital more effectively.

Furthermore, Chen et al. (2005) show that intellectual capital affects a company's market value and financial performance significantly, with human, physical, and structural capital contributing to value creation in different ways. They confirm that research, development (R&D) expenditure has a notable effect on improving profit margins and market value, and that measuring the efficiency of intellectual capital serves as a useful indicator for predicting future financial performance. They conclude that managing intellectual capital is essential for maintaining corporate competitiveness.

Namugenyi et al. (2019) examine the effect of intellectual capital on corporate profitability, revealing that human and structural capital have a strong influence on financial performance and contribute to improving profit margins. They show that companies with higher intellectual capital efficiency are more likely to establish a competitive advantage and secure sustainable profitability. Furthermore, effective management and utilization of intellectual capital are essential for long-term profit growth, enabling companies to strengthen their market competitiveness.

While these studies focus on the effect of intellectual capital and intangible assets on corporate profitability and market value, there has been insufficient examination of their interactions with other factors such as sales strategies, growth, and operational efficiency. Although intellectual capital and equity have been individually analyzed for their effect on profitability, comprehensive research on how sales methods and operational efficiency contribute to operating profit margins and how these factors work together to enhance competitive advantage is still lacking.

Aboody and Lev (1998) point out that the capitalization of software development costs is related to stock prices and shareholder value, and investors base their decisions on this information. They also suggest that capitalized software development costs are associated with future revenues, and that fully expensed software development costs may also be reflected in the market to some extent, potentially influencing future revenue forecasts. Dedrick et al. (2003) confirm that IT investments contribute to productivity improvements and affect profitability

positively. IT promotes improvements in business processes, thereby leading to increased productivity and profit margins. Moreover, the effectiveness of IT investments is enhanced by their complementary relationships with organizational capital and management practices. To effectively utilize IT, organization-wide transformation is necessary, including business process redesign and employee skill development, going beyond mere automation.

Leonidou et al. (2002) suggest that pricing strategies and credit policies in export markets may influence corporate profitability. They point out that a low-pricing strategy does not necessarily have a positive effect on profitability, whereas credit policies may improve customer satisfaction and contribute to profitability. Hawawini et al. (2000) reveal that factors specific to company size have a significant effect on profitability. They conclude that company-specific factors play a significant role in the success or failure of industry leaders and underperforming companies, whereas other companies are influenced more by overall industry trends.

These studies individually analyze the effects of software development costs, IT investments, pricing strategies, and company-specific factors on profitability without sufficiently examining how these factors interact with sales strategies and operational efficiency to contribute to overall corporate profitability. Additionally, while emphasizing the direct effect of capitalized software development costs and IT investments on financial performance, there is a lack of discussion on how sales strategies and growth work together with these factors to enhance profitability. Furthermore, research that comprehensively examines pricing strategies and company-specific factors along with their relationships with growth and operational efficiency remains limited, highlighting an area for future investigation.

Vickery et al. (2003) investigate the effect of integrated supply chain strategies on customer service and financial performance and demonstrate that integrated information technology and supply chain integration have an indirect positive effect on financial performance through customer service. They conclude that improving customer

service is a key factor in companies gaining financial benefits through supply chain integration. Similarly, Bhagwat and Sharma (2007) confirm that integrated supply chain strategies contribute to improving financial performance and profit margins through enhanced customer service, concluding that efficient supply chain management and improved customer service are essential for increasing profitability. Rai et al. (2006) note that the integration of IT infrastructure promotes the integration of supply chain processes, contributing to operational efficiency and revenue growth. They argue that the integration of information flow and physical resource management strengthens a company's competitiveness and is expected to improve performance across the supply chain. Additionally, they conclude that the effective integration of IT infrastructure is essential for improving long-term corporate performance.

Hitt et al. (2002) indicate that the introduction of ERP systems affects cost management and efficiency, leading to improvements in profitability and asset utilization. They note that ERP implementation improves inventory turnover and asset utilization, strengthens cost management, and enhances operational efficiency. They also argue that the cost-reduction effects of ERP implementation contribute to long-term sales growth stability and enhance market evaluations.

Shang and Seddon (2002) demonstrate that the introduction of enterprise systems (ES) affects cost management and efficiency, realizing operational and managerial cost reductions and efficiency improvements. They argue that companies can enhance operational efficiency through process integration and strengthen cost management through ES implementation, further emphasizing that an effective IT infrastructure leads to long-term stable profits.

Hendricks et al. (2005) study the effects of ERP, SCM, and CRM systems on long-term stock performance and profitability, and note that while ERP implementation leads to improvements in profit margins, no significant effects on stock prices were observed.

They suggest that SCM systems can improve profitability and stock prices, while CRM systems do not show clear improvements in profit-

ability or stock prices. While the implementation of these systems does not necessarily enhance financial performance, they argue that the successful implementation of ERP and SCM systems could lead to improvements in profitability and performance.

These prior studies individually analyze the effects of supply chain strategies, IT infrastructure integration, and ERP system implementation on financial performance and operational efficiency; however, consideration of their interaction with sales strategies and growth is limited. Although the integration of supply chains and IT infrastructure has been shown to enhance competitiveness and efficiency, an analysis of how these factors work together with sales strategies and growth to improve operating profit margins is lacking. Additionally, although the effect of ERP, SCM, and CRM systems implementation on profitability has been discussed, comprehensive research evaluating the relationship between these systems and sales strategies or operational efficiency remains limited.

Rust et al. (2002) emphasize that quality improvement efforts have a significant effect on financial performance and profitability. They conclude that a quality improvement approach that prioritizes revenue expansion is more effective for profit improvement than approaches that focus solely on cost reduction or that simultaneously pursue revenue expansion and cost reduction. Moreover, they indicate that strategies focused on revenue expansion are the key to strengthening long-term competitiveness and securing sustainable profits, emphasizing that companies should adopt approaches that prioritize quality improvement and revenue growth to maximize profits.

Ramasubbu et al. (2021) point out that, although it is possible to improve profit margins by creating imbalances in team expertise and staffing, this may affect productivity and quality negatively. They argue that when prioritizing profitability, managing the balance between quality and productivity is a critical challenge, and companies need clear guidance on how to structure software development teams and manage tradeoffs to achieve specific project outcomes.

Despite these analyses of the effect of quality improvement and team structure on profitability and profit margins, they do not sufficiently consider their interactions with sales strategies, growth, and operational efficiency. Although they show that quality improvement contributes to profit growth, and that team expertise and structure affect profit margins, they do not discuss how these elements work together with sales strategies and operational efficiency to maximize overall corporate profitability. Furthermore, although trade-offs for improving profit margins have been suggested, comprehensive analyses of how these factors function together to improve profitability are lacking.

Kaltenecker et al. (2015) point out that companies face low profit margins in the early stages of transitioning to the on-demand market, emphasizing the importance of developing strategies to overcome declines in profitability and profit margins when transitioning from the on-premise to the on-demand market. Porter (2001) emphasizes the importance of strategic positioning in competitive advantage, stating that to ensure sustainable profit margins, companies need to create a sufficient gap between prices and costs. He argues that merely increasing revenue or reducing costs does not generate economic value, and that by centering profit margins in strategy, companies can create true economic value and build competitive advantage.

Morris et al. (2005) argue that a business model has a significant effect on a company's success and should be evaluated at three levels: economic, operational, and strategic. At the economic level, the focus is on revenue sources, cost structures, and profit margins. At the operational level, internal processes and infrastructure design are critical for value creation. At the strategic level, market positioning and securing competitive advantage are essential. They emphasize that business models must be flexible to adapt to changes in the market environment.

Shafer et al. (2005) focus on how the business model contributes to corporate value creation, stating that it serves as a strategic tool for managing costs and operating efficiently. They suggest that building an appropriate business model enhances operational efficiency and contributes to cost reduc-

tion, arguing that to achieve sustainable growth, it is essential to make strategic choices and leverage value networks effectively.

Zott and Amit (2010) identify "content," "structure," and "governance" as key elements of business model design, arguing that by optimally combining these elements, companies can improve efficiency and reduce costs. Additionally, by utilizing the design themes of "novelty," "lock-in," "complementarities," and "efficiency," companies can build efficient activity links and enhance cost management while securing sustainable profits.

Gambardella and McGahan (2010) explore how the commercialization of general-purpose technologies (GPT) affects corporate competitive advantage. GPTs are not limited to specific applications and can be applied in various markets and industries. They note that by offering technologies to multiple licensees, technology providers can strengthen their bargaining power and maximize profits. They argue that broad applications of GPTs can generate stable revenue, and business model innovation can have unpredictable impacts on industrial structures.

These studies focus on profitability and competitive advantage in relation to business models and market transitions; however, there is insufficient analysis of how these factors work together with sales strategies and operational efficiency to improve corporate operating profit margins. Although strategies for improving profitability have been discussed in relation to the transition from an on-premise to an on-demand market and business model design, detailed consideration of how sales methods and growth strategies influence profitability is lacking. Furthermore, while discussions exist on the effect of GPT commercialization and business model innovation on competitive advantage, comprehensive analyses of how these factors interact with operational efficiency and sales strategies to improve profitability are limited.

Fang et al. (2008) suggest that transitioning from a product-centric to a service-centric business model can affect corporate value positively. They find that this effect depends on the proportion of service revenue and the company's circumstances,

with a notable positive effect on corporate value when the proportion of service revenue exceeds 20-30%. However, they note that this effect varies depending on industry characteristics and company resources, as well as the industry's growth rate and volatility.

Cavusgil and Zou (1994) suggest that export-marketing strategies affect sales growth stability, concluding that adopting strategies suitable for the product and market improves export performance and enables sustainable sales growth. They further argue that a company's international capabilities and management commitment contribute to the success of export strategies and that product and promotion adaptation and enhanced price competitiveness are important factors in achieving stable sales growth.

Griffin and Hauser (1995) point out the effect of integrating marketing and R&D on sales growth stability in new product development. They argue that cooperation and communication between the two departments contribute to shortening time-to-market and improving success rates, which are critical for achieving sustainable sales growth. They also identify physical distance and cultural differences as factors that hinder marketing and R&D integration and suggest that appropriate organizational methods and management processes are needed to overcome these barriers.

These studies individually analyze the effect of transitioning from products to services, export-marketing strategies, and marketing and R&D integration on corporate value and sales growth. However, a comprehensive consideration of how these factors contribute to corporate sales strategies, operational efficiency, and profitability is lacking. Although the effects of service-centric businesses and export strategies on sales growth have been discussed in detail, there has been insufficient analysis of how these elements relate to operational efficiency and profit margin improvement.

Bharadwaj et al. (2013) demonstrate that digital business strategies are directly related to improving cost management and efficiency, arguing that the use of digital technologies can optimize business processes and supply chains. They emphasize

that the richness of information and global connectivity enabled by digital technologies contributes to corporate growth and the establishment of competitive advantage, arguing that companies that effectively leverage digital resources can expect sustained growth and improved profit quality.

Hoque and James (2000) explore the effect of balanced scorecard implementation on corporate performance improvement, showing that companies can reduce costs and improve efficiency while ensuring stable sales growth by effectively utilizing the four perspectives of finance, customers, internal business processes, learning, and growth. They also argue that optimizing the quality and balance of profits promotes sustainable growth of the company as a whole.

These studies individually analyze the effect of digital technology utilization and balanced scorecard implementation on corporate efficiency and growth. However, comprehensive consideration of how these factors interact with sales strategies and operational efficiency to contribute to overall corporate profitability is lacking. While the optimization of business processes and the establishment of competitive advantage using digital technologies have been discussed, analysis of how these relate to sales methods and growth strategies in improving profit margins is insufficient. Additionally, while the performance improvement effects of balanced scorecard implementation have been discussed, there has been limited discussion of how they relate to operational efficiency and sales strategies, even though adjustments based on company size and market factors have been suggested.

Synthesizing these studies reveals that growth strategies, operational efficiency, and quality and balance of profits have a combined effect on the operating profit margins of software companies. Growth strategies contribute to improving profit margins through entry into emerging markets and optimizing product portfolios; however, further research is needed to clarify how these strategies specifically affect operating profit margins. Conversely, improvements in operational efficiency have been shown to directly affect operating profit margins through cost management, confirming that efficient resource management is a key factor in maintaining competitive advantages.

Pursuing high-quality profits from a long-term perspective has been demonstrated to be critical for ensuring sustainable growth and improving operating profit margins. While prior studies highlight the importance of these factors, many questions remain about the specific mechanisms and detailed effects. This research contributes by comprehensively examining these factors to clarify their specific effects on operating profit margins.

Various business strategies, including sales methods, service management, and resource allocation, play a crucial role in enhancing corporate profitability. As digital technologies advance and market competition intensifies, companies must effectively implement and optimize these strategies to maximize profits. Regarding sales strategies, the selection and deployment of sales channels have a direct impact on revenue. Moreover, service management and resource allocation are essential for cost reduction and operational efficiency, both of which significantly influence corporate profitability. Given these dynamics, understanding the impact of these factors on corporate profits is essential for developing a sustainable growth strategy.

2. AIM AND HYPOTHESES

This study aims to investigate how sales methods, service management, and resource allocation influence the operating profit margins of Japanese software companies, with a focus on marketing strategies and profitability improvement.

This study proposes the following hypotheses

H1: Sales methods (channel strategies) impact corporate profits; specifically, selling, general, and administrative (SG&A) expenses influence operating profit margins.

H2: Cost management efficiency in product and service operations affects gross profit margins, ultimately improving operating profit margins.

H3: The revenue-efficiency ratio and optimal resource allocation influence management efficiency, contributing to sustainable profitability.

3. METHODOLOGY

In this study, the data from 124 companies specializing in software development and provision and listed in the industry-specific section of the Nikkei were analyzed to identify the factors affecting operating profit margins. The data span a period of three years, from 2021 to 2023, and the financial information for each company is sourced from the Bloomberg database. The target companies are classified under “Package Software” and were further categorized into the following three groups based on the Nikkei classification:

- 28 companies providing enterprise management software (e.g., ERP, accounting software);
- 86 companies provide customized business software for specific industries.
- 10 companies providing general-purpose software for consumers.

These categories reflect the operational characteristics and types of software offered by companies and are expected to have varying effects on performance and profitability. Owing to missing data from 26 companies, missing values were imputed with averages to maintain statistical reliability.

Selection of independent variables: The following independent variables were chosen to evaluate the factors influencing operating profit margins:

1. **SG&A Ratio:** the ratio of SG&A expenses to total revenue. SG&A expenses include marketing and logistics costs, which reflect the costs associated with sales methods. The SG&A ratio is used as a measure of sales methods because effective channel strategy management is closely related to the efficient control of SG&A expenses. A reduction in the SG&A ratio is assumed to contribute to improved profit margins, and is used to test Hypothesis 1.
2. **Sales Growth to Gross Profit Growth Ratio:** the value obtained by dividing the sales growth rate by the gross profit growth rate. If gross profit does not increase proportionally with sales, it may indicate issues with cost management. This ratio is used to test Hypothesis 2.

3. **Revenue Efficiency Ratio:** a measure of earning capacity calculated by dividing total revenue by total costs. This ratio is used to test Hypothesis 3 by evaluating how efficiently companies generate revenue and its effect on operating profit margins.
4. **Analytical methods:** First, a simple regression analysis was conducted to individually assess the effect of each independent variable on operating profit margins. However, given that a simple regression analysis may not fully explain complex relationships, multiple regression analysis was adopted to build a model that accounted for the interactions between variables. The variance inflation factor (VIF) was calculated to eliminate the influence of multicollinearity. Since the VIF values for each independent variable were below 10, multicollinearity was not a concern.

4. RESULTS

To analyze the factors affecting the operating profit margins of software companies, descriptive statistics were first calculated to grasp the overall characteristics of the data (Table 1). This provided insight into the basic trends of the independent and dependent variables.

Next, multiple regression analysis was conducted to identify the factors influencing the operating profit margins of software companies. The results show that the model has a high level of fit with several explanatory variables having a significant effect on operating profit margins (Table 2).

The results of the multiple regression analysis show that the R-squared value is 0.894, indicating that the model explains approximately 89.4% of the variation in operating profit margins. Therefore, the independent variables (revenue efficiency ratio, SG&A ratio, and the ratio of sales growth to gross profit growth) explain operating profit margins with high accuracy. Additionally, the adjusted R-squared value is 0.892, almost the same as the R-squared value, confirming that the model does not include excessive explanatory variables and that the model fit is very high.

The F-statistic, which indicates the overall significance of the model, is 338.35, with a corresponding p-value of 0.000, demonstrating that the model is statistically significant. This confirms that at least one independent variable has a significant effect on operating profit margins. Furthermore, the Durbin-Watson statistic is 2.341, indicating virtually no autocorrelation in the residuals. Because a Durbin-Watson value close to two suggests no autocorrelation, it can be concluded that there are no issues with autocorrelation in this model. Table 3 presents the regression coefficients for each independent variable.

1. **SG&A Ratio:** The regression coefficient is -0.1363. This result indicates that a 1% increase in the SG&A ratio leads to a decrease in the operating profit margin of approximately 0.136%. As mentioned in the hypothesis, this reduction suggests that an increase in marketing and logistics costs reduces profits. In particular, the increase in SG&A expenses associated with sales channel strategies poses the

Table 1. Results of descriptive statistics

Variable	Observations	Mean	Std. Dev.	Min	0.25	0.50	0.75	Max
Operating Profit Margin (%)	124.00	9.38	19.36	-71.01	2.70	11.12	19.49	72.72
SG&A Ratio (%)	124.00	49.02	23.38	7.33	33.22	45.46	60.88	138.20
Sales Growth to Gross Profit Growth Ratio (%)	124.00	-11.90	177.68	-1904.45	-3.70	-1.20	2.60	469.89
Revenue Efficiency Ratio (%)	124.00	8.59	21.96	-100.76	0.21	10.50	19.89	73.27

Table 2. Results of multiple regression analysis

Indicator	Value
R-squared	0.8943
Adjusted R-squared	0.8916
F-statistic	338.3469
Prob (F-statistic)	2.3473E-58***
Durbin-Watson	2.341

Table 3. Details of regression coefficients

Model	Coefficient	Standard Error	t-value	p-value	Confidence Interval [0.025]	Confidence Interval [0.975]
SG&A Ratio	-0.1363	0.0314	-4.3368	0.000***	-0.1986	-0.0741
Sales Growth to Gross Profit Growth Ratio	0.0084	0.0033	2.5212	0.0130*	0.0018	0.0150
Revenue Efficiency Ratio	0.7166	0.0339	21.1403	0.0000***	0.6495	0.7838

direct risk of lowering profit margins if not properly managed.

2. Sales Growth to Gross Profit Growth Ratio:

The regression coefficient is 0.0084. A 1% increase in the ratio of sales growth to gross profit growth leads to a 0.0084% increase in operating profit margin. Although this variable has a positive effect, its influence is smaller than that of the other variables. This result aligns with Hypothesis 2, which suggests that “efficient cost management helps maintain gross profit margins,” especially indicating that the efficient management of outsourcing costs and development processes likely contributes to gross profit margins.

3. Revenue Efficiency Ratio:

The regression coefficient is 0.7166. A 1% increase in the revenue efficiency ratio results in a 0.7166% increase in operating profit margin. This result shows that revenue efficiency has a strong effect on operating profit margins, supporting Hypothesis 3,

which posits that improving revenue efficiency is the most important factor in enhancing corporate profit margins. This confirms that the optimal allocation of resources leads to improvements in revenue efficiency.

Additionally, a scatter plot of the predicted values versus the actual values (Figure 1) was created to assess the model’s prediction accuracy visually. The horizontal axis represents the actual operating profit margin, and the vertical axis represents the operating profit margin predicted by the regression model.

The red dashed line represents “Actual = Predicted,” and the closer the data points are to this line, the higher the model’s prediction accuracy. Since many data points cluster around this line, it can be said that the model has good overall predictive accuracy. However, some data points deviate from this line, suggesting that the model may either overestimate or underestimate the operating profit margins for these companies. Additional analyses are required to assess these outliers.

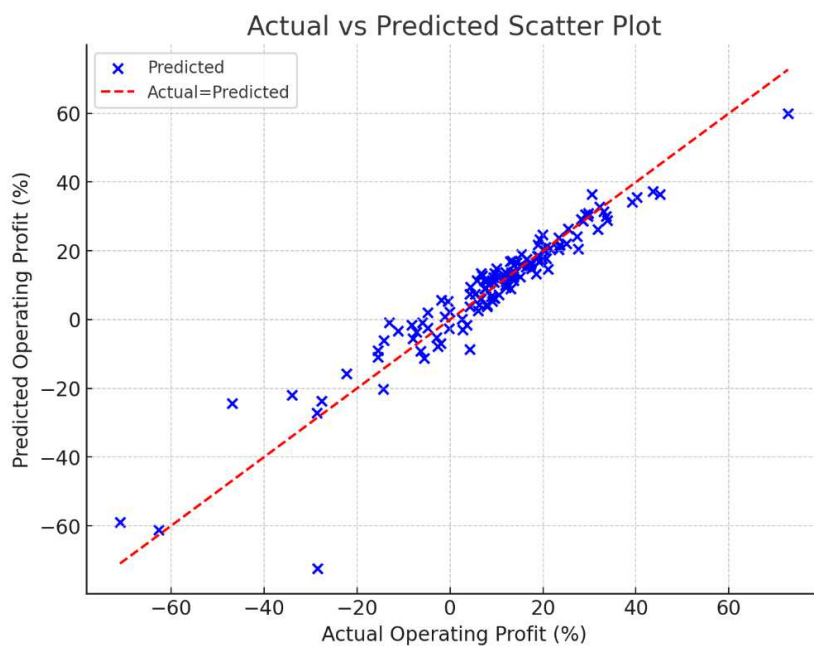


Figure 1. Predicted vs. actual operating profit margins

Overall, this model is highly effective in predicting operating profit margins given its high R-squared value, statistical significance, and lack of autocorrelation in the residuals. The analysis reveals that the revenue efficiency ratio has a strong positive effect on operating profit margins, suggesting that improving revenue efficiency plays a critical role in enhancing profit margins. Furthermore, as an increase in the SG&A ratio has a negative effect on operating profit margins, cost management has been confirmed as a key element of corporate strategies.

5. DISCUSSION

This study analyzes the factors affecting the operating profit margins of software companies and examines how sales methods, service management, and resource allocation influence corporate profitability. The results demonstrate that strategic decision-making is closely linked to improvements in operating profit margins. The Japanese software market relies heavily on foreign products, and domestic companies face challenges in optimizing their sales channels, operational efficiency, and resource allocation. However, in an increasingly competitive market, efficiently leveraging these factors may help companies to enhance their competitiveness and achieve sustainable profits.

Hypothesis 1 proposed that effective sales methods would contribute to improving profit margins. Multiple regression analysis confirms that the SG&A ratio is closely related to operating profit margins, highlighting the direct effect of sales methods on a company's cost structure. Specifically, optimizing sales channels and strengthening the cooperation between resellers and distributors can reduce costs and increase the efficiency of market approaches. For example, large domestic and international software companies have optimized their sales channels by reducing the number of sales partners and focusing on a few strategic partners, leading to cost reductions in marketing and logistics.

Kay (2003) argues that a company's success is based on its competitive advantage, and using an exclusive network (architecture) with resellers can strengthen this advantage. Teece (2010) also sup-

ports the idea that the evolution of business models is essential for the commercial success of technological innovations and that managing sales channels appropriately is the key to improving profits. Additionally, Tsay and Agrawal (2004) indicate that expanding direct sales channels while maintaining coordination with resellers allows both parties to benefit, showing that the strategic selection of multiple channels has a significant effect on profit margins.

Hypothesis 2 predicts that service and product management will significantly affect profits through cost efficiency. However, our analysis reveals that this effect is limited. While the t-value of 2.52 is statistically significant, the regression coefficient is small at 0.008, indicating that the effect on profits is less than expected. This suggests that companies may still make limited efforts to reduce the costs of product and service management. In the future, greater improvements in profit margins can be expected by focusing on areas such as R&D efficiency and reducing outsourcing costs.

Bachmann and Clements (2005) highlight the importance of managing variability in product-line management to improve service efficiency, and Ethiraj et al. (2005) point out that project management capabilities contribute to both efficiency and profit margin improvements. Linden et al. (2007) emphasize that product line engineering contributes to cost reduction, time savings, and quality improvements, suggesting that proper service management can affect profit margins positively.

Hypothesis 3 confirms that the revenue efficiency ratio influences operating profit margins significantly and that companies with high revenue efficiency optimize resource allocation to maximize profit margins. Levinthal and Wu (2010) discuss how resource allocation affects profit margins, noting that diversification strategies affect profit margins negatively but emphasizing the importance of appropriate resource allocation for profit improvement. Specifically, companies must carefully select business areas in which to focus on resources and concentrate on highly profitable sectors.

Mithas et al. (2012) demonstrate that IT investments contribute significantly to profits through

increased sales, supporting the idea that optimizing resource allocation improves profit margins. Wu et al. (2011) also note that resource allocation among SaaS providers helps reduce costs and maintain quality, confirming that efficient resource allocation plays a critical role in improving corporate profitability.

Overall, it was demonstrated that Japanese software companies could enhance their competitiveness and improve operating profit margins using optimized sales methods, efficient service management, and proper resource allocation. By strategically integrating these factors, companies can expect sustainable growth in both domestic and international markets.

CONCLUSION

This study yields the following key findings: First, the selection of sales methods and channel strategies contributes significantly to a company's operating profit margin. Companies that adopt indirect sales tend to improve their profit margins by optimizing sales costs through collaboration with resellers and distributors. This result indicates that sales methods affect a company's cost structure and profit margins directly.

Second, efficient management of products and services contributes to improved profit margins. The ratio of sales growth to gross profit growth has a significant effect on profit margins. Companies that manage product development and operational costs effectively are likely to achieve sustained profit growth. Companies with mature product lines are more likely to achieve higher profit margins through efficient cost management than through new development.

Third, optimizing revenue efficiency and resource allocation contributes strongly to improving operating profit margins. Companies with higher revenue efficiency tend to optimally utilize resources and strengthen their existing revenue streams, leading to sustainable profit margin growth. Specifically, companies that focus on updating and improving their existing products can maximize their profits while controlling their development costs.

However, this study has several limitations. First, the analysis was limited to specific company data, which may not fully reflect the impact of differences in industry, country, or company size, thereby limiting the generalizability of the results. Additionally, the evaluation of sales methods was limited to direct and indirect sales, and the diversity of channel strategies (such as online sales or partnership models) was not analyzed in detail. Moreover, although the overall effect of cost efficiency was evaluated, there was insufficient analysis of the specific elements involved.

Future studies should address these issues. First, the dataset should be expanded to include comparisons across industries, countries, and company sizes to draw more generalizable conclusions. Second, it is crucial to evaluate the diversity of channel strategies and their detailed effect on profit margins. Besides, beyond short-term profit margin analyses, studies should assess the long-term effects on competitiveness and sustainable growth. Furthermore, exploring how the spread of new technologies, such as AI and cloud computing, affects companies' revenue structures and sales methods will help clarify future strategic challenges.

The insights provided in this study are expected to serve as a foundation for domestic software companies to enhance their competitiveness in international markets and achieve sustainable growth. This study proposes strategies to help software companies adapt to the changing market environments they will face in the future and maintain their long-term competitiveness, thereby contributing to the development of the software industry.

Overall, this study sheds light on how sales methods, service management, and resource allocation affect operating profit margins, and offers valuable suggestions for incorporating these factors into future business strategies.

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