A Conceptual Review of Cost-Volume-Profit Analysis in the Context of Economic Uncertainty

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ARTICLE INFO	ABSTRACT
	This study explores how economic uncertainty affects managerial decision-making, especially in using Cost-Volume-Profit (CVP) analysis. Traditional CVP models assume stable prices, costs, and volumes, which are often unrealistic in today's volatile economy. Using a qualitative approach based on literature review, this research develops a conceptual framework for an adaptive CVP model. Sources include academic books, journals, and research reports, with a focus on both global and Indonesian contexts. Through content analysis, the study identifies key gaps in current CVP models and integrates deterministic, probabilistic, and adaptive approaches. The result is a three-layer conceptual model: (1) traditional CVP, (2) the impact of economic uncertainty, and (3) adaptive tools like sensitivity analysis, Monte Carlo simulation, scenario planning, and fuzzy logic. This model offers a more flexible and realistic CVP approach, especially useful for MSMEs facing market instability. The framework bridges traditional analysis with modern methods and is recommended for future testing using simulation tools to support decision-making in Indonesian MSMEs.

1. INTRODUCTION

In an era characterized by increasing economic volatility and complexity, managerial decision-making demands analytical frameworks that are not only

methodologically robust but also adaptable to rapidly shifting business conditions. Among the most widely utilized tools in managerial accounting is Cost-Volume-Profit (CVP) analysis, which elucidates the interdependencies among costs, sales volume, and profit. This model serves as a foundational instrument in supporting managerial decisions concerning pricing strategies, production planning, and profitability assessments.

Despite its widespread application, the conventional CVP model is predicated on a set of deterministic assumptions—namely, that the selling price per unit, variable cost per unit, and sales volume remain constant. Such assumptions simplify the model to a point where its practical relevance diminishes under real-world conditions, especially during periods of economic instability (Guo, 2022). In practice, firms are increasingly exposed to external shocks such as volatile raw material prices, fluctuating consumer demand, and disruptions in global supply chains. These factors introduce substantial uncertainty, rendering static models inadequate for effective strategic planning.

Recent macroeconomic developments have further underscored the urgency of this issue. Over the past two years, both global and national economies have been subjected to heightened uncertainty, driven by geopolitical conflicts, inflationary pressures, and post-pandemic market adjustments. These phenomena have introduced new layers of complexity into cost management and revenue forecasting, thereby amplifying the need for decision-making models that are both flexible and empirically grounded. CVP analysis, in its traditional form, is increasingly ill-suited to this evolving landscape.

A review of recent literature reveals a notable gap in the integration of environmental dynamics and risk considerations into the CVP framework. Existing studies predominantly maintain the static nature of the model, thereby limiting its applicability in contexts characterized by uncertainty and volatility (Bela de Sousa Delicado Teixeira et al., 2020). This evidences a critical research problem: the lack of an adaptive CVP model that can effectively accommodate the stochastic nature of modern business environments.

The present study seeks to address this gap by revisiting the foundational assumptions of CVP analysis and proposing a conceptual framework that incorporates dynamic variables and explicit risk factors. This research is guided by the following central question: How can the Cost-Volume-Profit analysis model be restructured to enhance its relevance and accuracy in conditions marked by uncertainty and change?

The contribution of this study is twofold. First, it offers a theoretical advancement by integrating adaptive modeling principles into the traditional CVP framework. Second, it provides practical implications for decision-makers seeking more resilient tools for strategic planning in uncertain environments. Drawing on recent empirical and conceptual advancements (Rahim, 2020), this paper introduces a novel, adaptive approach to CVP analysis that reflects the realities of contemporary business challenges. Accordingly, the study represents an original contribution to the literature on managerial decision-making under uncertainty and constitutes an important step toward the development of more relevant and applicable decision-support models.

2. LITERATURE REVIEW

Definition and Fundamental Concepts of Cost-Volume-Profit Analysis

According to Garrison, Noreen, and Brewer (2018), Cost-Volume-Profit (CVP) analysis is a fundamental managerial accounting tool designed to assist managers in understanding the relationships among cost structures, sales volume, and profitability within an organization. CVP analysis centers on five key elements: the selling price of the product, the level of activity or sales volume, the variable cost per unit, total fixed costs, and the sales mix or composition of products sold. By analyzing the interplay among these components, managers are better equipped to assess the financial implications of various business decisions on overall profitability.

CVP analysis plays a critical role in profit planning and managerial decision-making processes, including determining the break-even point, setting target profit levels, and evaluating the impact of changes in price, cost, and volume on earnings. One of the fundamental approaches in CVP involves calculating profit by multiplying the contribution margin per unit by the number of units sold and then subtracting total fixed costs from this amount. This framework illustrates that the greater the number of units sold, the higher the total contribution margin generated. However, profit is realized only after the total contribution margin exceeds the fixed costs incurred. In other words, a company begins to earn profit when the cumulative contribution margin surpasses its total fixed costs.

Economic Uncertainty: Concept and Its Impact on Financial Analysis

Economic uncertainty refers to a condition in which the direction and impact of economic variables cannot be predicted with certainty. This uncertainty may arise from a variety of external factors, including fluctuations in raw material and commodity prices, shifts in market demand, and dynamic monetary and fiscal policies (Khairiyah, Junaidi, n.d.). In addition, geopolitical tensions, changes in global regulatory frameworks, and other forms of

systemic risk further increase corporate exposure to uncertainty. Frank H. Knight (1921) made a clear distinction between risk and uncertainty—whereas risk can be measured using probabilistic methods, uncertainty is inherently unpredictable due to its uniqueness and the absence of prior occurrence. In the context of economic globalization, policies enacted in one country can have significant repercussions on business activities in other nations (Froot et al., 1993).

Such uncertainty has a considerable impact on the accuracy of financial forecasting, particularly in the use of analytical tools such as Cost-Volume-Profit (CVP) analysis. Traditional CVP models are grounded in a number of fixed assumptions, including stable selling prices, consistent fixed and variable costs, and a linear relationship between sales volume and profit (Garrison, Ray H., Noreen, Eric W, 2018). However, in an uncertain business environment, these assumptions often fail to reflect reality. Sudden changes in input costs or shifts in consumer purchasing power, for instance, can significantly alter contribution margins and break-even points that were previously calculated based on stable conditions (Rahmi et al., 2023).

Consequently, unexpected external shocks become major disruptors to the accuracy of conventional CVP analysis. When forecasts based on historical data no longer align with current conditions, managers are exposed to the risk of making suboptimal decisions. Therefore, a more flexible and adaptive CVP approach is required—one that not only incorporates deterministic data but also accommodates alternative scenarios and risk simulations in response to the increasing complexity of economic uncertainty (Froot et al., 1993; Garrison, Ray H., Noreen, Eric W, 2018).

The Application of CVP Analysis in a Stable Economic Context

In a relatively stable economic environment, Cost-Volume-Profit (CVP) analysis serves as a highly effective and reliable managerial tool for supporting decision-making processes and facilitating accurate profit planning. It enables managers to estimate the sales volume required to achieve a targeted level of profit while also determining the minimum sales threshold needed to avoid losses or to reach the break-even point (Dara Fitriawati et al., 2023; Luntungan & Tinangon, 2021). Economic stability enhances the predictability of cost and production volume data, thereby increasing the reliability and precision of CVP outcomes (Wahyuni, Jawoto Nusantoro, 2023).

Moreover, CVP analysis supports managerial decisions related to production strategies and pricing policies by clarifying the relationships among fixed costs, variable costs, selling prices, and sales volume. This understanding is essential for developing optimal production and pricing

strategies (Dara Fitriawati et al., 2023)(Rellam et al., 2025). Through CVP, firms are able to calculate the contribution margin—the difference between sales revenue and variable costs—for each product, which in turn aids in identifying the most profitable product lines (Luntungan & Tinangon, 2021).

Additionally, CVP facilitates the computation of the margin of safety, which indicates the extent to which sales can decline before the firm incurs a loss. This metric is critical for effective business risk management (Dara Fitriawati et al., 2023; Wahyuni, Jawoto Nusantoro, 2023). Another valuable insight provided by CVP analysis is the degree of operating leverage, which measures the sensitivity of a firm's operating income to changes in sales volume. In a stable economic setting, such analysis yields more accurate profit projections and supports both short-term and long-term financial planning (Luntungan & Tinangon, 2021).

Therefore, CVP analysis plays a pivotal role not only in profit and sales planning but also in cost optimization, pricing strategy formulation, and risk management. Given that CVP assumptions—such as the constancy of selling prices, fixed costs, and sales mix—are more likely to hold true under stable economic conditions, CVP remains a highly relevant and beneficial tool for corporate decision-making (Dara Fitriawati et al., 2023; Rellam et al., 2025).

Literature Synthesis and Research Gap

Previous studies have shown that the traditional Cost-Volume-Profit (CVP) model has been extensively utilized in relatively stable economic contexts. This model relies on a set of fixed assumptions, including constant selling prices, consistent fixed and variable costs, and a linear relationship between sales volume and profit. Under stable conditions, this approach proves effective in calculating the break-even point, contribution margin, margin of safety, and profit targets. As such, the conventional CVP model has served as a valuable tool for managerial decision-making and short-term financial planning (Dara Fitriawati et al., 2023; Garrison, Ray H., Noreen, Eric W, 2018; Luntungan & Tinangon, 2021).

However, in the context of heightened economic uncertainty, reliance on the traditional CVP model becomes increasingly limited. External fluctuations can significantly affect the key components of CVP calculations. To address this challenge, several studies—both at the international and national levels— have proposed risk- and probability-based approaches, such as sensitivity analysis, scenario analysis, Monte Carlo simulation, and fuzzy logic techniques (Hsiao et al., 2001; Liang et al., 2021; Pamungkas, 2017; Ronaldus Lahi et al., 2023; Said, 2016).

Economic uncertainties, including raw material price volatility, changes in consumer purchasing power, and dynamic fiscal policies, underscore the critical link between external conditions and the need to modify the CVP model. International studies suggest that deterministic approaches are no longer sufficient under such uncertain conditions. Instead, probabilistic and stochastic models are viewed as more representative for profit forecasting and risk-based decision-making. In contrast, research conducted in Indonesia remains predominantly reliant on deterministic methods. For instance, studies by Dara Fitriawati et al. (2023) and Luntungan and Tinangon (2021) continue to focus on classical tools such as break-even analysis and contribution margin, without integrating the complexities of an evolving economic landscape.

This divergence in methodological approaches reflects a significant research gap in the development and application of CVP models in Indonesia. While probabilistic methods have been widely adopted internationally to enhance CVP analysis, their application at the national level remains limited. Few domestic studies explicitly incorporate economic uncertainty into CVP modeling, particularly through simulation-based methods such as Monte Carlo simulation or fuzzy logic, which are capable of handling uncertain input variables.

In light of this, it can be concluded that a methodological and practical gap exists in the development of CVP models within the Indonesian research context. This limitation also represents a critical opportunity for future investigation. Upcoming studies should aim to develop CVP models that are more flexible and adaptive to economic uncertainty by integrating simulation-based, probabilistic, and fuzzy logic approaches. Doing so will not only enrich the national academic literature but also contribute meaningfully to improving the quality of managerial decision-making amid the rapidly changing business environment.

Table 1. Key Literature Review on Cost-Volume-Profit (CVP) Analysis and Economic Uncertainty

No	Author(s) & Year	Focus of Study	Method/Approach	Contribution to This Research
1	Garrison, Noreen, & Brewer (2018)	Fundamentals of traditional CVP analysis	Theoretical (accounting textbook)	Conceptual foundation for deterministic CVP model
2	Knight (1921)	Theory of risk vs. uncertainty distinction	Classical economic theory	Philosophical basis distinguishing measurable risk from uncertainty
3	Froot & Scharfstein (1993)	Globalization impact on business risk	Theoretical / macroeconomic	Explains global uncertainty exposure affecting firms
4	Liang et al. (2021)	Stochastic-based CVP model	Probabilistic simulation	Development of CVP using probabilistic input distributions
5	Lin & Wu (2001)	Decision-making using fuzzy logic approach	Fuzzy logic	Adaptive alternative for handling uncertain
6	Said (2016)	Sensitivity analysis using statistical distributions	Probabilistic & statistical	Profit risk evaluation using variable input distributions
7	Pamungkas(2017)	Monte Carlo simulation for SME financial analysis	Monte Carlo simulation	Application of stochastic approach in the Indonesian SME context
8	Lahi et al. (2023)	Monte Carlo-based Value at Risk (VaR) for stock investments	Monte Carlo simulation	Validation of risk-based approaches for investment scenarios
9	Dara Fitriawati & Fitriani (2023)	CVP application in MSMEs using classical approach	Deterministic	Representation of national studies using break-even and contribution margin
10	Luntungan & Tinangon (2021)	CVP use in profit planning	Descriptive conventional	National conventional study as comparison to adaptive CVP model

Source: Secondary Data Processed (2025)

3. METHODS

This study employs a qualitative research design using a conceptual literature review approach within the phenomenological tradition. The research aims to explore how traditional Cost-Volume-Profit (CVP) analysis can be adapted to uncertain economic environments through risk-based frameworks.

Data were collected through purposive sampling of secondary sources, including peer-reviewed journal articles, academic books, theses, and scientific

reports, accessed via databases such as Scopus, ScienceDirect, Google Scholar, and national academic repositories. Inclusion criteria focused on works discussing CVP analysis, economic uncertainty, risk analysis, and advanced techniques such as Monte Carlo simulation and fuzzy logic.

Analysis was conducted using content analysis, identifying key themes, methodological trends, and conceptual gaps. Findings informed the development of a three-layer conceptual model, integrating (1) basic CVP elements, (2) external uncertainty factors, and (3) adaptive managerial responses.

Although no hypotheses were tested, the study assumes that deterministic CVP models are inadequate in volatile contexts, and that incorporating probabilistic approaches improves decision-making. The methodology offers theoretical contributions to financial modeling and practical implications for strategic management under uncertainty.

4. RESULTS AND DISCUSSION

Challenges of the Conventional Cost-Volume-Profit (CVP) Model

The conventional Cost-Volume-Profit (CVP) model faces several fundamental challenges when applied in dynamic economic environments. One of its most significant limitations lies in its overly static assumptions. For instance, the model presumes that the selling price per unit remains constant, which is rarely the case in real-world business contexts where prices are subject to fluctuations due to competitive pressures, internal pricing strategies, or external factors such as inflation. Similarly, the model assumes fixed and variable costs remain unchanged, disregarding potential variations arising from operational efficiency, economies of scale, or input price volatility.

Another critical shortcoming is the model's inability to account for uncertainty in sales volume, which is often influenced by seasonal trends, consumer behavior, and market dynamics. Moreover, the assumption of a constant sales mix does not reflect the operational realities of multiproduct firms, which must frequently adjust their product composition in response to shifts in market demand. The conventional CVP model also overlooks external risks such as regulatory changes, economic instability, and supply chain disruptions—factors that can significantly affect profit projections.

Beyond the theoretical limitations, practical implementation of CVP analysis also encounters challenges, particularly among micro, small, and medium-sized enterprises (MSMEs). Many MSME business owners struggle to accurately classify costs as either fixed or variable, thereby undermining the

reliability of contribution margin and break-even point calculations. Furthermore, the traditional CVP framework lacks the capacity to capture real-time changes in consumer demand and raw material prices—critical elements in evaluating profit strategies.

The model's rigidity renders it insufficiently adaptive to changing business environments. Adjustments in selling prices or shifts in product mix directly impact the validity of break-even calculations, potentially leading to suboptimal decision-making. Additionally, the model does not incorporate semi-variable costs, which are prevalent in many operational settings. The inability of the CVP model to anticipate external shocks such as demand volatility, production disruptions, and innovation pressures further underscores the need for its modification and integration with more flexible and adaptive methodologies.

Given these limitations, particularly in uncertain economic conditions, the application of the conventional CVP model should be complemented with more robust analytical tools. Sensitivity analysis, scenario simulation, and probabilistic methods such as Monte Carlo simulation offer enhanced insights that better reflect the complexities of contemporary business environments. Such integration is essential for developing decision-making frameworks that are not only theoretically sound but also practically responsive to the realities of economic volatility.

CVP Model Adjustments Under Uncertainty

The conventional Cost-Volume-Profit (CVP) analysis model is a widely used tool in profit planning and managerial decision-making. However, its practical utility is fundamentally constrained when applied in business environments characterized by high levels of uncertainty. As market dynamics evolve and external variables grow increasingly complex, various studies have proposed modifications to the CVP model to enhance its adaptability. These modifications include the application of stochastic approaches, probabilistic simulations, and fuzzy logic-based models.

Stochastic CVP models incorporate uncertainty into key variables such as selling prices, variable costs, and demand levels. Rather than relying on a single deterministic estimate, this approach generates probability distributions of possible outcomes. Simulations allow managers to evaluate the likelihood of achieving break-even points or profit targets, thereby shifting decision-making toward a more risk-informed and opportunity-aware framework. In contexts where decisions are influenced by external uncertainties—such as commodity price volatility or exchange rate fluctuations—risk management strategies become essential. Researchers

emphasize the importance of hedging strategies to maintain contribution margin stability and support long-term investment sustainability.

Probabilistic CVP approaches utilize various probability distributions, including normal, lognormal, PERT, and Kumaraswamy distributions. These models, implemented through statistical software such as Excel or EasyFit, enable Monte Carlo simulations involving tens of thousands of scenarios. The results provide comprehensive statistical outputs, including expected values, standard deviations, and the probability of failing to reach the break-even point. Such analysis offers a more representative view of uncertain input variations and enhances the relevance of profit planning in data-driven decision environments.

Fuzzy logic-based CVP models offer another viable solution for handling uncertainty in business data. This approach replaces fixed values of variables—such as fixed costs, variable costs, and sales volume—with value intervals or membership functions. As a result, decision-making can incorporate optimistic, realistic, and pessimistic scenarios simultaneously. This flexibility strengthens the firm's responsiveness to unstable business conditions and improves the robustness of strategic planning.

Theoretically, adjustments to the CVP model can also be supported by Knight's (1921) classical distinction between measurable risk and immeasurable uncertainty. According to this view, in situations where variables cannot be statistically predicted, firms must combine quantitative approaches with adaptive managerial strategies—such as business diversification and scenario analysis—to enhance operational resilience and flexibility.

Based on this review, it is evident that CVP model adjustments under uncertainty should include the identification of relevant random variables, the application of probabilistic simulations (e.g., Monte Carlo), and the integration of fuzzy logic. Additionally, sensitivity analysis of key variables should complement the overall assessment. Technological support through statistical software becomes a critical enabler of these methods. Collectively, these adjustments render the CVP model more reflective of real-world business complexities and support more accurate, data-driven decision-making processes.

Literature Synthesis

The conventional Cost-Volume-Profit (CVP) model predominantly employs a deterministic approach based on a set of static assumptions, such as constant unit selling prices, fixed costs, variable costs, and sales volumes throughout the analysis period. This framework presents significant

limitations in capturing the dynamic nature of contemporary business environments, particularly due to its exclusion of uncertainty elements such as input price volatility, regulatory changes, market instability, and supply chain disruptions. In response to these limitations, international literature has increasingly advocated for the development of more adaptive CVP approaches. These approaches integrate probabilistic elements and fuzzy logic to enhance the model's accuracy in high-variability data environments.

This study synthesizes global theoretical perspectives with contextual analysis from Indonesia and finds that challenges in implementing CVP models arise not only from the rigidity of their underlying assumptions but also from practical limitations—particularly within the micro, small, and medium enterprise (MSME) sector. A key issue is the limited understanding among business owners regarding the distinction between fixed and variable costs, which critically affects the accuracy of contribution margin and break-even point calculations. Empirical observations in the MSME sector reveal a tendency to misclassify semi-variable costs as fixed costs, leading to suboptimal financial decision-making.

As a more adaptive alternative under conditions of uncertainty, CVP approaches based on Monte Carlo simulations and fuzzy logic offer enhanced analytical capabilities by employing probability distributions (e.g., normal, lognormal, or PERT) for key variables such as selling price, variable costs, and sales volume. These methods enable more informed managerial decisions by evaluating a range of potential scenarios and likelihoods of profit target attainment. Despite the growing adoption of such methods in international scholarship, their implementation in Indonesia—especially within MSMEs—remains limited. Domestic studies indicate that many MSME actors have yet to acquire sufficient analytical literacy or apply CVP analysis systematically. Moreover, cost accounting practices often remain conventional, lacking clear differentiation between fixed and variable costs, reflecting a low degree of adoption of uncertainty-based analytical models.

This condition highlights a significant gap between theoretical advancements in international literature and managerial practices within the national MSME sector. Accordingly, this study seeks to contribute conceptually by integrating classical CVP methodologies with modern, adaptive approaches, while also encouraging the adoption of risk-responsive managerial strategies in uncertain economic environments. From a practical standpoint, there is a pressing need to enhance analytical literacy among business owners, improve access to statistical software tools, and strengthen policy support to promote digital transformation in MSME financial analysis. The synthesis of theoretical foundations, empirical findings, and contextual insights presented in this study underscores the urgent need to reformulate CVP models to better reflect

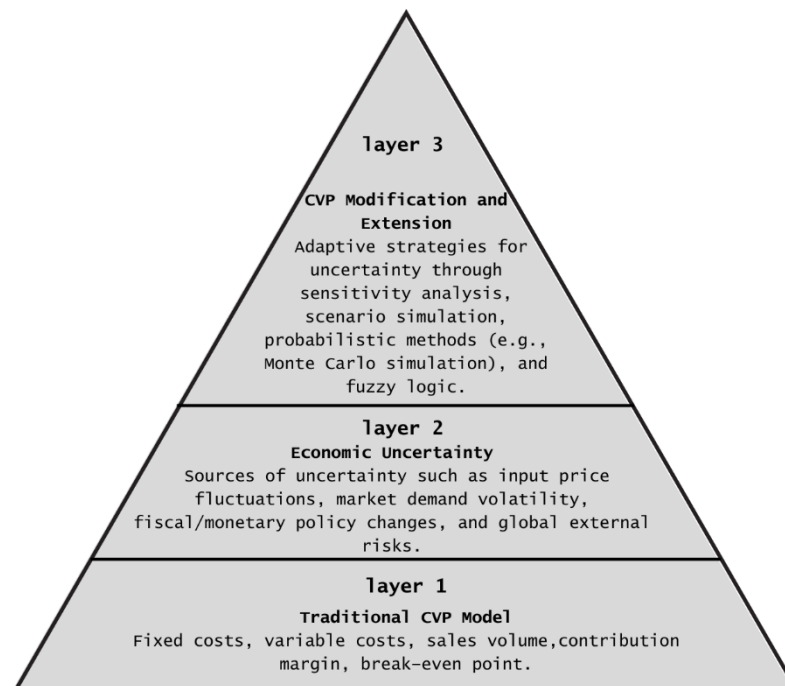business complexities and support data-driven decision-making in high-risk and rapidly evolving markets.

Figure 1. Three-Layer Conceptual Model of Cost-Volume-Profit (CVP) Analysis

Based on the synthesis of existing literature and a critical evaluation of the limitations inherent in the traditional Cost-Volume-Profit (CVP) model, this study proposes a three-layer conceptual framework designed to integrate core elements of CVP analysis with economic uncertainty. This model is structured hierarchically in the form of a pyramid, reflecting the foundational relationship between classical profit analysis and the fluctuating dynamics of modern economies. Each layer complements the others and is intended to assist managerial decision-makers in navigating unstable market environments.

The first layer represents the foundational structure of the traditional CVP model. This includes key components such as fixed costs, variable cost per unit, sales volume, contribution margin, and break-even point (Garrison, Ray H., Noreen, Eric W, 2018). The model employs a deterministic approach, assuming that all parameters remain constant in the short term. Due to its simplicity and ease of application, the classical CVP model remains widely used in short-term financial planning and profitability analysis. However, it demonstrates significant limitations when applied under volatile economic conditions.

The second layer addresses economic uncertainty, which directly challenges the validity of assumptions embedded within the conventional CVP

framework. Such uncertainty arises from various external factors, including raw material price volatility, shifts in market demand, fiscal and monetary policy changes, and global macroeconomic risks (Froot et al., 1993; Knight, 1921). Under such conditions, the deterministic outcomes produced by traditional CVP analysis become unreliable and potentially misleading, especially when used for strategic decision-making.

To overcome these limitations, the third layer introduces adaptive analytical approaches that enrich CVP analysis in uncertain economic environments. These include sensitivity analysis, which evaluates the impact of changes in a single variable on profitability; scenario analysis, which considers a range of possible market conditions (e.g., optimistic, realistic, and pessimistic); and Monte Carlo simulations, which generate probabilistic distributions of financial outcomes based on stochastic input variables (Liang et al., 2021; Said, 2016). The stochastic CVP model developed by Liang et al. (2021), for instance, produces profit distributions that facilitate risk-based decision-making rather than relying on single-point estimates.

Simulation-based methods have also been applied in the Indonesian context. Pamungkas (2017), for example, utilized Monte Carlo simulations to assess financial risks and profit probabilities in the small and medium manufacturing sector. While not explicitly framed within a CVP model, the approach aligns with the underlying principles of contribution margin and break-even analysis under risk. Similarly, Lahi et al. (2023) employed Monte Carlo simulations to calculate Value at Risk (VaR) in stock investment settings, highlighting the growing relevance of probabilistic models for capturing input-output uncertainty. These studies suggest a growing domestic interest in probability-based methodologies that could be further integrated into adaptive CVP models, particularly in sectors vulnerable to volatility.

Moreover, fuzzy logic offers a compelling alternative for cases where input data are imprecise or difficult to quantify. In a fuzzy logic framework, variables such as prices and costs are defined not as fixed values but as value ranges with associated degrees of membership. Lin and Wu (2001) demonstrated that this approach enhances the quality of decision-making, especially under conditions of limited information and unpredictable external variables. By combining these adaptive methodologies, the third layer of the proposed model provides a more realistic and responsive analytical framework for managing the complexity of modern economic environments.

Theoretically, this conceptual model signifies a paradigm shift from deterministic to probabilistic and flexible approaches that are better aligned with the realities of contemporary business practices. In the Indonesian context, much of the extant research still focuses on the application of

traditional CVP models, particularly in micro, small, and medium enterprises (MSMEs)(Dara Fitriawati et al., 2023)(Luntungan & Tinangon, 2021). Ironically, these sectors are among the most susceptible to external shocks and economic uncertainty. Therefore, this three-layer model contributes not only to the theoretical advancement of managerial finance literature but also offers a practical and adaptive framework to support more informed decision-making in uncertain environments.

5. CONCLUSION

This study highlights the limitations of the traditional Cost-Volume-Profit (CVP) model in addressing the complexities of an increasingly uncertain economic environment. Based on a synthesis of the literature, the deterministic assumptions underpinning classical CVP analysis are no longer sufficient for managerial decision-making, particularly in sectors highly exposed to external volatility, such as micro, small, and medium-sized enterprises (MSMEs). In such contexts, relying on static parameters may lead to misleading financial projections and suboptimal strategic choices.

To address these challenges, the study proposes a three-tiered conceptual model that reflects the evolution of CVP from a deterministic framework to a more adaptive and risk-informed analytical tool. The first tier represents the foundational elements of the traditional CVP model, including fixed costs, variable costs, sales volume, contribution margin, and break-even point. The second tier incorporates the influence of economic uncertainty—such as raw material price fluctuations, demand volatility, and shifting fiscal policies—which may compromise the validity of classical assumptions. The third tier introduces adaptive approaches such as sensitivity analysis, scenario analysis, Monte Carlo simulation, and fuzzy logic to integrate risk and uncertainty into CVP computations.

This model contributes not only to the theoretical expansion of financial management literature but also offers practical relevance by presenting a flexible and realistic decision-making framework. In the Indonesian context, where existing CVP studies largely rely on deterministic methods, the need for adaptive analysis is especially urgent for sectors like MSMEs that are highly vulnerable to economic disruptions.

Looking ahead, this conceptual model holds significant potential for empirical validation to assess its effectiveness in real-world scenarios. Future research may focus on MSME sectors—particularly food and beverage (F&B)—which are especially sensitive to external volatility. Simulations using software tools such as Excel or EasyFit can be employed to construct probabilistic distributions for key input variables, while fuzzy logic may be explored to

handle ambiguous or imprecise data. These developments would not only enhance the model's academic contribution but also provide practical, data-driven tools for responsive managerial decision-making.

In conclusion, the proposed three-layer CVP model is expected to enrich national financial management scholarship and encourage the adoption of more adaptive, context-sensitive CVP analyses in an era of global economic uncertainty.

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