

Analisis efisiensi ekonomi dan optimalisasi persediaan obat untuk program rujuk balik (PRB) di Apotek pada semester pertama tahun 2025

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Abstrak

Kebertahanan Program Rujukan Balik (PRB) sangat bergantung pada kemampuan finansial apotek mitra BPJS Kesehatan. Efisiensi ekonomi, yang tercermin pada selisih antara biaya klaim dan biaya pengadaan obat, merupakan indikator penting keberlanjutan operasional apotek dalam melayani pasien dengan penyakit kronis. Penelitian ini bertujuan untuk mengidentifikasi dan menganalisis tingkat efisiensi ekonomi pada PRB di apotek selama semester pertama 2025 (Januari–Juni) untuk optimalisasi manajemen persediaan. Studi ini menggunakan pendekatan deskriptif kuantitatif. Efisiensi ekonomi diukur dengan menganalisis margin bruto, yaitu selisih antara total biaya yang disetujui (klaim) oleh BPJS Kesehatan dan total harga pembelian obat dari pemasok. Analisis inventaris dilakukan menggunakan kombinasi metode ABC-VEN untuk memprioritaskan item obat berdasarkan nilai investasi dan urgensi klinis. Data klaim dan pembelian dianalisis setiap bulanan secara berkala. Analisis data menunjukkan bahwa margin kotor rata-rata yang dicapai apotek selama semester pertama adalah 8,0%. Fluktuasi margin bulanan yang signifikan diamati, dengan margin terendah tercatat pada bulan Februari (5,2%) dan margin tertinggi pada bulan Juni (12,1%). Analisis ABC menunjukkan bahwa 4 dari 19 item obat (21%) menyerap 81% dari total anggaran pengadaan. Analisis ABC-VEN mengidentifikasi 4 item obat dalam kategori AV (Vital, High Value) sebagai prioritas utama untuk pengendalian. Implementasi PRB di apotek menunjukkan tingkat efisiensi ekonomi yang positif dan berkelanjutan. Namun, variabilitas margin antar bulan dan nilai investasi pada beberapa item obat menunjukkan adanya peluang untuk optimasi melalui strategi pengadaan berbasis data ABC-VEN dan negosiasi harga pada item Kategori A untuk mencapai profit yang lebih stabil.

Kata Kunci: Program rujukan; Margin kotor; Analisis ABC-Ven; Asuransi kesehatan BPJS; Manajemen persediaan apotek

Analysis of economic efficiency and optimization of drug supplies for the referral back program (PRB) in pharmacies for the first semester of 2025

Abstract

The sustainability of the Referral Back Program (PRB) is highly dependent on the financial viability of BPJS Kesehatan partner pharmacies. Economic efficiency, reflected in the margin between claim costs and drug procurement costs, is a crucial indicator for the operational sustainability of pharmacies in serving patients with chronic diseases. This study aims to analyze the level of economic efficiency of PRB implementation in pharmacies during the first semester of 2025 (January–June) and identify areas for inventory management optimization. This study uses a quantitative descriptive approach. Economic efficiency is measured by analyzing the gross margin, which is the difference between the total costs approved (claims) by BPJS Kesehatan and the total purchase price of drugs from suppliers. Inventory analysis is performed using a combination of ABC-VEN methods to prioritize drug items based on investment value and clinical urgency. Claim and purchase data were analyzed monthly and in aggregate. Data analysis showed that the average gross margin achieved by pharmacies during Semester I was 8.0%. Significant monthly margin fluctuations were found, with the lowest margin recorded in February (5.2%) and the highest margin in June (12.1%). ABC analysis showed that 4 of 19 drug items (21%) absorbed 81% of the total procurement budget. ABC-VEN analysis identified 4 drug items in the AV (Vital, High Value) category as the top priority for control. The implementation of PRB in pharmacies shows a positive and sustainable level of economic efficiency. However, the variability of margins between months and the concentration of investment value in several drug items indicate room for optimization through ABC-VEN data-based procurement strategies and price negotiations on Category A items to achieve more stable profitability.

Keywords: Referral program; Gross margin; ABC-Ven analysis; BPJS Health insurance; Pharmacy inventory management.



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1. Introduction

The National Health Insurance (JKN) system, administered by the Social Security Administration Agency (BPJS Kesehatan), has become the backbone of healthcare services in Indonesia. One innovative program within the JKN framework is the Reverse Referral Program (PRB). This program is designed to improve healthcare efficiency by diverting treatment for patients with stable chronic diseases from Advanced Referral Health Facilities (FKRTL) back to Primary Healthcare Facilities (FKTP) (Kementerian Kesehatan, 2024). Its primary goal is to reduce hospital queues, bring healthcare closer to patients, and ensure the continuity of effective long-term therapy.

Within the PRB ecosystem, pharmacies play a crucial role as the final point of medication distribution to patients. Efficient pharmaceutical logistics management is a key determinant of both the financial sustainability of pharmacies and the quality of care provided to JKN participants. This efficiency directly impacts pharmacies' ability to ensure the availability of essential medications, minimize storage costs, and avoid losses due to expired medications.

Despite the national implementation of the PRB program, pharmacies continue to face operational challenges, including fluctuating drug demand, inefficient budget allocation, shortages of clinically important medications, and excess stock that unnecessarily ties up working capital. These challenges indicate that procurement decisions are still largely based on historical consumption patterns rather than integrating economic value and clinical priorities into inventory planning. These inefficiencies can disrupt continuity of care for patients with chronic diseases while reducing pharmacy operational performance and financial sustainability (Mousazadeh et al., 2023; Sefah et al., 2021).

To measure and improve efficiency, quantitative analysis methods such as the ABC-VEN (Vital, Essential, Non-essential) analysis have gained widespread recognition (Quick et al., 2012). ABC analysis, or Pareto analysis, classifies drug items based on their contribution to the total investment value, with a small subset of items (Group A) absorbing the majority of the budget.

Therefore, this study aims to provide evidence-based recommendations for improving pharmaceutical inventory management in PRB programs through the implementation of an integrated ABC-VEN approach. Unlike previous studies in Indonesia that primarily focused on inventory classification or drug availability separately, this study combines ABC-VEN inventory prioritization with item-level gross margin profiles to evaluate the clinical and economic dimensions of drug procurement. This integrated framework offers a more comprehensive decision-support model to optimize procurement strategies, improve working capital allocation, strengthen drug availability, and support the long-term sustainability of Indonesia's National Health Insurance system. Based on preliminary data analysis, the main problems faced are the potential for suboptimal budget allocation due to fluctuations in demand, the risk of stockouts of vital drugs, and the threat of overstocking that ties up working capital. Therefore, this research is urgently needed to provide evidence-based recommendations to ensure drug availability, maintain the financial sustainability of pharmacies, and contribute to the overall effectiveness of the JKN system. In addition, this study provides a novel, integrated application of ABC-VEN analysis and item-level margin profiling specifically within the BPJS Kesehatan Referral Back Program (PRB) pharmacy setting, which has not been comprehensively reported in previous Indonesian studies.

2. Method

This study uses a descriptive design with a quantitative approach to provide a systematic description of the level of financial efficiency and PRB drug management in pharmacies. The study was conducted at one BPJS Kesehatan partner pharmacy (Pharmacy X) that serves PRB patients in Sleman Regency, Yogyakarta. The data used is secondary data from the PRB drug claim recapitulation report for the period January to June 2025. Data collection used the total sampling method, in which all monthly data related to PRB claims during that period were analyzed. The variables in this study were operationally defined as follows:

1. BPJS Approved Costs: The total value of PRB drug claims in Rupiah (Rp) that have been verified and approved for payment by BPJS Kesehatan to pharmacies each month.
2. Supplier Purchase Price: This is the total acquisition cost or purchase price of all PRB drugs in Rupiah (Rp) from official pharmaceutical distributors according to the purchase invoice for each month.
3. Value Difference (Gross Margin): This is the absolute difference in Rupiah (Rp) between the total BPJS Approved Costs and the total Supplier Purchase Price in one month. In equation 1 This variable indicates the gross profit earned by pharmacies from PRB drug services.

$$\text{Difference (Rp)} = \text{BPJS approved cost} - \text{Supplier Purchase Price} \quad (1)$$

4. Efficiency Margin in equation 2 is the percentage ratio between the Value Difference and the BPJS Agreed Cost. This variable is the main indicator for measuring the financial efficiency of PRB drug management. A higher margin value indicates better efficiency.

$$\text{Efficiency Margin (\%)} = \left(\frac{\text{Value Difference}}{\text{BPJS Agreed Cost}} \right) \times 100\% \quad (2)$$

Data analysis was performed using descriptive quantitative methods in Microsoft Excel, including data tabulation, variable calculations, ABC-VEN analysis, and presentation of results in tables and graphs for interpretation.

3. Result and Discussion

During the first semester of 2025, the total value of approved claims reached IDR 5,144,209,682, with a total cost of goods sold (COGS) of IDR 4,741,348,694. This resulted in a total gross margin of IDR 402,860,988. The average gross margin achieved was 8.0%. Details of the monthly margin are presented in **Table 1**.

Table 1. PRB drug service gross margin analysis (January – June 2025).

No.	Month	Approved Claim Value (IDR)	Cost of Goods Sold (COGS) (IDR)	Gross Margin (IDR)	Gross Margin (%)
1.	January	851.693.300	794.750.000	56.943.300	6,7%
2.	February	986.729.957	935.450.000	51.279.957	5,2%
3.	March	1.058.460.675	967.894.750	90.565.925	8,6%
4.	April	824.996.250	765.432.100	59.564.150	7,2%
5.	May	711.161.737	652.543.211	58.618.526	8,2%
6.	June	711.167.763	625.278.633	85.889.130	12,1%
Total Semester I		5.144.209.682	4.741.348.694	402.860.988	-
Average per Month		-	-	-	8,0%

Source :Researcher-Processed Data, 2025

Monthly Gross Margin Fluctuations in the Referral Program (PRB) for Semester I 2025 **Figure 1**. The graph in shows significant fluctuations in gross margin. The lowest efficiency rate was recorded in February (5.2%), while the highest efficiency rate was achieved in June (12.1%). This considerable variability indicates that there are dynamic factors affecting the profitability of PRB services over time.

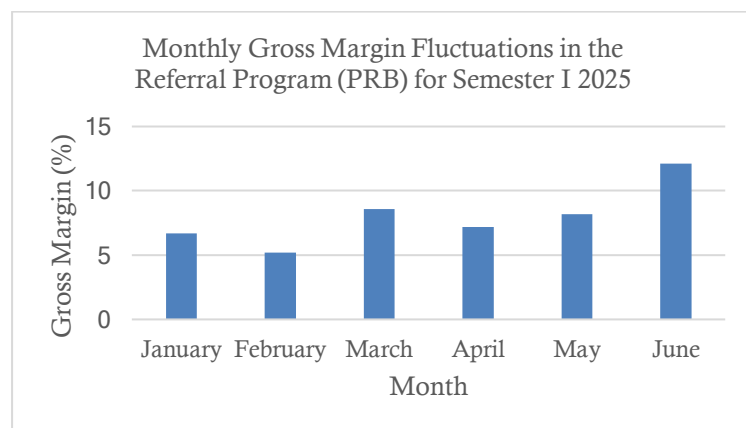


Figure 1. Graph of Monthly Gross Margin Fluctuations in the Referral Program (PRB) for Semester I 2025

Source :Researcher-Processed Data, 2025

ABC analysis was conducted on the total number of drug items in the Referral Back Program (PRB) procured by pharmacies during the study period. **Table 2** is analysis classified drug items based on their contribution to the total investment value (procurement costs in).

Table 2. Classification of PRB drug items based on investment value (ABC Analysis)

Category	Number of Drug Items	Percentage of Items (%)	Total Investment Value (HPP) (Rp)	Percentage of Cumulative Value (%)	Control Priority
A	4	21%	3.840.111.957	81,0%	Very High
B	4	21%	663.788.775	14,0%	Medium
C	11	58%	237.447.962	5,0%	Low
Total	19	100%	4.741.348.694	100%	

Source : Researcher-Processed Data, 2025

VEN analysis classifies all PRB drug items based on their medical urgency to ensure the safety and continuity of therapy for chronic patients with percentage results in [Tabel 3](#).

Tabel 3. Percentage of medication items by VEN category

VEN Group	Criticality Category	Percentage of Items (%)
V	Vital (Life-saving/Critical)	45%
E	Essential (Important, Not Urgent)	40%
N	Non-Essential (Supporting/Less Important)	15%
Total		100%

Source : Researcher-Processed Data, 2025

The classification results show that the Return Referral Program drugs are dominated by Vital (V) and Essential (E) items, which collectively account for 85% of all items. The chronic nature of PRB diseases (DM, Hypertension) justifies the high percentage of Vital and Essential drugs. Non-Essential (N) items, which account for around 15%, are generally supportive medications or vitamins. Key Findings and Economic Efficiency Levels (ABC-VEN Combination Matrix).

Furthermore, a pattern indicating structural inefficiency is found in [Tabel 4](#): Category I items experience underinvestment and stock shortages, and Category III items consume a disproportionate amount of working capital without significantly contributing to service sustainability, highlighting the absence of a differentiated procurement strategy based on the ABC-VEN matrix.

Tabel 4. ABC-VEN combination matrix for PRB drug procurement in semester I 2025

Control Priorities	Combination Matrix	Control Focus	Key Inefficiency Findings (Based on Initial Observations)
Category I (Absolute Priority)	AV, AE, BV	Strict control, zero risk of stockouts.	Critical items such as Amlodipine 10 mg and Metformin 500 mg (classified as AV/AE) experienced recurrent stockouts averaging 3–5 days per month, leading to treatment interruptions for chronic patients and forcing pharmacies to resort to emergency purchases at higher prices.
Category III (Potential Inefficiency)	AN, BN, CN	Procurement Review, High risk of dead stock.	Approximately 12% of total PRB items were identified as slow-moving (turnover < 1 time per month), predominantly in Categories C and N, resulting in excess inventory, higher holding costs, and an increased risk of financial losses due to expired or obsolete stock

Source : Researcher-Processed Data, 2025

Key Findings on Efficiency Levels: The economic efficiency of Pharmacy X was identified as suboptimal due to Failure to Prioritize Critical Items: Significant stock shortages of Category I (AV/AE) items such as Amlodipine and Metformin. These shortages occurred because procurement funding allocation was not optimal and did not focus on priority items. Wasteful Storage Costs: Stockpiling of slow-moving items (12% of items) indicates unnecessary holding costs, which erode the pharmacy's profitability.

The analysis of margins per item ([Tabel 5](#)) reveals two key findings. First, the top four items (insulin and Clopidogrel) account for 60.5% of the total gross margin, despite their relatively low margin percentages (5.8% - 6.5%). Second, generic drugs such as Glimepiride and Furosemide show very high margin percentages (above 25%), acting as the pharmacy's "efficiency engines."

Tabel 5. Gross Margin Rankings per PRB Drug Item (January – June 2025)

Rank	Drug Name	Total Margin (Rp)	Margin Percentage (%)
1	Prandial Insulin Analog, insulin aspart inj100 IU/mL, Penfill	131.259.020	5,9%
2	Basal Insulin Analog, insulin glargine inj 100 IU/mL	68.364.950	6,0%
3	Clopidogrel tab 75 mg	23.053.000	5,8%
4	Mixed Insulin Analog, insulin combination	21.012.305	6,5%
5	Amlodipine 10 mg tab	19.895.800	18,3%
6	Bisoprolol 5 mg tab	19.340.250	17,9%
7	Valsartan 160 mg tab	18.363.500	18,7%
8	Metformin 500 mg tab	15.656.700	19,8%
9	Simvastatin 20 mg tab	13.064.000	17,2%
10	Glimepiride 2 mg tab	11.758.500	25,2%
11	Amlodipine 5 mg tab	10.372.500	18,5%
12	Candesartan 8 mg tab	9.079.200	18,9%
13	Furosemide 40 mg tab	6.777.600	25,6%

Rank	Drug Name	TotSSal Margin (Rp)	Margin Percentage (%)
14	Allopurinol 100 mg tab	6.452.813	19,1%
15	Glibenclamide 5 mg tab	5.340.000	25,2%
16	Glimepiride 1 mg tab	4.960.500	25,2%
17	Spironolactone 25 mg tab	4.887.000	16,3%
18	Valsartan 80 mg tab	2.172.350	14,2%
19	Candesartan 16 mg tab	1.051.000	18,7%
	Total Margin	402.860.988	Average: 8,0%

Source : Researcher-Processed Data, 2025

The results of the study show that pharmacies successfully implemented PRB with positive economic efficiency, as evidenced by an average gross margin of 8.0%. This level indicates that the program is financially viable and sustainable for pharmacies. However, significant monthly margin fluctuations, from 5.2% in February to 12.1% in June, indicate room for optimization. This variability may be influenced by purchasing strategies, changes in prescription composition, or price adjustments from suppliers.

The simultaneous occurrence of stockouts and overstocking indicates that procurement planning for PRB medicines remains largely demand-driven and reactive, relying predominantly on historical consumption data without adequately considering the clinical criticality and economic value of medicines. Such procurement practices may increase inventory carrying costs, reduce medicine availability, and contribute to medicine wastage due to expiration. Similar challenges have been reported in pharmaceutical supply chain studies, which emphasize that fragmented information systems, inadequate demand forecasting, and limited coordination among healthcare providers are major determinants of inventory inefficiency (USAID, 2013; World Health Organization, 2024). Within the Indonesian National Health Insurance system, stronger integration of information systems among BPJS Kesehatan, Primary Health Facilities (FKTP), referral hospitals (FKRTL), and partner pharmacies is therefore essential to improve forecasting accuracy, reduce stock imbalances, and ensure uninterrupted access to medicines for chronic disease patients (BPJS, 2024; Kementerian Kesehatan, 2024).

Therefore, these findings have several important implications for pharmaceutical inventory management within the BPJS Kesehatan Referral Back Program (PRB). First, strengthening evidence-based decision-making is essential by routinely implementing the integrated ABC–VEN matrix as the primary framework for medicine procurement and inventory prioritization. This approach enables pharmacies to allocate financial resources according to both the economic value and clinical criticality of medicines, thereby improving inventory efficiency and ensuring the availability of essential therapies (Clark, 2012; World Health Organization, 2024).

Second, the adoption of quantitative inventory control methods should be prioritized for Category I medicines (AV and AE), which represent high-value and clinically critical items. Inventory management techniques such as the Economic Order Quantity (EOQ), Reorder Point (ROP), and safety stock calculations have been demonstrated to reduce stockout risk while minimizing inventory holding costs and procurement inefficiencies in healthcare supply chains (Mousazadeh et al., 2023; Teli et al., 2022; USAID, 2013).

Third, working capital optimization should focus on reducing excessive investment in Category III medicines (CN), which generally have lower clinical priority and economic impact. Procurement strategies such as tighter purchasing controls, periodic inventory reviews, and Just-in-Time (JIT) inventory policies can release financial resources that may subsequently be reallocated to high-priority medicines, thereby improving cash flow and ensuring uninterrupted medicine availability (Clark, 2012; WHO, 2020).

Overall, this study demonstrates that improving the economic efficiency of PRB medicine procurement is imperative for both pharmaceutical service quality and the financial sustainability of participating pharmacies. Failure to optimize inventory management may increase the frequency of stockouts, medicine expiration, and unnecessary inventory costs, ultimately compromising continuity of care for patients with chronic diseases enrolled in the National Health Insurance (JKN) program. Conversely, an integrated inventory management strategy combining ABC–VEN analysis with quantitative forecasting methods can strengthen medicine availability, improve resource utilization, and support the long-term sustainability of the PRB program (BPJS, 2024; Kementerian Kesehatan, 2023; World Health Organization, 2024).

4. Conclusion

This study concludes that the implementation of the Referral Back Program (PRB) at Pharmacy X remains economically efficient, with an average gross margin of 8.0% during Semester I 2025, but is undermined by logistical imbalances, namely recurrent stockouts of vital AV/AE items and overstocking of approximately 12% slow-moving C/N items. The application of the ABC–VEN matrix combined with

item-level margin analysis highlights the need for a more rigorous, data-driven procurement strategy to secure the availability of critical drugs while maintaining the financial sustainability of BPJS Kesehatan partner pharmacies.

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