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Business and Policy Strategies in Rice Import Management: Lessons from Indonesia

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ABSTRACT

Rice imports are a critical element of Indonesia's food security strategy, but prior research has predominantly addressed the economic determinants of import demand, with limited attention to the government's strategic management role. This study examines the effects of domestic rice production, international rice prices, the exchange rate, and population on Indonesia's rice imports from Thailand and Vietnam in 2004–2023, and analyzes the business and policy strategies the government uses to maintain national food security. Using a convergent mixed-methods design, the study combines a panel regression of annual data (40 observations) with semi-structured interviews with officials of the Ministry of Trade and Perum BULOG. The exchange rate ($\beta = -0.315$, $p = 0.003$) and population ($\beta = 49.580$, $p = 0.003$) significantly affect rice import volumes, whereas domestic production and international prices are not individually significant; the model explains a modest share of the variation (adjusted $R^2 = 0.156$). The qualitative findings show that rice import management extends beyond economic factors and operates through three complementary government roles. As a facilitator, the government coordinates procurement, licensing, logistics, and food reserves; as a regulator, it oversees import quotas, quality standards, tariffs, and compliance; and as a catalyst, it strengthens institutional coordination and long-term food security. Rice import decisions are therefore shaped by both market dynamics and institutional capacity, and the study offers an integrated framework for strategic rice import management.

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Introduction

Rice is a critical food commodity and the primary staple in Indonesia, and ensuring sufficient rice supplies is a fundamental government responsibility. Domestic production frequently

falls short because of variable weather, declining productivity, land conversion, and population growth. Consequently, Indonesia has relied on rice imports, mainly from Thailand and Vietnam, to maintain food availability and stabilize prices. Import volumes were particularly high in 2011 (2.75 million tons), 2018 (2.25 million tons), and 2023 (more than 3.0 million tons); in 2023, imports from Thailand reached approximately 1.40 million tons and those from Vietnam 1.15 million tons (UN Comtrade, 2025).

Rice imports have become a central component of Indonesia's national food strategy rather than a temporary response to production shortfalls. From a business perspective, import decisions involve more than financial considerations: the government must determine purchase timing, select suppliers, manage stock levels, maintain emergency reserves, and respond to changing domestic and global conditions. Effective rice import management therefore depends not only on market dynamics but also on the government's capacity to develop and implement sound business and policy strategies. Previous research has mainly examined the effects of domestic production (Anggraeni et al., 2023; Permatasari, 2020; Prinadi et al., 2016), international prices (Karuniatama & Purwiyanta, 2023; Prinadi et al., 2016), exchange rates (Putra et al., 2019; Salsabil & Sri S., 2023; Wiseman et al., 2021), and population (Oktaviana et al., 2023; Permatasari, 2020) on rice imports. While these economic factors clarify important aspects of import demand, they offer only a partial view of the strategic policy processes that guide government decisions. In reality, import volumes are also influenced by institutional factors, including food reserve management, import regulations, bilateral trade agreements, market stabilization policies, and national food safety priorities. Wiseman et al. (2021), for example, found that the state trading enterprises that control rice imports in Southeast Asia do not respond to exchange rate fluctuations in the profit-maximizing way predicted by economic theory.

This study aims to (1) assess the effects of domestic production, international prices, the exchange rate, and population on Indonesia's rice imports from Thailand and Vietnam in 2004–2023; (2) analyze the business and policy strategies used by the Indonesian government to manage rice imports and ensure food security; and (3) provide integrated insights into strategic rice import management by combining quantitative analysis with qualitative evidence from policymakers. The conceptual framework combines import demand theory with the perspective of government intervention. Import demand theory highlights the influence of domestic production, international prices, exchange rates, and population, reflecting the interplay between domestic supply and external market forces. Government intervention may take the form of a regulator, which establishes trade regulations and import mechanisms; a facilitator, which ensures market access, coordinates stakeholders, and maintains food reserves; or a catalyst, which supports long-term food security, market stability, and supply chain resilience (Nurdin et al., 2014). This study contributes to the business and management literature by examining both the factors that influence imports and how the government strategically manages them: the quantitative panel analysis identifies economic drivers, while the qualitative interviews reveal managerial and policy strategies.

Method

Research Design

This study adopts a convergent mixed-methods design (Creswell & Plano Clark, 2018) to investigate the business and policy strategies underlying Indonesia's rice import management. The quantitative analysis identifies the economic determinants of rice imports, while the qualitative analysis examines how government institutions formulate and implement business

and policy strategies to maintain food security and market stability. Integrating the two approaches provides a more comprehensive explanation of rice import management than either type of evidence alone.

Data Sources

Annual panel data covering Thailand and Vietnam from 2004 to 2023 were used for the quantitative analysis, giving 40 observations. Secondary data were collected from official sources: the United Nations Comtrade Database for rice import volumes, the Food and Agriculture Organization (FAO) for international rice prices, the World Bank and Bank Indonesia for exchange rates, and Statistics Indonesia (BPS) for domestic rice production and population. For the qualitative analysis, semi-structured interviews were conducted with representatives of the Ministry of Trade and Perum BULOG, who were purposively selected because of their direct involvement in food import policy, rice procurement, and strategic food stock management.

Quantitative Analysis

A panel regression was estimated to examine the economic determinants of Indonesia's rice imports from Thailand and Vietnam. Panel data combine cross-sectional observations of exporting countries with annual time series, which allows unobserved heterogeneity across countries to be tested and controlled (Baltagi, 2021). The dependent variable is the annual volume of Indonesia's rice imports from each country. The independent variables are domestic rice production (tons), the international rice price (USD), the rupiah to US dollar exchange rate (IDR/USD), and the Indonesian population. The model is

$$Y_{it} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + e_{it}, \tag{1}$$

where Y_{it} is the volume of Indonesian rice imports from country i (Thailand or Vietnam) in year t (2004–2023); X_1 is domestic rice production; X_2 is the international rice price; X_3 is the exchange rate; X_4 is the population; β_0 is the constant; β_1–β_4 are regression coefficients; and e_{it} is the error term. Because the independent variables describe Indonesia or the world market, they take the same value for both exporting countries in a given year, which is why they carry only the subscript t.

The estimator was selected using the Chow test and the Breusch–Pagan Lagrange multiplier test. Diagnostic tests for multicollinearity, heteroscedasticity, normality, and autocorrelation were then conducted. All quantitative analyses were performed in EViews 12.

Qualitative Analysis

The interview data were analyzed through thematic analysis (Braun & Clarke, 2006). Interview transcripts were systematically coded to identify recurring themes in government strategies for rice import management. In line with the conceptual framework, coding focused on three complementary government roles (regulator, facilitator, and catalyst), while also allowing emerging themes to be identified. The themes were then interpreted alongside the quantitative findings to explain not only the economic determinants of rice imports but also the strategic considerations that guide government decision-making.

Research Validity

Validity was supported through methodological triangulation of quantitative and qualitative evidence. Diagnostic tests were used to assess the econometric model, and qualitative findings

were corroborated through data triangulation across informants from different government institutions responsible for rice import management.

Results

Economic Determinants of Indonesia's Rice Imports

The Chow test did not reject the null hypothesis, indicating that the common effect model (CEM) is appropriate, and the Breusch–Pagan Lagrange multiplier test also supported the CEM. Table 1 shows the correlation matrix of the independent variables. Most correlations are weak to moderate, but the correlation between the exchange rate and population is 0.933. The variance inflation factors implied by this correlation matrix are 1.39 for domestic production, 2.97 for the international price, 13.82 for the exchange rate, and 18.14 for population, so the exchange rate and population are strongly collinear (VIF > 10). Under imperfect multicollinearity the OLS estimator remains unbiased and best linear unbiased, but the coefficients of the collinear variables are estimated with less precision and their individual signs and magnitudes must be interpreted with caution (Gujarati & Porter, 2009).

Table 1. Correlation Matrix of the Independent Variables

Variable	X_1	X_2	X_3	X_4
Domestic rice production (X_1)	1.000	-0.004	-0.416	-0.269
International rice price (X_2)	-0.004	1.000	0.511	0.705
Exchange rate (X_3)	-0.416	0.511	1.000	0.933
Population (X_4)	-0.269	0.705	0.933	1.000

Source: processed data (2025).

The Jarque–Bera test yielded a p-value of 0.102, indicating that the residuals are approximately normally distributed. In the heteroscedasticity test, the p-values for domestic rice production (0.303), the international rice price (0.695), the exchange rate (0.762), and population (0.486) all exceed 0.05, so heteroscedasticity is not detected. The Durbin–Watson statistic is 1.867; with 40 observations and four independent variables, $d_L = 1.284$ and $d_U = 1.720$, so $4 - d_U = 2.280$ and $4 - d_L = 2.716$. Because $1.720 < 1.867 < 2.280$, significant first-order autocorrelation is not detected.

Table 2. Results of the Panel Data Regression (Common Effect Model)

Variable	Coefficient	t-statistic	Prob.
Constant	$-7{,}593.861$	-2.887	0.007
Domestic rice production	-11.838	-0.819	0.418
International rice price	-1.252	-1.551	0.130
Exchange rate	-0.315	-3.215	0.003
Population	49.580	3.161	0.003
R^2	0.243		
Adjusted R^2	0.156		
F-statistic (Prob.)	2.802 (0.041)		
F-table / t-table ($\alpha = 0.05$)	2.641 / 2.030		

Source: processed data (2025).

The regression model is statistically significant ($F = 2.802$, $p = 0.041$), indicating that the

selected economic variables jointly explain part of the variation in Indonesia's rice imports from Thailand and Vietnam. However, the model's explanatory power is modest ($R^2 = 0.243$; adjusted $R^2 = 0.156$), which means that most of the variation in import volumes is explained by factors outside the model. Only the exchange rate ($\beta = -0.315$, $p = 0.003$) and population ($\beta = 49.580$, $p = 0.003$) are statistically significant at the 5% level (Table 2). The coefficients of domestic production and the international price are negative, as import demand theory predicts, but they are not statistically significant.

The insignificant effect of domestic rice production ($\beta = -11.838$, $p = 0.418$) should be interpreted carefully. It does not mean that domestic production is unimportant; rather, production alone does not determine import decisions. This result is consistent with Prinadi et al. (2016) and Anggraeni et al. (2023). As the interviews below show, the government maintains a rice stock for three to six months, so imports may continue when domestic production rises but is still insufficient to meet the reserve target.

The absence of a significant effect of international rice prices ($\beta = -1.252$, $p = 0.130$) indicates that Indonesia's rice import decisions are not driven solely by international price changes. Unlike many other traded commodities, rice is a strategic food directly linked to national food security and stability. This finding is consistent with Christianto (2013) and with the long-run results of Karuniatama and Purwiyanta (2023). The government may continue importing rice even when international prices rise if national reserves fall below target levels; conversely, lower international prices do not necessarily lead to larger imports when domestic production and reserves are sufficient.

The exchange rate has a significant negative effect on rice imports ($\beta = -0.315$, $p = 0.003$). Because international rice transactions are mainly conducted in US dollars, exchange rate fluctuations directly affect government procurement expenditure, import budgeting, and fiscal planning. A depreciation of the rupiah against the US dollar increases the domestic cost of imported rice and thereby reduces import volumes, whereas an appreciation increases purchasing power and may increase imports. This result is consistent with Putra et al. (2019) and Salsabil and Sri S. (2023). From a managerial perspective, procurement timing, budget allocation, and purchasing schedules should be aligned with macroeconomic conditions to minimize procurement costs while ensuring adequate stocks.

Population has a significant positive effect on Indonesia's rice imports ($\beta = 49.580$, $p = 0.003$): as the population grows, import procurement rises to meet growing domestic food demand. This result is consistent with Permatasari (2020) and Oktaviana et al. (2023). Population growth is a long-term structural driver of rice imports rather than a short-term economic factor, so the government should anticipate future consumption needs shaped by demographic trends, urbanization, and changing dietary patterns. Because population and the exchange rate are highly collinear, however, the separate magnitudes of these two coefficients should be interpreted with caution.

Business and Policy Strategies in Rice Import Management

Interviews with representatives of the Ministry of Trade and Perum BULOG consistently revealed that rice import management in Indonesia extends beyond economic optimization. The informants emphasized that the primary objectives of import policy are to maintain adequate public rice reserves, stabilize domestic prices, protect consumers while supporting domestic farmers, and ensure supply continuity during periods of uncertainty. Rice import management should therefore be conceptualized as a strategic governance process rather than solely as a response to import demand (Table 3).

In its facilitator role, the government facilitates rice imports by issuing permits, supporting international cooperation, and managing logistics and distribution. Permit approval follows two stages: *"We must first submit a Commodity Balance (NK) to the Ministry of Agriculture, and then process the import permit through the INSW system at the Ministry of Trade."* The NK application usually takes longer. Common challenges include choosing the receiving port, adjusting import quantities, disruptions of the Indonesia National Single Window (INSW) system, and unpredictable weather. To prevent shortages, the government maintains a three- to six-month stock: *"The stock in the warehouse is actually prepared for three to six months, so it doesn't run out immediately."* This allows imports to continue even when domestic production is sufficient or international prices are stable, because the priority is both current demand and future supply security.

The Ministry of Trade indicated that the licensing mechanism is governed by a service-level agreement, as set out in Minister of Trade Regulation No. 18 of 2025 on import policies and arrangements for agricultural and livestock goods and Minister of Trade Regulation No. 37 of 2025, which amends the general import regulation (Kementerian Perdagangan Republik Indonesia, 2025a, 2025b). Licensing functions as a regulatory instrument to prevent unauthorized rice imports. Before a permit is issued, the commodity balance must establish domestic demand and stock availability. According to an official, *"The permit issuance process includes cross-ministerial coordination because import decisions are not only determined by the Ministry of Trade but also consider verification results from technical ministries such as the Ministry of Agriculture."* The entire process, including application, verification, and permit issuance, is conducted electronically, and the commodity balance determination is automatically transmitted to the Ministry of Trade as the primary requirement for issuing an import approval. Licensing therefore serves not only an administrative function but also regulates the balance between domestic supply and import requirements.

In determining the country of origin of rice imports, BULOG identified two patterns. The first is direct appointment (government-to-government), based on a memorandum of understanding between the Indonesian government and the partner country that specifies the supplier, quantity, and contract duration. The second is an open tender (government-to-business) involving rice-producing countries such as Vietnam, Thailand, Myanmar, Cambodia, and Pakistan. According to the informants, Indonesia maintains long-standing trade relationships with Thailand and Vietnam because of their stable production capacity, established export infrastructure, and consistent product quality. Supplier selection is therefore influenced not only by price but also by institutional trust, delivery reliability, logistics performance, and responsiveness during supply uncertainty. In addition, not all countries permit exports at all times, because such policies depend on their domestic food stocks; the country of origin is therefore typically considered during commodity balance preparation, when the government evaluates the availability of supply from partner countries.

Regarding logistics, the informants stated that government support involves accelerating loading and unloading through coordination with the Ministry of Transportation, the Directorate General of Customs and Excise, the Indonesian National Armed Forces (TNI), and local governments. Common challenges include weather, port congestion, and changes in quantity. To lower logistics costs, BULOG is increasing the number of receiving ports, distributing stocks more evenly across regions, and regularly reviewing freight rates. BULOG noted that the main logistics cost is distribution from the port to the receiving region rather than the import process itself. The Ministry of Trade does not manage logistics directly; this responsibility lies with the National Food Agency (Bapanas) and the Directorate General of Domestic Trade. Logistics facilitation is therefore mainly handled by the implementing agency, while policy and

regulation remain with the relevant ministries.

Through its regulatory function, the government balances market efficiency with national food security objectives. Rice imports are managed within an institutional framework that encompasses import quotas, safety standards, and tariffs. Import quotas are used to ensure adequate national stocks when domestic production is insufficient and to stabilize domestic rice prices and supplies. As one informant noted, *"Import quotas are important when the rice commodity balance is in deficit to maintain stocks. If there is a surplus, imports are unnecessary, as in 2025 there will be no imports because domestic stocks are sufficient."* According to the Ministry of Trade, the quality and safety standards for imported rice follow the 2020 Indonesian National Standard (SNI) for rice, with specifications determined by the Ministry of Agriculture and other technical institutions. Quality inspections are conducted in the country of origin and upon arrival at Indonesian ports by technical ministries and quarantine authorities. BULOG reported that no quality violations have been identified to date, because any commodity that fails to meet the standards is rejected. For supervision, BULOG coordinates with the relevant institutions through an integrated electronic document system in which quality documents, certificates, and verification results are uploaded, which supports transparent supervision and documentation. According to BULOG, imported rice is subject to an import duty of Rp450 per kilogram (Kontan, 2023) and 2.5% income tax (PPh), while value-added tax is exempted as a form of government support. BULOG also noted that import duties have minimal effect on total procurement costs and that imported rice remains less expensive than domestic rice despite these charges.

In its catalyst role, the government provides targeted support and coordinates institutions. Both BULOG and the Ministry of Trade stated that the government does not provide financial assistance for imports or purchases; import financing is borne by the importer. Instead, government support is provided through programs such as the Food Supply and Price Stabilization (SPHP) rice program, which gives the public access to quality rice at more affordable prices. One informant explained that *"Many institutions are involved in the rice import process, such as Customs, the Ministry of Transportation, the Ministry of Agriculture, the National Food Agency (Bapanas), the Ministry of Trade, and the Indonesian National Armed Forces (TNI) and the Indonesian National Police (Polri), who assist with security during unloading at the port."* Each institution acts according to its authority, and a joint decision-making mechanism takes into account domestic production, supply availability, rice prices, and national distribution needs.

Discussion

The integration of the quantitative and qualitative analyses suggests that economic variables function as inputs to strategic decisions rather than as direct determinants of import policy. Government institutions systematically monitor macroeconomic and agricultural indicators to assess risks to national food availability. Before import decisions are implemented, these indicators are deliberated among multiple stakeholders, including the Ministry of Trade, Bapanas, and Perum BULOG. This coordinated approach allows policymakers to balance economic efficiency with broader public policy objectives, including food security, market stability, consumer protection, and farmer welfare. It also helps explain the modest explanatory power of the econometric model: a large part of the variation in import volumes reflects institutional decisions that the economic variables do not capture.

The findings further indicate that deliberate rice import management is implemented through the three complementary functions of facilitator, regulator, and catalyst. These functions act as components of an integrated governance system that transforms economic information into

Table 3. Business and Policy Strategies in Rice Import Management

Government function	Business strategy	Policy strategy	Implementation evidence
Facilitator	Facilitate efficient procurement, international sourcing, licensing, and logistics to ensure uninterrupted rice imports.	Establish import licensing procedures, promote international cooperation through government-to-government (G2G) and government-to-business (G2B) channels, and improve logistics and distribution systems.	Commodity balance and import approval through the INSW; bilateral agreements with rice-exporting countries; coordination of customs clearance, ports, transportation, and regional distribution; inter-ministerial coordination to accelerate import processes.
Regulator	Create a predictable business environment by managing import volumes and applying quality standards.	Determine import quotas, establish food safety and quality standards, regulate tariffs and customs procedures, and oversee compliance.	Annual import quotas set according to the commodity balance; quality inspections before shipment and upon arrival; import tariffs and customs regulations; monitoring by the Ministry of Agriculture, the Ministry of Trade, Customs, and BULOG.
Catalyst	Enhance price stabilization and strengthen supply chain resilience through collaboration between public institutions and market participants.	Implement targeted subsidy programs, coordinate cross-sectoral governance, clarify institutional responsibilities, and promote evidence-based policy formulation.	The SPHP rice program; coordination among BULOG, Bapanas, the Ministry of Agriculture, the Ministry of Trade, Customs, the Ministry of Transportation, and security agencies; joint decision-making based on production, stocks, prices, and distribution needs.

Source: processed interview data (2025).

strategic policy actions. Quantitative indicators provide evidence on the current and projected state of food supply and demand, while institutional capabilities shape the government's response to these conditions. Import decisions therefore reflect strategic judgment rather than automatic market reactions, which clarifies why variables such as domestic production and international prices may show limited statistical significance yet remain central to policy deliberations. In this respect, Indonesia's rice import management resembles strategic supply chain management more than conventional public procurement.

The government must manage multiple sources of uncertainty simultaneously, including production risk, exchange rate fluctuations, supplier reliability, logistics constraints, export restrictions by partner countries, and climate-related disruptions. Successful import management therefore depends not only on reducing procurement costs but also on maintaining sup-

ply continuity, coordinating institutional responses, and strengthening the durability of the system. These capabilities align with the supply chain resilience literature, which emphasizes flexibility, visibility, collaboration, and adaptive decision-making as essential capabilities under uncertainty (Christopher & Peck, 2004; Ponomarov & Holcomb, 2009).

Conclusion and Recommendation

This study demonstrates that Indonesia's rice import policy is shaped by both economic conditions and institutional decision-making. The exchange rate and population significantly influence rice import volumes from Thailand and Vietnam in 2004–2023, whereas domestic rice production and international rice prices, although they have the expected negative signs, are not individually significant. These results suggest that economic variables are important indicators for import decisions but do not, by themselves, determine government policy.

The qualitative analysis reveals that Indonesia manages rice imports through three complementary government roles. As a facilitator, the government coordinates procurement, licensing, logistics, and reserve management. As a regulator, it establishes import mechanisms, quotas, standards, and tariffs and maintains market stability. As a catalyst, it promotes long-term food security through targeted programs and cross-institutional coordination. Together, these roles position rice import management as a strategic governance mechanism rather than solely a trade policy. By integrating quantitative evidence with policymakers' perspectives, the study indicates that deliberate rice import management combines economic data with institutional capacity to ensure food availability, stabilize markets, and enhance the long-term resilience of the food system.

Policymakers are advised to strengthen integrated decision-support systems that incorporate domestic production, food reserves, exchange rates, international market conditions, and demographic trends. Strategic imports should continue to complement domestic agricultural development through sustained investment in productivity, infrastructure, technological innovation, and climate-adaptive farming.

This study has several limitations. The independent variables take the same value for both exporting countries in a given year, so the cross-sectional dimension adds information only on the dependent variable and the effective number of independent observations of the regressors is 20 rather than 40; the standard errors may therefore be understated. The exchange rate and population are highly collinear, and the model explains only a modest share of the variation in imports. The interviews covered two institutions. Future research should use estimators that address these issues, such as time-series models with lagged effects or country-specific import prices, include additional institutional and external variables such as stock levels and import quotas, involve more informants, and compare major rice-importing countries.

Authors' Declaration

Anisa Prity Mas (70%): research concept and design, data collection and assembly, data analysis and interpretation, and writing of the article. Puspi Eko Wiranthi (30%): research concept and design, critical revision of the article, and final approval of the article.

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