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Inclusive Pricing of Rice in Thailand: An Empirical Analysis

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Abstract

Rice and rice planting are very important to Thailand's social, politic and economy. Thailand is a major rice producer and exporter, thus contributed significantly to the country economy. Thailand is the second largest rice exporter in the world after India. Rice is a staple food in Thailand and majority of farmer in the country are rice planters. Therefore, the health of the rice sector directly affects Thailand's socio-political landscape. The government of Thailand constantly weighing and balancing an inclusive rice price. On one hand, a low rice price is affordable to citizens but harmful to the rice farmers' income, which in turn puts the sustainability of rice farming at risk. On the other hand, high rice price enhanced the farmers' income and acts as incentive to boost rice planting to ensure food security but may be burdensome to the lower income group of citizens. Hence, insights into the major factors that can affect rice price are great

help to policymakers in balancing an inclusive pricing for rice that is sustainable and fair for everyone.

The inclusivity of rice prices in Thailand has come under growing study due to host of factors that have increase rice price volatility that threatened the stability of both domestic and international rice markets. These volatility in rice prices will cause inclusive bias on either one side between the producers (farmers) and the consumers, between the wealthy and poor citizens, threaten the Thailand's rice industry sustainability as well as impacted global staple food sufficiency. A robust rice industry enhances food security and thus serves SDG2 (Zero Hunger). In addition, a stable and inclusive rice pricing helps to achieve SDG1 (No Poverty), SDG9 (Decent Work and Economic Growth) and SDG10 (Reduce Inequality). It also motivated this research to analyzing three major hidden factors that have driven rice prices volatility in Thailand and thus, threaten rice price inclusiveness. This is crucial to bring stability and sustainability to the rice industry in both short-term and long-term. Three of those factors that have evaded the attention of past research but pose a volatility issue to rice market in Thailand and inclusivity policy dilemma to policymakers are exchange rate, domestic income levels, and inflation. The scope of this paper consists of 36 years of annual time series data from 1990 to 2023. Vector error correction model (VECM) is applied to analyze the short-run and long-term dynamics of rice price volatility that affects the sustainability of the whole rice industry.

Past literature showed that volatile rice price can pose a significant risk to different stakeholders and disturb the stable inclusive pricing. For instance, Adeniyi et al. (2019) study the impact of price volatility on rice farming in Nigeria, while Putra et al. (2021) explored similar issues in Indonesia. Additionally, Ahmed et al. (2025) investigated the consequences of unstable rice prices on production in Bangladesh. Thailand, as a major rice exporter, faces constant fluctuations in its currency, the Thai baht, which impacts the actual price Thai rice can fetch in global markets. If Marshall-Learner condition applied, economic theory on exchange rate will tell that when the baht appreciates relative to other currencies, Thai rice becomes more expensive for foreign buyers and thus its export become less competitive (Sek & Har, 2014). This reduces the demand for Thai rice in international markets, leading to potential surpluses in domestic supply and downward pressure on domestic prices. Lower than the fair inclusive price will benefit the consumers to the expense of the rice farmers. Putra et al. (2021) make a similar study on Indonesia.

Inflation is another macroeconomic policy concern that has an ambiguous effect on rice prices. Do rice prices rise and fall in tandem with inflation? Rising inflation can lead to higher production costs, including the cost of seeds, fertilizers, pesticides, laborers, fuel and utilities expenses. These increased costs can erode their profit margins, potentially forcing them to raise prices to cover the additional expenses and thus, bring in concern to the Thai government to maintain an inclusive price that is fair

to every stakeholder (Farooqi, 2023; Thaichareon and Stapporncharnchai, 2025). The level of domestic income in Thailand plays a major role in shaping domestic consumer demand and hence, the price for rice. While rice is a staple food in Thai households, its demand may be inelastic. Yet lower household income reduces consumer purchasing power, making it difficult for farmers to sell their rice at fair prices, thus exacerbating the impact on rice farmers relative to other stakeholders. Moreover, any increase in the cost of rice cannot be passed through to increase price, thus disproportionately affects poorer households, including the rural farmers (Putra et al., 2021). While decreasing income level or economic recession poses concern to rice farmers in Thailand, an increasing aggregate income may pose different challenges to rice farmers. As aggregate income level increases, can rice prices and the income of rice farmers rise proportionately? Yanti et al. (2021) reported a positive impact of income increase on rice prices in North Sumatra due to demand-driven cost-push inflation but Wulandari, et al. (2020) has an opposite finding on East Java, Indonesia.

This paper analyzes the impact of inflation, aggregate income, and exchange rate on the volatility of Thailand's rice price, using 36 years of annual time series data from 1990 to 2023. Data for rice price, exchange rate, inflation, and aggregate income were sourced from the International Monetary Fund (IMF), the Board of Governors of the United States Federal Reserve System, the World Bank and the National Statistical Office (NSO) of Thailand, respectively. The Vector Error Correction Model (VECM) is used for regression analysis due to its suitability and ability to analyze both long run cointegration relationships and short run dynamics (Khin et at., 2025 and Wulandari et al., 2020). This paper used the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test to check for unit root and the Johansen Cointegration Rank Tests to unveil existing of cointegrating vectors. The Granger Causality test is also employed specifically to find any causal links between the variables, which is helpful to policymakers to moderate inclusive pricing. Common diagnostic tests are applied, namely test for normality, heteroskedasticity, autocorrelation and multicollinearity.

Both ADF and PP test for unit root indicate all variable significant at first difference. Johansen Cointegration Rank Tests found at least two cointegrating vectors, thus pathing way for Vector Error Correction Model (VECM) regression. Finding from VECM regression reveal that rice prices in Thailand are positively affected by aggregate income changes. The finding is good news for policymakers because a positive income effect is less harmful to inclusive policy regarding rice pricing. However, results reveal that rice prices are insignificant to the changes of inflation and exchange rate. These two findings pose concerns about rice farmers' welfare and production sustainability in the event of any adverse inflation or exchange rate change. From the perspective of inclusive growth, these findings justify the government's establishment of an income safety net policy to ensure the sustainability of rice prices and, therefore, rice production in Thailand. In addition, findings reveal that both exchange rate and inflation are affected by their respective past changes. For example, higher inflation in current period

significantly causes higher inflation in the next period. Thus, any adverse movement of inflation and exchange rate will be persistent in the future and thus putting welfare of either group(s) of stakeholders at risk while benefiting the other group. If such events happen, government's aim for welfare inclusiveness will be at risk too.

The long run Granger causality findings are similar and thus support the short run results. Granger causality findings further emphasize the reciprocal long-term relationship between rice price and aggregate income level, implying that higher income level can support rice price while higher rice price can generate high income, especially to rice farmers. Thus, it is important that rice prices can be sustained at high level to avoid a negative spiral impact of lower rice prices and lower income. However, in long run, results found that inflation Granger causes rice prices. This reduces pressure of inflation eroding the purchasing power of rice farmers and hence, lessens the pressure on government in defending an inclusive rice price for the benefit of all stakeholders. Regression results are valid and pass all diagnostic checks. Breusch–Pagan test found not significant existence of heteroskedasticity problem, LM test found no autocorrelation, Jarque–Bera test indicates normality is observed and VIF test show no serious multicollinearity.

In conclusion, rice is an important source of food, income, and cultural identity, and it directly or indirectly affects the country's aim to promote inclusive growth as per the sustainable development goals. Therefore, sustaining an inclusive rice price can promote a healthy rice industry and ensure the welfare of all stakeholders.

Keywords:
Inclusiveness; Rice prices; Exchange rate; Inflation; Income; Thailand

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