Agris on-line Papers in Economics and Informatics

Volume XVIII Number 3, 2026

Food Inflation and Poverty in Indonesia: How Regional Disparities Shape Economic Hardship

Misbahol Yaqin [1], Naufal Alfaraby Winandita[2]

[1] Department of Economics, Faculty of Economics and Business, University of Jember, Indonesia

[2] Department of Economics, Faculty of Economics and Business, Diponegoro University, Semarang, Indonesia

Abstract

We examine the impact of rising food prices on poverty in Indonesia by considering regional characteristics. Using panel data from 34 provinces in Indonesia from 2013 to 2024, we apply the Generalized Method of Moments (GMM) to estimate the relationship between food price inflation and poverty rates. We find that rising food prices significantly increase poverty levels. The results are consistent across models. The impact is more severe in rural areas compared to urban areas, indicating greater vulnerability of rural households to food price fluctuations. Moreover, we find that in Western Indonesia which are a more developed regions experiences a lower poverty impact from rising food prices compared to Eastern Indonesia. These findings highlight the need to stabilize food prices to support inclusive development. Strengthening regional food security, ensuring targeted funding, and implementing effective food subsidies are essential to mitigate the impact of food price inflation on low-income populations.

Keywords

Food price inflation, poverty, rural poverty, food security.

Yaqin, M. and Winandita, N. A. (2026) "Food Inflation and Poverty in Indonesia: How Regional Disparities Shape Economic Hardship", *AGRIS on-line Papers in Economics and Informatics*, Vol. 18, No. 3, pp. 123-135. ISSN 1804-1930. DOI 10.7160/aol.2026.180309.

Introduction

Food prices on the global market have experienced significant fluctuations over the last decade. A sharp rise in food prices occurred in 2007, followed by a drastic decline in 2008 following the Global Financial Crisis (GFC). In 2010, food prices increased again and reached their highest peak in 2011 (Rivai, 2022). Most recently, the increase in food prices occurred in 2021 due to geopolitical clash in Russia and Ukraine compounded by prolonged Covid-19 pandemic (Adjemian et al., 2023; Monge and Lazcano, 2022; Suryahadi et al., 2020). According to FAO data, the mean for food price index is projected to reach 143.7 points in 2022, marking a 14.3% rise from 2021 and recording the highest level since commenced in 1990. This notable surge in food prices exacerbates the enduring repercussions of the Covid-19 pandemic crisis which leads to constraining the growth of developing nations.

In the same period, the inflation rate in Southeast Asia Countries including Indonesia was relatively high triggered by rising food prices. In 2022, food inflation reached 5.61% (yoy), above headline inflation of 5.51% (yoy). In the last ten years, the average food inflation in Indonesia has also reached 5.80%. The predominant cause of the elevated inflation rate in recent years has been the escalation in food prices. This surge can be attributed primarily to a decrease in agricultural production resulting from adverse weather conditions and a range of supply constraints (Affandi, 2015; Anugrah and Pratama, 2018; Pratikto and Ikhsan, 2016). Regarding demand dynamics, population growth and heightened remittance flows are driving an uptick in the demand for cereal grains. Consequently, this heightened demand is exerting pressure on prices within the market.

Increasing food prices have a real impact on social economics, including poverty. Increasing food prices can cause community vulnerability especially in poor households because it can reduce income and disrupt consumption patterns (Bhattacharya, 2017; Fujii, 2013; Wu and Xu, 2021). The proportion of food consumption in Indonesia's households also has the largest portion, reaching

around 50.41% in 2022. An increase in food prices has the potential for welfare in society. Increased spending on food due to price increases can also result in reduced funding allocations for the health and education sectors. Moreover, this could hinder investment in crucial elements of agriculture, such as fertilizer, fuel, and electricity, which are essential factors in increasing food production (Fujii, 2013; Hammoudeh et al., 2015; Samal et al., 2022).

The impact of rising food prices on social economics such as poverty is still a matter of debate in empirical level. Studies conducted by Ivanic et al. (2012); Shrestha and Chaudhary (2012); Fujii (2013); Warr and Yusuf (2014); Misdawita et al. (2019) find the influence of food prices on poverty dynamics in several countries and mostly found a negative impact between the two. This means that rising food prices drive up poverty levels. Food inflation has a greater impact on poverty when the population spends more on food than any other bundles (Shrestha and Chaudhary, 2012). However, the impact is smaller when the share of expenditure on food consumption is relatively low. In contrast, Headey and Hirvonen (2023) show that increasing food prices has a positive impact on reducing poverty levels in 33 middle-income countries. The escalation in food prices implies that numerous individuals from low-income backgrounds are involved in either producing or marketing food. The higher prices act as incentives for augmenting food production, thereby potentially increasing overall food supply.

In Indonesia, studies examining the impact of rising food prices on poverty and unemployment are still relatively limited. Faharuddin et al. (2023) dan Ivanic et al. (2012) investigated the effects of rice price increases on poverty in Indonesia, while (Warr and Yusuf, 2014) focused on the poverty impact using international prices for six food commodities. In more recent study, Misdawita et al. (2019) employed a social accounting matrix to analyze the poverty implications of four food commodity prices (rice, corn, soybeans, and sugar). Their collective findings suggest that most households in Indonesia including those residing in rural areas suffer from a declining household welfare and increasing poverty due to rising rice prices.

Although several previous studies have studied the impact of food prices on poverty, no study has studied its impact on a regional scale. Differences in regional characteristics such as urban and rural as well as eastern and western Indonesia have the potential to have different implications. Therefore, our study aims to review the impact of food inflation on poverty in Indonesia by reviewing regional aspects. This will contribute to literature in three ways. First, we explore a potential impact of food inflation on poverty in Indonesia. We also try to explore further and seek the effect of food inflation on poverty based on regional development aspect. This allowed us to see the magnitude of the impact in more developed and less developed regions. Second, we continue the exploration into non-linear effect of food inflation on poverty. Third, this research will study the impact on poverty by considering richer provincial-level data, which is available for 34 provinces in Indonesia.

Literature review and hypotheses construction

The correlation between food inflation and poverty has been extensively explored across a diverse range of literature. Most of the literature explains that rising inflation has a negative impact on society, especially worsening development problems such as poverty. Elevated food prices naturally reduce the disposable income of the poor, given their substantial allocation of earnings towards food expenses (e.g., 50% or more for the most financially vulnerable). Additionally, even short-run income disturbances can have lasting negative repercussions, particularly affecting long-term nutritional and health outcomes.

Several previous studies, including the investigation conducted by Shrestha and Chaudhary (2012) on the relationship between food inflation and poverty in Nepal, consistently affirm the detrimental impact of escalating food prices on poverty levels. Their findings indicate that a 10 percent increase in food prices could lead to a 4% rise in overall poverty in Nepal. Moreover, their research suggests that such a price surge could result in 1 million more individuals falling into poverty, with 6.7 million poor people already facing economic challenges. Hence, policymakers must prioritize efforts to mitigate food price inflation and ensure the availability of an ample food supply.

Kıroğlu and Sezgin (2021) examined the association between food inflation and poverty in Turkey from 2016 to 2019, utilizing data from the Household Budget Survey. They found that rising food prices appear to increase poverty in regional Turkey. People's behaviour that tends to be consumerist, encourages quite large changes in their welfare when food inflation increases. In the same direction, Ivanic et al. (2012) analysed how price changes for 38 agricultural commodities affected poverty across 28 countries.

They found that a 1% increase in food prices led to a 1.1 percentage rise in poverty in low-income countries and a 0.7 percentage point rise in middle-income countries.

Valero-Gil and Valero (2008) evaluated the effects of rising food prices from 2006 to 2008 on poverty and extreme poverty rates in Mexico. Their study revealed a slight increase in poverty when comparing 2006-2007 prices, but a significantly larger impact on the poor when considering 2008 prices. After incorporating the positive impacts of public policies implemented in 2008, such as reduced taxes and tariffs on food items and increased subsidies for the most vulnerable, the poverty rate measured by consumption rose from 25% to 33.5%. Moreover, extreme poverty increased from 10.58% to 16%, accounting for the rise in food prices.

Although most researchers found a negative impact of rising food prices on poverty, Headey and Hirvonen (2023) study found something different. They found that increasing food prices had a positive impact on reducing poverty levels in 33 Middle-Income Countries. Panel regression analysis shows that yearly rises in real food prices correlate with a decreasing in poverty rate at US$ 3.20 per-day poverty line, except in more urban or non-agrarian countries. This is likely due to increased agricultural activity in response to higher prices, leading to greater demand for unskilled labor and higher wages. In addition, higher food prices incentivize poor people that has connection in food production or marketing to expand their efforts, thereby increasing food production.

Headey and Hirvonen (2023) findings are in line with studies from Headey (2018). Headey (2018) investigated revealing a reduction in poverty levels concurrent with food price inflation. This phenomenon can be elucidated empirically by the pronounced responsiveness of agricultural supply and wages to escalating food prices, compounded by the predominant reliance of the global impoverished population on agriculture or other related efforts for sustenance. The escalation in food prices caused a surge in income, notably among individuals entrenched in the agricultural sector.

The impact of food inflation on poverty varies between rural and urban regions, with distinct consequences for rural households. In rural areas, rising food prices may lead to increased income for food-producing households; however, this benefit is relatively small compared to the overall challenges posed by inflation (Faharuddin et al., 2023; Prayoga et al., 2025). For instance, in Indonesia, the income rise for these households is not sufficient to offset the general poverty increase observed during food price crises, as overall poverty in rural areas rose significantly, although less dramatically than in urban contexts (Faharuddin et al., 2023; Shahbaz et al., 2022). Moreover, food inflation exacerbates food insecurity, limiting access to nutritious food and heightening malnutrition rates, particularly among vulnerable populations in rural settings. The increased cost of food can diminish purchasing power, especially among net food consumers who lack sufficient income or resources, further entrenching poverty (Prayoga et al., 2025). Consequently, addressing food price inflation through supportive policies is critical to enhancing food security and alleviating poverty in these regions (Luster et al., 2023; Xi et al., 2025)

Nevertheless, we decided to develop hypotheses based on the first side of the previous literature. We thought that Indonesia has still faces several economic challenges. Such escaping the middle-income trap and the vulnerable people hanging around poverty line would be sufficient to think that any form of increase in food commodities price will lead to an elastic change in demand for those commodities[1]. Therefore, we expect that increasing food inflation in Indonesia will decrease the purchasing power of vulnerable people and consequently stumbled them into poverty. In addition to that, we also explore a possible non-linear effect of food inflation on poverty in Indonesia. We believe that there is an optimal range of food inflation for achieving a very low increasing response of the poverty rate in Indonesia.

The second thought is we also expect that the rising of food inflation in Indonesia would affect the urban and rural poverty in a different degree of effect. In Indonesia, we assume that rural people are more vulnerable than urbans because the poverty rate in rural is higher than in urban[2]. Thus, we expect that food inflation will affect more to rural poverty than urban poverty. Another point of view is we try to seek the effect on food inflation to poverty in Indonesia with respect to regional development aspect. We believe that Indonesia still faces struggles in achieving equal growth

[1] Recent report by LPEM FEB UI, 2025 in *Indonesia Economic Outlook Q3-2025* says that until 2024, around 9% of Indonesian categorized as "Poor", 24% of Indonesian categorized as "vulnerable", and 49% categorized as "aspiring middle-class". Leaving only one-fifth of Indonesian that categorized as middle-class and upper-class.

[2] As of 2024, Central Bureau of Statistics Indonesia reported that 6.66% people lived in poverty in urban areas, while 11.34% people lived in poverty in rural areas.

and development across all regions. In Indonesia, it is obvious to see the unequal development between Western and Eastern Indonesia[3]. Hence, because of the unequal development across regions, we expect that food inflation will harm more in Eastern Indonesia rather than in Western Indonesia.

Materials and methods

Data

We examine the impact of food price inflation on poverty Indonesia. The volatility of inflation has significant implications for Indonesia's development, particularly in relation to poverty. These two indicators are critical targets outlined in the National Medium-Term Development Plan (RPJMN) 2020-2024[4]. To achieve the research objectives, we utilized panel data from 34 provinces in the range of 2013 to 2024. During this period, Indonesia faced notable instances of food inflation, such as the 2013 spike following fuel price increases, and the 2022 inflation surge driven by global geopolitical conditions (Aji, 2015; Purwono et al., 2020).

We use several macroeconomic indicators such as poverty and food price inflation as the primary variable of interest. The poverty data is obtained from the Central Bureau of Statistics, specifically percentage of poor population (P0) by province. Poverty is measured as the percentage of individuals living below the poverty line[5]. In Indonesia, they measure the poverty line using the Cost of Basic Needs (CBN) method, which estimates the minimum monthly expenditure required to meet essential food and non-food needs. As of 2024, the national per capita poverty line was set at IDR 595,242 per month, based on a minimum daily consumption standard of 2,100 kilocalories per person. Food inflation is the main explanatory variable and is proxied by the provincial Consumer Price Index for the Food, Beverage, and Tobacco group. We decide to use this measure because it directly captures price movements in the food-related consumption basket most relevant to household welfare and poverty dynamics at the provincial level. In the empirical model, this CPI-based indicator is used to represent provincial food price inflation.

The control variables include regional economic output, human development, wages, and the exchange rate. Regional economic output is measured using Gross Regional Domestic Product at 2010 constant prices and is sourced from Central Bureau of Statistics. Human development is measured by capturing the quality of human development across provinces using human development index (HDI). Meanwhile, wages are proxied by the provincial minimum wage series published also by Central Bureau of Statistics. The exchange rate denotes the value of the Rupiah against the US Dollar obtained from Jakarta Interbank Spot Dollar Rate (JISDOR) data.

For good estimation results, some selected variables are transformed into their natural logarithms to improve the suitability for linear regression models and enhance inferential accuracy (Bland and Altman, 1996; Feng et al., 2014). The data are collected from the Central Bureau of Statistics (BPS) and Bank Indonesia. A comprehensive summary of the variables is presented in Table 1.

[3] Based on our data we used, we decompose the share of GDP across regions into two categories which are Western and Eastern Indonesia. The former shares ≈ 80% of Indonesia's total GDP, while the latter shares only ≈ 20% of Indonesia's total GDP..

[4] Susenas data for March 2023 shows that the national poverty rate has only reached 9.36% or is still below the 2020-2024 RPJMN target, that is in the range of 6.5-7.5%..

5 Poverty is calculated using data sourced from the results of the National Socio-Economic Survey (Susenas) Consumption and Expenditure Module (KP Module) for the period March and September each year.

Group	Variables	Description	Source
Dependent variable	Poverty (*pov*)	Percentage of Poor Population (P0) by Province	Central Bureau of Statistics
Independent variable	Food Inflation (*food_inf*)	Food inflation proxied by CPI of the Food, Beverage and Tobacco group (%)	Central Bureau of Statistics
Control Variables	GRDP (*lngdp*)	Natural logarithm Gross Regional Domestic Product at Constant Market Prices (2010=100)	Central Bureau of Statistics
	Human Development (*hdi*)	Human Development Index	Central Bureau of Statistics
	Wage (*wage*)	Natural logarithm of Provincial Minimum Wage (IDR)	Central Bureau of Statistics
	Exchange Rate (*lner*)	Natural logarithm of Rupiah exchange rate against the US dollar obtained from Jakarta Interbank Spot Dollar Rate (JISDOR) dat	Central Bureau of Statistics and Bank Indonesia

Source: Authors

Table 1: Data and data sources.

Method

We aim to understand the impact of food price inflation on poverty rate in Indonesia. Our analysis extends beyond the national level by exploring regional variations, specifically examining the effects of rising food prices on poverty in both rural and urban areas. We will also analyze the impact of food inflation in Indonesia by dividing it into two regions, which are Western Indonesia and Eastern Indonesia. This is intended to find out the differences in aspects where Western Indonesia has more advanced development. Moreover, these geographical distinctions allow for the possibility of difference in magnitudes in the impact of food inflation on poverty across regions (Gujarati and Porter, 2009; Mustika and Nurjanah, 2021).

To assess the impact of rising food price inflation, we employ a multivariate framework. The research model is adapted from the studies of Fujii (2013) and Shrestha and Chaudhary (2012) who similarly examined the effects of food inflation on poverty. The model is formulated as follow equation 1.

$$pov_{it} = \varphi_1 + \gamma_1 pov_{it-1} + \gamma_2 foodinf_{it} + \gamma 3 lngdp_{it} + \\ + \gamma_4 hdi_{it} + \gamma_5 lnwage_{it} + \gamma_6 lner_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

Where pov_{it} is poverty rate in province i at time t. pov_{it-1} lagged poverty rate to account for persistence in poverty levels. The variable *foodinf* refers to food inflation, which is our primary variable of interest. $lngdp_{it}$, hdi_{it}, $lnwage_{it}$, and $lner_{it}$ are control variables representing regional Gross Domestic Product (province level), Human Development Index (HDI), minimum wages by province, and exchange rate. μ_i unobserved province-specific effects and ε_{it} idiosyncratic error term.

We detailed the model for exploring regional characteristic variations:

$$pov_{it}^{urban} = \varphi_1 + \gamma 1 pov_{it-1}^{urban} + \gamma_2 foodinf_{it} + \\ + \gamma_3 lngdp_{it} + \gamma_4 hdi_{it} + \gamma_5 lnwage_{it} + \gamma_6 lner_{it} + \\ + \mu_i + \varepsilon_{it} \quad (2)$$

$$pov_{it}^{rural} = \varphi_1 + \gamma 1 pov_{it-1}^{rural} + \gamma_2 foodinf_{it} + \\ + \gamma_3 lngdp_{it} + \gamma_4 hdi_{it} + \gamma_5 lnwage_{it} + \gamma_6 lner_{it} + \\ + \mu_i + \varepsilon_{it} \quad (3)$$

$$pov_{it}^{eastern} = \varphi_1 + \gamma 1 pov_{it-1}^{eastern} + \gamma_2 foodinf_{it} + \\ + \gamma_3 lngdp_{it} + \gamma_4 hdi_{it} + \gamma_5 lnwage_{it} + \gamma_6 lner_{it} + \\ + \mu_i + \varepsilon_{it} \quad (4)$$

$$pov_{it}^{uwestern} = \varphi_1 + \gamma 1 pov_{it-1}^{western} + \gamma_2 foodinf_{it} + \\ + \gamma_3 lngdp_{it} + + \gamma_4 hdi_{it} + \gamma_5 lnwage_{it} + \gamma_6 lner_{it} \\ + \mu_i + \varepsilon_{it} \quad (5)$$

We hypothesize that γ_2 in equations (1 - 5) will be positive, indicating that an increase in food inflation is expected to raise poverty levels due to its detrimental effect on purchasing power and production costs. In contrast, we anticipate that γ_3, γ_4, γ_5 will have negative signs, as improvements in macroeconomic factors are expected to reduce poverty. However, γ_6 are hypothesized to be positive, as currency depreciation may adversely affect the economy, leading to higher poverty levels in Indonesia.

Endogeneity poses a potential challenge in equations (1 - 5) as correlation between the error terms ε_{it} and the regressors could result in biased estimates of the coefficients $\gamma_{1\text{-}6}$. To address this issue, we employ the system Generalized Method of Moments (GMM) introduced by Arellano and Bover (1995) and Blundell and Bond (1998) to obtain consistent and reliable estimates. Furthermore, system GMM works better in a small sample size than difference GMM. This approach is used to address several key econometric issues. First, endogeneity concerns arise as food price inflation and poverty may have a bidirectional relationship, making OLS estimates biased. Second, the dynamic panel setting includes a lagged dependent variable pov_{it-1} which can cause autocorrelation and inconsistency in fixed effects estimation. Lastly, instrumental variables in GMM help mitigate endogeneity by using lagged levels or differences, ensuring more reliable estimates for dynamic panel data analysis.

Result and discussion

Pre-estimation results

In the range of research period, the average poverty rate in Indonesia was 11.02 percent. The lowest poverty was 3.47 percent which occurred in Jakarta province in 2019. The highest poverty was in Papua province in 2013 with 31.53 percent. In contrast to aggregate poverty, rural poverty is on average higher, reaching 13.60 percent. Meanwhile, urban poverty recorded an average poverty rate of 7.36 percent in the 2013-2024 period. This shows that rural poverty is greater than urban poverty. Regarding socio-economic indicators for control variable, the average Human Development Index (HDI) across provinces was 70.40. The highest HDI was recorded in DKI Jakarta Province at 83.03, while the lowest was in Papua Province, with an HDI value of 56.25 in 2013. These disparities underscore the regional differences in development levels and the varying impacts

of economic shocks, such as food price inflation, across different provinces (Table 2).

In terms of food inflation, the average during the research period was 4.86 percent with the lowest level being -0.40 percent and the highest inflation reaching 15.40 percent. The highest inflation occurred in 2015 in the province of DKI Jakarta. High food inflation was the impact of the policy of increasing fuel prices that year (Akhmad, 2014). This policy also has implications for increasing poverty because it disrupts people's consumption patterns through increasing transportation costs and several other goods (Izzati et al., 2023). We also performed correlation tests to identify potential multicollinearity. The results of the correlation test in this study are shown in Table 3.

As seen in the correlation matrix Table 3, some variables, particularly poverty (*pov*) and rural poverty (pov^{rural}), show a strong correlation of 0.958. This high correlation is expected, as rural poverty is essentially a subset of the overall poverty measure. However, since these two variables are included in separate models for analysis, this strong correlation does not pose a problem for multicollinearity within the model. According to Gujarati and Porter (2009), multicollinearity is generally considered a concern when two variables have a correlation coefficient greater than 0.8 within the same model. In our analysis, the correlation values between other variables are below this threshold, indicating no significant multicollinearity issues. Therefore, while there is a high correlation between poverty and rural poverty, it is not a concern in this study since these variables are modelled separately. The overall correlation analysis supports the conclusion that multicollinearity is not a significant issue in our model.

We also look at the stationarity of the data. Data that is not stationary can cause spurious regression so that the results become biased. The stationarity of the data used in this research is the unit root test using the Levin, Lin, and Chu test. Stationary data tends to approach the average value.

The stationarity tests conducted on the data, as shown in Table 4, indicate that all variables are stationary at both the 5% and 10% significance first differenced, according to the Fisher-type ADF tests, although some variable stationers in level like poverty, urban poverty, food inflation and human development index.

Variables	Obs	Mean	Median	Maximum	Minimum	Std. Dev.
pov	408	10.92	9.38	31.53	3.47	5.74
pov^{rural}	396	13.60	11.75	39.92	4.04	7.64
pov^{urban}	408	7.36	6.22	20.28	2.78	3.43
food inf	408	4.91	4.23	15.40	-3.43	3.07
lngrdp	408	11.93	11.78	14.58	9.81	1.15
lnwage	408	14.58	14.61	15.44	13.63	0.33
hdi	408	70.40	70.43	83.08	56.25	4.32
lner	408	9.55	9.54	9.69	9.41	0.08

Source: Author's estimated results

Table 2: Descriptive statistics.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) *pov*	1.000							
(2) pov^{rural}	0.958	1.000						
(3) pov^{urban}	0.429	0.181	1.000					
(4) *food inf*	-0.008	0.003	-0.039	1.000				
(5) *lngrdp*	-0.311	-0.265	-0.040	0.037	1.000			
(6) *lnwage*	-0.164	-0.041	-0.348	-0.218	0.043	1.000		
(7) *hdi*	-0.648	-0.582	-0.138	-0.107	0.455	0.325	1.000	
(8) *lner*	-0.112	-0.090	-0.072	-0.209	0.122	0.699	0.383	1.000

Source: Author's estimated results

Table 3: Correlation Matrix.

Variables	*Fisher-Type ADF (Level)*	*Fisher-type ADF (First-differenced)*
pov	0.846	0.000***
pov^{rural}	0.780	0.000***
pov^{urban}	0.293	0.000***
food inf	0.000***	0.000***
lngrdp	1.000	0.000***
lnwage	0.008***	0.005***
hdi	1.000	0.000***
lner	1.000	0.000***

Note: ***), **), and *) Stationarity at the 1%, 5%, and 10% levels.
Source: Author's estimated results

Table 4: Results of data stationarity test.

Impact of food inflation on poverty

The relationship between food price inflation and poverty in Indonesia is examined through three distinct models, as shown in Table 5. Model 1 estimates the impact of food inflation on poverty without controlling for any other variables, providing a baseline understanding of the relationship between these two factors. Model 2, in contrast, includes a full set of control variables, such as regional GDP, wages, human development index (HDI), and the natural exchange rate (lner), thereby accounting for other socio-economic factors that may influence poverty. Model 3 explores the potential non-linear effects of food inflation on poverty by adding a squared term of food inflation, allowing for the possibility that the impact of food inflation on poverty may change as food inflation rises.

Variables	Model 1 Poverty	Model 2 Poverty	Model 3 Poverty
Poverty (-1)	-0.104*** (0.027)	-0.309*** (0.093)	-0.019 (0.029)
lner		-1.477** (0. 651)	-0.749*** (0.222)
lngdp		10.854*** (2.489)	0.568 (0.411)
lnwage		-0.200 (0.202)	-1.610*** (0.172)
hdi		-1.636*** (0.249)	-0.848*** (0.039)
Food Inflation	**0.009***** (0.002)	**0. 026***** (0.009)	**-0.058***** (0.008)
Squared Food Inflation			**0.008***** (0.001)
Constant	-0.271*** (0.012)	-0.102 (0.075)	0.360*** (0.050)
Obs	340	340	340
Overidentification test (Hansen Test)	0.99	0.173	0.960

Note: (1) Estimation was conducted using the Two-step System GMM method; (2) Standard errors are in parentheses; (3) ***), **), and *) indicate statistical significance at the 1%, 5%, and 10% levels, respectively.
Source: Author's data processing results

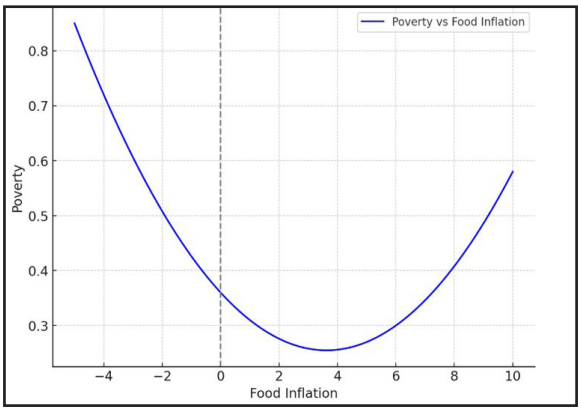
Table 5: Impact of inflation on poverty in Indonesia.

Results from the estimation reveal that food inflation has a significant positive impact on poverty in three models that show Table 5. In Model 1, the estimation shows a positive and statistically significant relationship between food inflation and poverty, with a coefficient of 0.009, indicating that a 1 percent increase in food inflation results in a 0.009 percent increase in the poverty rate, providing a baseline understanding of the direct impact of food price inflation on poverty. Model 2, which incorporates a full set of control variables, reveals a stronger impact, with the coefficient for food inflation rising to 0.026. This suggests that when accounting for other socio-economic factors, a 1 percent increase in food inflation leads to a 0.026 percent increase in poverty, highlighting that food inflation exacerbates poverty more significantly when broader economic conditions are considered. These results emphasize the need to account for various socio-economic factors when analyzing the impact of food inflation on poverty. This result is in line with several previous studies where Increasing food prices causes community vulnerability, especially in poor households, because it can reduce income and disrupt consumption patterns (Bhattacharya, 2017; Fujii, 2013; Wu and Xu, 2021).

Food price inflation drives poverty by disrupting consumption patterns and income for the Indonesian population. The relatively high poverty rate and the fact that over 50 percent of Indonesian household expenditures are allocated to food make price increases have a more significant impact on the well-being of the population in Indonesia (Hill, 2021). Rising food prices burden expenditures on food and can lead to further consequences such as malnutrition and hunger. These conditions subsequently have more serious implications for future economic development. The impact can also cascade into related sectors, reducing consumer spending on non-essential goods and services and potentially disrupting business sustainability across various sectors

(Aji, 2015; Rammohan and Tohari, 2023).

We also exploring the possibility non-linear effect of food inflation on poverty in Indonesia as we can see above in Table 5 (Model 3). We can confirm that there is a non-linear effect of food inflation in Indonesia. This allows us to explore the optimal level of food inflation in Indonesia to minimize the increasing response on poverty rate. As we can see, the optimal level for food inflation is based on the slope of the non-linear function that is equal to zero (see Figure 1 below). It is possible to state that optimal level of inflation can represent as an indicator of economic activity through productivity channel. Thus, targeting food inflation in the range of 3% is somehow optimal.



Source: Author's data processing results

Figure 1: The non-linear effect of food inflation on poverty rate.

Impact of food inflation on poverty: regional perspectives

From a regional perspective (Table 6), we found that food inflation also affects poverty in both urban and rural areas. However, there is a difference in the degree of influence, which is greater in rural areas compared to urban areas. 1 percent increase in food prices affects poverty by 0.024 percent in rural areas and 0.023 percent in urban areas. Rural communities are more vulnerable to food price increases due to lower income buffers and purchasing power. In contrast, in urban areas, higher incomes mitigate the impact of rising food prices. Examining the poverty conditions in both regions reveals that the rural poverty rate is much higher than that in urban areas. In 2023, rural poverty in Indonesia reached 12.22 percents, significantly higher than urban poverty, which stood at 7.29 percent.

Variables	Model 1 Urban Poverty	Model 2 Rural Poverty
Urban/Rural Poverty (-1)	-0.321*** (0.045)	-0.301*** (0.042)
Food Inflation	0.023*** (0.005)	0.024*** (0.005)
lner	1.362*** (0.349)	-0.658* (0.367)
lngdp	7.999*** (1.176)	7.716*** (1.039)
lnwage	-0.693*** (0.113)	0.590** (0.285)
ipmhdi	-1.589*** (0.139)	-1.128*** (0.092)
Constant	0.269*** (0.042)	-0.134** (0.056)
Obs	340	330
Overidentification test (Hansen Test)	0.235	0.370

Note: (1) Estimation was conducted using the Two-step System GMM method; (2) Standard errors are in parentheses; (3) ***), **), and *) indicate statistical significance at the 1%, 5%, and 10% levels, respectively.
Source: Author's data processing results

Table 6. Impact of inflation on regional poverty.

The disparity in the impact of poverty in rural and urban areas is also influenced by increasing inequality in Indonesia. Data from the Central Bureau of Statistics (BPS) indicates that inequality in Indonesia in 2023 reached 0.388, an increase from the previous year's 0.381. This increase in inequality suggests a rise in poverty in Indonesia. Moreover, the role of poverty in Indonesia is more food oriented. The contribution of food commodities to the Poverty Line is much greater than that of non-food commodities. The distribution of the poverty line in Indonesia in 2023 shows that 74.21 percent is attributed to food commodities and 25.79 percent to non-food items.

To enrich the analysis, we also present the estimation results by dividing two different regions, namely western Indonesia and eastern Indonesia. These two regions have different characteristics where western Indonesia has a more advanced economic development condition while eastern Indonesia is the opposite. The estimation results are shown in Table 7.

The estimation results show that the increase in food prices is also statistically significant in increasing poverty in both western and eastern Indonesia. 1 percent increase in food prices increases the poverty rate by 0.017 percent in western Indonesia and 0.055 percent in eastern Indonesia. These results indicate that the impact of rising food prices on poverty levels is greater in less developed areas (Eastern Indonesia) compared to more

developed areas (Western Indonesia). Rising food prices worsen poverty and food insecurity more in less developed regions due to high income allocation to food, weak safety nets, economic vulnerability, and widespread informal employment. Without effective policies and international aid, such price surges can lead to severe humanitarian crises.

Variables	Model 1 Western Indonesia Poverty	Model 2 Eastern Indonesia Poverty
poverty (-1)	-0.218**(0.108)	-0.220***(0.056)
Food Inflation	0.017**(0.008)	0.055***(0.012)
lner	1.088*(0.614)	0.370(0.596)
lngdp	5.137***(1.959)	2.540(1.661)
lnwage	0.613***(0.228)	-2.160***(0.713)
hdi	-1.611***(0.193)	-0.705***(0.086)
Constant	0.242***(0.082)	-0.050(0.095)
Obs	340	330
Overidentification test (Hansen Test)	0.235	0.370

Note: (1) Estimation was conducted using the Two-step System GMM method; (2) Standard errors are in parentheses; (3) ***), **), and *) indicate statistical significance at the 1%, 5%, and 10% levels, respectively.
Source: Author's data processing results

Table 7: Impact of inflation on poverty in Western and Eastern Indonesia.

The rise in food prices exacerbates poverty Eastern Indonesia because most low-income households spend a large portion of their income on purchasing food. When food prices rise, their expenditure on these basic need increases, reducing their purchasing power for other necessities such as education, healthcare, and productive investments. This result is further reinforced by the relatively high poverty rates eastern Indonesia compared to western Indonesia. For instance, the poverty rate in some eastern Indonesia regions, such as Bali & Nusa Tenggara, reached 13.29 percent, and Papua recorded 20.68 percent in 2023. In contrast, the poverty rate in the western Indonesia region was 8.29 percent.

Additionally, geographic disparities within Indonesia illustrate the varying degrees of impact related to food inflation. In less developed regions, such as Eastern Indonesia, the reliance on subsistence farming makes households particularly susceptible to fluctuations in food prices. Here, food inflation does not just impact purchasing decisions; it critically undermines food self-sufficiency and economic stability (Pangesti et al., 2023). By contrast, Western Indonesia, characterized by more developed agricultural sectors and better infrastructure, may cushion some of the impacts of food inflation due to a more diversified economy that can absorb such shocks better (Deski et al., 2022).

Conclusion

This study examines the impact of food price inflation on poverty in Indonesia, focusing on regional disparities. The findings demonstrate that rising food prices significantly increase poverty levels, with the effect being more pronounced in rural areas compared to urban areas. Rural households, due to their higher reliance on food expenditures and lower income buffers, are particularly vulnerable to food price fluctuations. In contrast, urban areas show greater resilience, largely due to higher incomes and more diversified economic activities. Furthermore, the study reveals that the impact of food inflation on poverty is more severe in Eastern Indonesia, where economic development is less advanced, compared to Western Indonesia. This regional variation highlights the importance of considering local contexts when analyzing the effects of food inflation, as more developed regions tend to have better mechanisms to buffer the negative impacts. These results align with global studies that show food inflation exacerbates poverty, particularly in regions with weaker economic foundations. However, the findings of this research also underscore the necessity of addressing regional disparities, as the effects of food inflation are not uniform across the country. In less developed areas, food price increases can lead to higher poverty rates, not just through direct consumption impacts but also by limiting access to essential services like education and healthcare. This study contributes to the broader understanding of how food inflation interacts with regional economic conditions, emphasizing that national-level policies may not be sufficient to address the unique challenges faced by different regions.

Based on these findings, it is recommended that the Indonesian government adopt region-specific strategies to mitigate the impact of food inflation. In rural areas, particularly in Eastern Indonesia, where food inflation disproportionately affects poverty due to higher reliance on food expenditures and weaker social safety nets, targeted interventions such as food subsidies, direct cash transfers, and food assistance programs are essential. Strengthening regional infrastructure, especially in Eastern Indonesia, by improving food distribution networks and investing in agricultural

infrastructure, will enhance resilience against food price shocks. Moreover, regional development policies should focus on reducing the economic and infrastructure gaps between Western and Eastern Indonesia, promoting rural economic diversification through better access to education, healthcare, and support for small-scale agro-industries. These efforts, tailored to the specific needs of each region, will help mitigate the severe consequences of food inflation on poverty, particularly in the most vulnerable areas.

Despite the valuable insights provided by this study, there are several limitations that should be acknowledged. One limitation is the focus solely on food inflation, while other factors, such as income inequality, labor market conditions, and external economic shocks, may also significantly affect poverty dynamics. Future research could explore the interaction between food inflation and these factors, providing a more comprehensive understanding of the drivers of poverty. Additionally, the study's findings suggest that regional disparities play a crucial role in the impact of food inflation, yet the effectiveness of specific regional policies in mitigating these effects remains underexplored. Further research could investigate how targeted regional interventions, particularly in Eastern Indonesia, can better address the unique challenges posed by food inflation.

Corresponding author:
Misbahol Yaqin, S.E., M.S.E
Jalan Kalimantan, Kampus Tegal Boto
Jember, East Java, 68121, Indonesia
Email: misbahol.yaqin@unej.ac.id

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Appendix 1.

To get the full data that we used in this paper, please access this link: https://unej.id/-zZnBBe