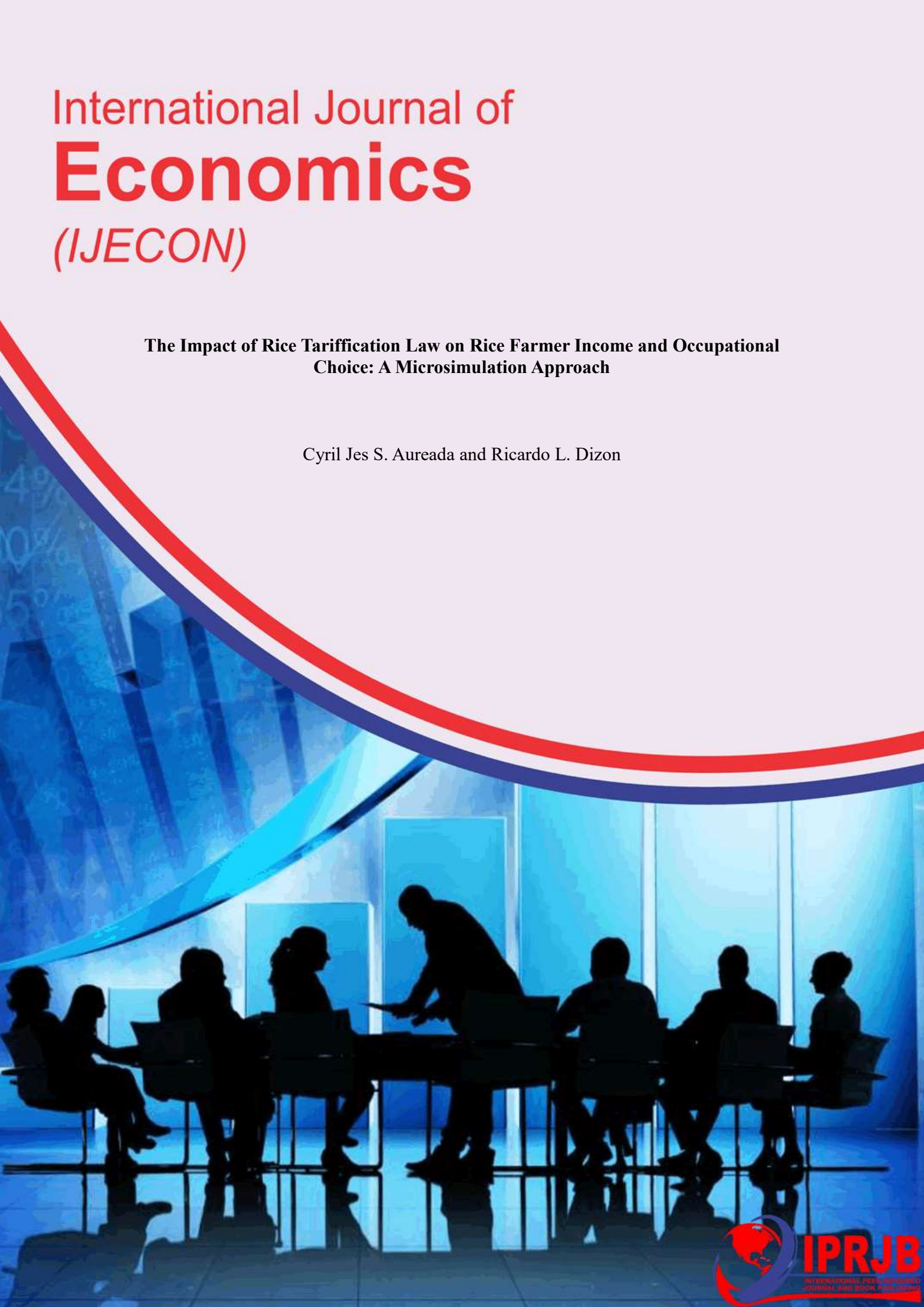
International Journal of
Economics
(IJECON)

The Impact of Rice Tariffication Law on Rice Farmer Income and Occupational Choice: A Microsimulation Approach

Cyril Jes S. Aureada and Ricardo L. Dizon



IPRJB

International Journal of Economics
ISSN 2518-8437 (Online)
Vol.9, Issue 3, No.4. pp 49 - 65, 2024

www.iprjb.org

The Impact of Rice Tariffication Law on Rice Farmer Income and Occupational Choice: A Microsimulation Approach

Cyril Jes S. Aureada[1*],
Master of Science in Economics, Polytechnic University of the Philippines Graduate School
Ricardo L. Dizon[2]
Doctor in Economics, Department of Economics, Polytechnic University of the Philippines, Manila, Philippines

Article History

Received 17th July 2024

Received in Revised Form 19th August 2024

Accepted 24th September 2024

How to cite in APA format:
Aureada, C., & Dizon, R. (2024). The Impact of Rice Tariffication Law on Rice Farmer Income and Occupational Choice: A Microsimulation Approach. *International Journal of Economics*, *9*(3), 49–65. https://doi.org/10.47604/ijecon.2961

Abstract

Purpose: This study was conducted to provide an ex-ante analysis of the impact of the Rice Tariffication Law (RTL) on rice farmers' income and occupation preferences. The study aims to determine how much increased in terms of total income before and after the implementation of RTL. Moreover the research aims to determine if how many farmers will shift to any industry after the implementation of RTL.

Methodology: Using microsimulation modeling and logistic regression a microdata from the 2018 Family Income and Expenditure Survey (FIES) were used to simulate changes in total income and household-level expenditures.

Findings: It was found that households whose heads were involved in agricultural activities and had more years of education had the highest income in the 2018 FIES. In the microsimulation model, it was observed that the implementation of the Rice Tariffication Law resulted in a noteworthy 52% increase in the total income of rice farmers who were recipients of the law, while non-recipients experienced a negative 19% change in their income. Moreover, an estimated 3,000 non-rice farmers transitioned to rice farming as income increased in rice farming activities.

Unique Contribution to Theory, Practice and Policy: This study recommends the effective allocation and implementation of the Rice Competitiveness Enhancement Fund (RCEF) to benefit rice farmer recipients and promote inclusive growth for our farmers. Government institutions should promote microfinancing and strengthen cooperative systems to aid in the allocation of cash disbursement. The establishment of community-based offices focusing on the RCEF program will ensure that the program is accessible to farmers. Additionally, RCEF credit assistance should be considered for future study to assess the government's efficiency in implementing the program and whether the allocated fund is sufficient for all rice farmers in the country.

Keywords: *Microsimulation, Tariffication Law, Occupational Choice, Rice Farmers' Income*

International Journal of Economics
ISSN 2518-8437 (Online)
Vol.9, Issue 3, No.4. pp 49 - 65, 2024
www.iprjb.org

INTRODUCTION

Rice is regarded as the staple food for a significant portion of the world's population, accounting for approximately 20 percent of the total global daily consumption according to Durand-Morat et al. (2020). Sixty-five percent of 1.7 billion people in Southeast Asia are living in rural areas relying on agricultural livelihood reported by IRRI, (2017). Annually, the worldwide production of paddy rice was estimated to exceed 715 million tons, resulting in 480 million tons of milled rice. The international rice market faces challenges due to its heavy reliance on domestic consumption within individual countries. As a consequence of this reliance, rice prices exhibit significant volatility. To safeguard their domestic rice producers and ensure national food security, numerous Asian nations have enforced stringent policies on rice importation elaborated by Sugimoto et al. (2014).

Intal et.al (2005), Briones et. al (2015), and Balisacan (1995) arrived at the consensus that the rice sector significantly influences the political landscape as it serves as the primary commodity, staple food, and major calorie source for the entire Filipino population. According to Papademetriou et al. (2000), the Philippines' rice productivity has declined over the years due to two main factors. Firstly, the fixed level of fertilizer has remained constant, leading to decreased productivity. Secondly, even with diminishing yields, a higher level of fertilizer must be added to maintain the same level of output. Cassman et al. (1995) concluded that the decline in productivity can be attributed to the degradation of the paddy resource base. At the same time, the country's population is rapidly increasing, leading to instability in domestic production and fluctuating prices. Due to insufficient domestically produced rice to meet the domestic demand, the government's sole option is to import rice from another country (Asian Journal, 2020).

The Philippine Congress has enacted a law, known as Republic Act No. 11203 or the Rice Tariffication Law (RTL), which aims to stabilize the rice supply in the market and ultimately reduce its price. The RTL appears to be beneficial for consumers, as it is pro-poor and results in lower rice prices. Nevertheless, local farmers face challenges due to intense competition from the international market. As noted by Tobias (2019), the increased rice supply may have adverse effects on our local farmers after the law's implementation. Therefore, to support the farmers, the government needs to provide substantial assistance.

Balie et al. (2020) and Briones (2020) agreed that the implementation of RTL has a positive impact on the prices and purchasing power of the consumer, while negatively impacting the producers. Estadilla (2022) argues that RTL has a potential compensation mechanism through tariff revenues. The Rice Competitiveness Enhancement Fund (RCEF) utilizes these revenues to enhance the productivity of rice growers through subsidies, infrastructure support, and modern machinery. Various perspectives on trade liberalization and diverse studies on tariffication law unanimously concur that the implementation of such laws facilitates a rise in rice supply while causing a reduction in rice prices within the market. Additionally, these viewpoints differ in their assessment of the law's impact on rice growers. This research aims to assess the ex-ante effect of the RTL on rice farmers' income at the consumer level. Furthermore, the study will conduct a comprehensive analysis to identify both positive and negative impacts, thus providing valuable insights for policy review and offering well-founded recommendations.

It has found out based on different studies the Philippines is facing a significant issue with declining rice productivity, which has worsened price volatility. Key factors include stagnation

in rice yields due to limited access to modern farming technologies, climate vulnerability, and high production costs. Growing demand from a rising population has further strained local production, often requiring imports that contribute to price fluctuations. As a result, supply instability and rising costs create a cycle of price volatility, making it difficult to maintain stable rice prices in the domestic market.

The researcher employs a microsimulation approach to assess the effects of the Rice Tariffication Law (RTL) on rice farmers' income and occupational choices, providing detailed, individual-level analysis. This method sheds light on how RTL impacts farmers, considering factors such as land size and market access, which is crucial in a diverse agricultural landscape like the Philippines. By modeling potential adaptations, such as shifting to different crops or occupations, it offers valuable insights into long-term socioeconomic shifts. Unlike existing studies focused on macroeconomic outcomes, this approach fills a gap by analyzing individual-level effects, enabling more targeted policy recommendations.

This research explores the impact of the Rice Tariffication Law (RTL) on farmers' income and occupational choices using a top-down microsimulation with a behavioral response model. It seeks to address gaps in understanding, particularly the characteristics of farmers' income and expenditure as reflected in the 2018 FIES. Additionally, the study aims to determine whether there is a significant difference between current and future farmers' net income and expenditure due to RTL, based on geographical location and RTL recipient status, and whether RTL has led to notable changes in rice farmers' occupational choices.

LITERATURE REVIEW

The Rice Tariffication Law on Farmers Income

Balie et al. (2020) conducted an assessment of the welfare implications of RTL. The study revealed that non-rice farmers experienced benefits due to the decrease in rice prices, as they are the primary purchasers of the commodity. Conversely, rice growers suffered a significant decline in welfare, experiencing a 7.7 percent reduction.Briones (2020) conducted a separate study on the impact of RTL on various worker groups. The researcher found out that in 2019, the income of agricultural workers decreased at a faster rate. However, after 2021, the rate of decline slowed down because of the reform. On the other hand, the income of industry workers experienced a drop in 2019 but showed accelerated growth in 2021.

Estadilla (2022) argued that rice growers were negatively affected by the policy reform. However, there is a potential compensation mechanism through tariff revenues. The Rice Competitiveness Enhancement Fund (RCEF) utilizes these revenues to enhance the productivity of rice growers through subsidies, infrastructure support, and modern machinery.Cororaton et al. (2020) employed a microsimulation model to analyze the effects of the RTL on domestic palay production. The study revealed a 4.4 percent increase in paddy production volume and a 5.6 percent increase in rice production. Moreover, Tobias (2019) conducted a separate study indicating that local rice farmers were adversely affected by the RTL, mainly due to the oversupply of inexpensive imported rice. While, Balie et al. (2020) utilized the 2015 FIES data to simulate the impact of rice tariffication reform on consumer and producer prices. The results indicated a significant reduction in consumer prices, approximately 17.4 percent, and a decrease in producer prices ranging from 13.6 percent to 22.6 percent, varying across regions and locations. This suggests that the law had both positive and negative effects on households and producers. Also, Briones (2019) examined the economic consequences of the RTL on the rice sector using the Computable General Equilibrium (CGE)

and Microsimulation Model. The findings revealed that the economic shocks to the rice sector led to an increase in income poverty across various industries. While the drop in retail prices, particularly for regular milled rice, benefited the poor, it also negatively impacted local farmers, leading to a decrease in income and an increase in poverty for them.

In Casinillo's study in the same year, various factors such as age, gender, household size, educational attainment, farm area, marital status, farm ownership, household consumption, and expenses were identified as influencing the farmer's income. Consequently, the increase in rice imports had a detrimental effect on the well-being of local rice farmers. The drop in rice prices due to the import surge meant that local farmers' income decreased as they faced the challenge of selling their harvest at lower prices while grappling with high costs for agricultural inputs. As a result, their income was insufficient to cover their monthly household expenses.

The Impact of the Law on Rice Farmers Job Determination

The implementation of the Rice Tariffication Law (RTL) increased the volume of imported rice during the fiscal year 2019. The Department of Agriculture reported that during the dry season, the average yield increased from 3.65 tons per hectare (t/ha) to 4.22 t/ha as a result of the RTL implementation from 2019 to 2021. In the wet season, the average yield rose from 3.69 t/ha in 2019 to 4.03 t/ha in 2021.However, Matai et al. (2019) concluded that after the implementation of the RTL, the supply of rice in the market increased while the price declined. Unfortunately, this phenomenon did not bode well for rice producers. This notion was supported by Briones in 2020, indicating that the net gain of the RTL to all Filipinos, while positive, comes at the expense of rice farmers and favors rice importers and wholesalers/retailers. This perspective is also corroborated by various studies from Valera G (2020), Cororaton and Yu (2019), and Balie et al. (2020), all of whom believed that the economic impact is more favorable for consumers than for producers.

In addition, the discussion from Cabling (2006), Dalwe (2006), and Moya et al. (2016) suggests that the lower local rice harvest can be attributed to the higher cost of production and a low supply of paddy in the country. This situation is critical as it leads to an increase in poverty and hunger across the Philippines, as noted by Palis (2020). Filipino rice farmers and their families often find themselves seeking other employment in urban areas, primarily in construction, food services, factories, and domestic work. While these jobs don't necessarily offer better income than rice farming, they do provide more stability and income security. The migration of farmworkers to cities results in abandoned farmland.

Taking consideration of the studies and analysis future researchers could enhance the microsimulation model. This could involve creating a dynamic microsimulation that incorporates essential variables like farmers' aging, inter-regional migration of farmers, and income mobility. Additionally, improving the micro-data used, such as employing longitudinal data sets, would be necessary for accurately recalibrating the identification of RTL status.

The effect of tariffs on trade is to serve as restriction barriers to entry to the domestic market to protect local industry, especially for agricultural products. A higher price creates an advantage for domestic producers who do not have to pay tariffs for their products sold locally. Estrella et al. (2022) study the effect of free trade in which the Philippines experienced rapid growth of imports, however, due to trade openness caused by trade liberalization weaken the country’s agricultural sector due to competitive imported goods. In addition, Briones (2020) studied the impact of trade liberation on income poverty and inequality in the country the study finds out that the domestic prices of rice have significantly fallen. The drop in retail and

wholesale prices also negatively impacted rice farmers in terms of poverty, and the government should take the distribution of income seriously.

Conceptual Framework

The study utilized a microsimulation model to evaluate the effect of The Rice Tariffication Law which is a newly mandated policy of the government. Microsimulation provides a holistic approach to simulating the welfare impact of the policy, specifically on the income of rice farmers, utilizing different sources discussed below.

Following the concept of the new trade theory and the impact of tariffs, the researcher determines the income effect of the law on our rice farmers after income estimation and microsimulation modeling. To evaluate how the RTL affected the income of rice farmers, as shown in Figure 2, a three-step approach was employed to analyze how the RTL influenced overall income distribution and choices of occupation.

The procedure encompassed three primary phases: (1) identification of the RTL specifications, (2) integration of the RTL into microsimulation for evaluating the policy's effect on the distribution of producer income, and (3) incorporation of multinomial logistic regression to measure how the RTL impacted occupational decisions among rice farmers.

The initial stage involved the identification of specifications of RTL that could directly impact the overall earnings of farmers throughout the simulated period. The guidelines for enacting the RTL are delineated in Article XIII of the Rice Competitiveness Enhancement Fund (RCEF). In order to boost the efficiency of rice farmers, the task of dispensing a range of rice farming machinery, such as tillers, tractors, seeders, threshers, rice planters, harvesters, irrigation pumps, compact solar irrigation systems, reapers, dryers, millers, and other beneficial devices, was undertaken by the Philippine Center for Postharvest Development and Mechanization (PhilMech).

Furthermore, the distribution of inbred rice seeds and seed growers to rice farmers falls under the jurisdiction of the Philippine Rice Research Institute (PhilRice). To offer financial assistance, the Land Bank of the Philippines (LBP) and the Development Bank of the Philippines (DBP) provide credit facilities with low interest rates and minimal collateral demands for rice farmers. The necessary seedlings and equipment for the program will be subsidized, and participating farmers will have access to credit support to address their daily expenses and livelihood requirements.

The researcher used the flow of the Microsimulation Model from Dizon, 2019 on the Impact of TRAIN Law as shown in table 2. The household was categorized based on several criteria. Firstly, their RTL recipient status was considered, classifying them as either recipients or non-recipients. Secondly, the head of the household's work classification from the national data was examined to determine whether they were engaged in farming or business. This classification included four categories: (a) 4- Employer in own family-operated farm or business, (b) 5- Worked with pay in own family-operated farm or business, (c) 6- Worked without pay in own family-operated farm or business. Thirdly, the class of workers identified in the data set was used for further grouping. This classification consisted of the following codes: (a) code 112- Growing of paddy rice, (b) 122- Growing of paddy rice, lowland, irrigated, (c) code 121- Growing of paddy rice, lowland, rainfed, (d) 123- Growing of paddy rice, upland/kaingin, and (e) 1061- Rice/corn milling. Lastly, geographical location, organized by region, was utilized as another factor for grouping the households.

International Journal of Economics
ISSN 2518-8437 (Online)
Vol.9, Issue 3, No.4. pp 49 - 65, 2024
www.iprjb.org

In the based period, the model integrated overall household expenditure and income. The net income was derived by deducting total household expenses from the total income prior to the implementation of RTL specification. The Heckman two-step selection method was used to gauge wage-based earnings. In the subsequent phase, the net income estimate was merged into the RTL specification, enabling the computation of projected alterations in total household income throughout the simulated period.

For the last stage, multinomial regression was integrated. Utilizing the estimated income after RTL the researcher will estimate the occupational choice movement of farmers among four categories (1) Wage (2) Entrepreneurial Rice Farming; (3) Entrepreneurial Non Rice Farming; and (4) Unemployed.

Empirical Framework

This study implemented a two-tiered procedure in determining the effect of the RTL to total income. The two-tiered procedure involved: (1) the determination of RTL specifications; (2) integration of RTL to microsimulation that determines the effect of the policy to income distribution of the farmers. In the second stage, the total farmers' net income was estimated before the implementation of the RTL. This study assumed that total income and total expenditure are aggregated from wages and income from different sources. The estimated net income from total income and expenditure was utilized in the Heckman two-step selection model.

The Heckman two-step selection model was employed to estimate net income from total income and expenditure. To identify the workers, a double filtration process was used. The first filtration involved classifying individuals into one of four categories: (a) 4- Employer in own family-operated farm or business, (b) 5- Worked with pay in own family-operated farm or business, (c) 6- Worked without pay in own family-operated farm or business. The second filtration involved the use of specific codes: (a) code 112- Growing of paddy rice, (b) 122- Growing of paddy rice, lowland, irrigated, (c) code 121- Growing of paddy rice, lowland, rainfed, (d) 123- Growing of paddy rice, upland/kaingin, and (e) 1061- Rice/corn milling.

After applying the filtration process, the next step involves estimating the employment status as either rice farmers or non-rice farmers using probit logistic regression for the selection equation

$$s_i^* = \gamma Z_i + u_i \tag{1}$$

$$s_i \begin{cases} 1 & if \quad s_i^* > 0 \\ 0 & if \quad s_i^* > 0 \end{cases} \tag{2}$$

Where, s_i^* refers to the selection of an individual to be rice farmers (1) or non rice farmers (0) given a suitable selection based from filtration applied.

The second step was the prediction of the natural logarithm of net income incorporating the estimated employment status. Moreover, this study used an Inverse Mill Ratio (Dizon, 2020) to account for the selection bias in the model. This is given by the equation:

$$log\ w_{mi} = a_{g(mi)} + x_{mi}\beta_{g(mi)} + v_{mi} \tag{3}$$

The log of wage, $log\ w_{mi}$ of member i of household m is a function of personal characteristics x i.e. age, sex, marital status, region, urban classification, and number of children.

International Journal of Economics
ISSN 2518-8437 (Online)
Vol.9, Issue 3, No.4. pp 49 - 65, 2024
www.iprjb.org

The occupational determination of the farmers was composed of four categories such as: (1) Wage (2) Entrepreneurial Rice Farming; (3) Entrepreneurial Non Rice Farming; and (4) Unemployed. The individual farmer's household labor supply was estimated using the multinomial logistic regression model which represents the discreet-utility maximizing framework. The estimated equation is shown below:

$$ln\frac{P(E_i=m)}{P(E_i=3)} = \alpha_m + \sum_{j=1}^{J}\beta_{mj}X_{ij} + u_{ij} = Z_{mi} \quad (4)$$

The Z_{mi} represents the actual individual utility function associated with each occupational choice. The notation X_{ij} represents the individual's characteristics such as area of classification (urban/rural), number of children, marital status, gender, education, and estimated income.

After estimating the individual actual utility associated with each occupational choice, the probabilities associated with each occupational choice are estimated which is represented by the equation:

$$P(E_i=3) = \frac{1}{1+\sum_{m=1}^{m=3} exp\, Z_{mi}} \quad (5)$$

$$P(E_i=m) = \frac{\exp Z_{mi}}{1+\sum_{m=1}^{m=3}\exp Z_{mi}} \quad (6)$$

Equations 5 and Equation 6 show the individual probabilities of being in one of the four categories for the reference category (4 = unemployed), and for other reference categories, respectively. The individual changes his occupational status according to his probability, where the individual prefers to work if the utility associated with wage worker is higher than the utility associated with the other activities.

RESULTS AND FINDINGS

The coefficients in Table 1 are derived from the estimated net income equation. The variables region, urbanization, and marital status have p-values lower than the five percent level of significance, indicating their statistical significance. On the other hand, the variables sex and education have p-values greater than the five percent level of significance, suggesting they are not statistically significant. Specifically, region and education show a positive effect on the logarithm of net income, while the other variables have a negative effect.

Geographical location such as region have significant impact on the income classification of households. Highly urbanized region have more opportunities to improve household income ranking given that they have skills set that they can use to compete in the market (Azam 2016). Moreover, remote regions with low development have small chance of income advancement as their capacity to have greater opportunities to earn more is more adaptable in the city and highly urbanize region (Villejo et al., 2014).

International Journal of Economics
ISSN 2518-8437 (Online)
Vol.9, Issue 3, No.4. pp 49 - 65, 2024
www.iprjb.org

Based on the estimate reveled in table 1, farmers irrigating from regions CAR, I, II, III, and IVB experience higher net income, making them the most prosperous regions for agricultural rice farming in terms of geographical location. Conversely, regions with high urbanization, such as NCR, IVA, VII, and VIII, show a decrease in net income for rice farmers located in urban areas.Nowadays the gap of income between male and female has go down (Capuno, 2019). The status of female in the labor market is improving. There are more equal job opportunities for both gender the gender pay gap has been improving overtime (Conchada 2019). As implicated in the estimate above gender status is not statistically significant in determining the impact of net income among rice farmers.

Table 1: The Estimation of Rice Farmers Net Income

	Coefficient	**Standard error**
Dependent Variable: Logarithm of Net Income		
Region	4900.244***	945.2352
Urbanization	-64245.54***	15519.39
Sex HH Head	-25869.24*	19428.74
Marital Status	-25588.27**	12928.99
Highest Grade Completed	2394.966*	1770.898
Constant	292800.5	42228.67
		Wald Chi-Square:
Mill	0.000	56.39
		Probability :
rho	0.000	0.000
Sigma	240285.35	

Note: *p<0.1, **p<0.05, ***p<0.01

Based on the estimate reveled in table 1, farmers irrigating from regions CAR, I, II, III, and IVB experience higher net income, making them the most prosperous regions for agricultural rice farming in terms of geographical location. Conversely, regions with high urbanization, such as NCR, IVA, VII, and VIII, show a decrease in net income for rice farmers located in urban areas.Nowadays the gap of income between male and female has go down (Capuno, 2019). The status of female in the labor market is improving. There are more equal job opportunities for both gender the gender pay gap has been improving overtime (Conchada 2019). As implicated in the estimate above gender status is not statistically significant in determining the impact of net income among rice farmers.

Single individual has the flexibility of increasing their income as compared to married, separated or widowed individual as they have more opportunities to choose and decide for their careers. As for the others which have responsibilities for their children and has limited opportunities to quit and change job right away (Monsura, 2021). These individuals tends to be more committed to their job showing higher productivity on their respective job which lead them to a higher position (Lerman, 2002). Table 1, implicated that marital status is statistically significant in determining the net income of rice farmers as marital status increases the net income decreases. Moreover, education level positively influences net income in rice farming, with higher education, like completing college, leading to increased earnings. This

International Journal of Economics
ISSN 2518-8437 (Online)
Vol.9, Issue 3, No.4. pp 49 - 65, 2024
www.iprjb.org

phenomenon can be explained by human capital theories presented by Mincer (1958), Becker (1962), and Schultz (1961), which suggest that individuals with higher education and training tend to have higher productivity and can command higher wages.

During the simulated period, the total household income aligns with the expected trends and patterns outlined in the wage equation. Notably, both households that receive Rice Tariffication Law (RTL) benefits and those that do not, experienced increased total income in specific regions (I,II, VI, XIII,III,IVB,X,I,VIII, and XII). Some of these regions, namely I, II, III, and VI, are known as high-income regions based on the data.The incorporation of Rice Tariffication Law specifications into the model resulted in a notable increase in total income for households in the mentioned regions, whether they were RTL recipients or not. During the simulated period, the total household income aligns with the expected trends and patterns outlined in the wage equation. Notably, both households that receive Rice Tariffication Law (RTL) benefits and those that do not, experienced increased total income in specific regions (I,II, VI, XIII,III,IVB,X,I,VIII, and XII). Some of these regions, namely I, II, III, and VI, are known as high-income regions based on the data. The incorporation of Rice Tariffication Law specifications into the model resulted in a notable increase in total income for households in the mentioned regions, whether they were RTL recipients or not.

The recorded results for Regions XI, VII, NCR and BARMM indicated a negative change ranging from 0.07 to 0.68 percent decrease. These findings suggest that these regions predominantly consist of non-rice farmers who have not received subsidies from RTL. Consequently, their net income has significantly decreased. On the other hand, Regions II, VI, XIII, III, IVB, X, and I exhibited positive changes in net income, ranging from 61 to 16 percent increase for both RTL recipients and non-recipients.

Table 2: Household Income Based on the Estimation Model before and after RTL

Region	Based Period	Estimated Period	Change
II (Cagayan Valley)	19,882,150.00	31,962,920.00	60.76
VI (Western Visayas)	24,893,822.00	36,774,405.00	47.73
XIII (CARAGA)	11,769,373.00	15,323,605.50	30.20
III (Central Luzon)	43,161,264.00	52,956,945.10	22.70
IVB (MIMAROPA)	28,684,372.00	33,874,984.30	18.10
X (Northern Mindanao)	9,179,536.00	10,725,020.50	16.84
I (Ilocos Region)	30,734,909.00	35,601,184.40	15.83
VIII (Eastern Visayas)	6,685,517.00	7,473,130.40	11.78
XII (SOCCSKSARGEN)	14,146,292.00	15,699,444.50	10.98
IVA (CALABARZON)	3,627,442.00	3,780,716.45	4.23
CAR	52,674,480.00	54,437,492.04	3.35
V (Bicol Region)	10,279,790.00	10,548,307.88	2.61
IX (Zamboanga Peninsula)	13,937,028.00	14,298,924.56	2.60
XI (Davao Region)	31,470,045.00	29,267,141.85	-0.07
VII (Central Visayas)	2,233,878.00	1,921,135.08	-0.14
National Capital Region	210,805.00	143,347.40	-0.32
BARMM	1,993,269.00	637,846.08	-0.68
Total Household Net Income	**305,563,972.00**	**355,426,551.04**	**0.16**
Recipient Status			
Rice Farmers	305,563,972.00	463,009,018.00	0.52
Non-Rice Farmers	399,502,424.00	323,922,578.48	-0.19

Source: Author's Calculation Based on PSA FIES

This suggests that these regions have lower production costs, and with the implementation of RTL, expenses decreased while net income increased. Additionally, the number of rice farmers in the identified regions is relatively larger compared to the latter regions, particularly since these areas are rural and have irrigated rice fields. Analyzing the data specifically for rice farmers, it becomes evident that they are better off after the RTL implementation. Table 2 illustrated a 52% increase in the net income of rice farmers, whereas non-recipients experienced a decrease of 19%.

This disparity indicates that other farming activities did not fare as well after the implementation of RTL. In line with this result Balie et al. (2020) using microsimulation model observed that there is an increase of income and decrease of poverty incidence for those recipients of rice tariffication law with effect largely in rural areas and smaller in urban areas. Moreover, according to Cororaton (2004) based on simulation results when the government reduce and remove the quantitative restrictions it will lead to higher poverty incidence which the government should subsidize to reverse the effects to the affected groups.

The individual farmers' household labor supply was estimated using the multinomial logistic regression model which represents the discreet-utility maximizing framework. The occupational determination of the farmers was composed of four categories such as Wage, Rice Farming, Non Rice Farming, and Unemployed.

The findings revealed that region, age, and sex are associated with negative coefficients, indicating that the likelihood of being employed is less likely in a chosen job category is less probable compared to the base category of being unemployed. These results align with Colombo's (2010) study. Das (2012) also noted that acquiring capital through education no longer guarantees access to higher-quality jobs; certain worker groups may be excluded from better job opportunities not due to social unacceptability, but rather because of their lack of skills. Furthermore, when an increase in income, married, and have children, living in urban areas, and finished education suggest a higher probability of being employed in the wage sector as compared to the base category.

The statistics presented in Table 3 suggested that the model is well-fitted, as evident from the likelihood ratio test p-values being 0.00. The likelihood ratio test examines whether all predictor regression coefficients in the model are collectively equal to zero, with reference to the base outcome (unemployed, category 4). The regression results revealed that for the wage sector (category 1), the explanatory variables—namely, region, no. of children, sex, age, and marital status, were statistically significant in various comparisons at a 5% level of significance, with each coefficient showing distinct variations.

International Journal of Economics
ISSN 2518-8437 (Online)
Vol.9, Issue 3, No.4. pp 49 - 65, 2024
www.iprjb.org

Table 3: Multinomial Regression Result of the Occupational Choice of Farmers after RTL

Dependent Variable: Workers Occupational Choice	**Coef.**	**Std. Err.**	**z**
1- Wage Workers			
Net Income	0*	0	0.35
Region	-0.0040509**	0.0016968	-2.39
Urbanization	0.020173*	0.0161529	1.25
No. Children	0.0242138***	0.0242138	4.44
Sex of HH Head	-1.442759***	0.0196091	-73.58
Age of HH Head	-0.0885943***	0.0006678	-132.7
Marital Status of HH Head	0.2131413***	0.0148495	14.35
Education	0.0044208*	0.0027215	1.62
Constant	6.704436***	0.0577689	116.06
2- Entrepreneurial Non-Rice Farming			
Net Income	0***	0	39.77
Region	0.0243732***	0.0017066	14.28
Urbanization	0.6319132***	0.0167136	37.81
No. Children	0.0511153***	0.0054963	9.3
Sex of HH Head	-0.9727304***	0.0195698	-49.71
Age of HH Head	-0.0539204***	0.000653	-82.57
Marital Status of HH Head	0.1554935***	0.0151697	10.25
Education	-0.0216841***	0.0027033	-8.02
Constant	2.978808***	0.05735	51.94
3- Entrepreneurial Rice Farming			
Net Income	0***	0	35.78
Region	-0.0309162***	0.0030446	-10.15
Urbanization	0.7737009***	0.0320249	24.16
No. Children	-0.0331958***	0.0100385	-3.31
Sex of HH Head	-1.438753***	0.0439623	-32.73
Age of HH Head	-0.0423839***	0.0011589	-36.57
Marital Status of HH Head	0.0204255*	0.0310047	0.66
Education	0.0101191**	0.0048593	2.08
Constant	1.365382***	0.1094111	12.48
4- Unemployed	(base outcome)		

Source: Author's Calculation Based on PSA FIES

The statistics presented in Table 3 suggested that the model is well-fitted, as evident from the likelihood ratio test p-values being 0.00. The likelihood ratio test examines whether all predictor regression coefficients in the model are collectively equal to zero, with reference to the base outcome (unemployed, category 4). The regression results revealed that for the wage sector (category 1), the explanatory variables—namely, region, no. of children, sex, age, and marital status, were statistically significant in various comparisons at a 5% level of significance, with each coefficient showing distinct variations.

The findings revealed that region, age, and sex are associated with negative coefficients, indicating that the likelihood of being employed is less likely in a chosen job category is less

International Journal of Economics
ISSN 2518-8437 (Online)
Vol.9, Issue 3, No.4. pp 49 - 65, 2024
www.iprjb.org

probable compared to the base category of being unemployed. These results align with Colombo's (2010) study. Das (2012) also noted that acquiring capital through education no longer guarantees access to higher-quality jobs; certain worker groups may be excluded from better job opportunities not due to social unacceptability, but rather because of their lack of skills. Furthermore, when an increase in income, married, and have children, living in urban areas, and finished education suggest a higher probability of being employed in the wage sector as compared to the base category.

As the net income increases for married individuals with more children in rural areas and higher regions, there is a higher likelihood of opting for non-rice farming over other occupations. On the other hand, for married individuals with lower numbers of children, higher education, and residing in rural areas, the probability of choosing rice farming increases with a rise in net income. Table 3 presents the anticipated shifts in household occupational status, transitioning from unemployment to various options like wage worker, non-rice farming, and rice farming. These shifts are determined by comparing the utility generated from each occupational choice, with individuals selecting the option that offers the highest level of utility. The probability of joining rice farming and wage sector is more likely to happen when income increases for married, male and living in rural areas having more children.

Table 4: Farmer's Aggregated Number of Farmers Occupational Movement after the Implementation of RTL

Region	BEFORE RTL				AFTER RTL				PERCENTAGE CHANGE			
	Wage	Non Rice Farming	Rice Farming	Unemployed	Wage	Non Rice Farming	Rice Farming	Unemployed	Wage	Non Rice Farming	Rice Farming	Unemployed
Region I	2413	1241	835	1403	2415	1283	1331	1626	0.00	0.03	0.59	0.16
Region II	2733	2220	235	1090	2761	2236	367	1168	0.01	0.01	0.56	0.07
Region III	5593	2676	479	3059	5609	2701	744	3279	0.00	0.01	0.55	0.07
Region IVA	3587	1743	248	1775	3614	1762	335	1929	0.01	0.01	0.35	0.09
Region IVB	3396	2696	301	1556	3422	2720	459	1682	0.01	0.01	0.52	0.08
Region V	3224	2786	290	1899	3253	2822	434	2023	0.01	0.01	0.50	0.07
Region VI	4568	2960	584	2568	4594	2976	964	2770	0.01	0.01	0.65	0.08
Region VII	3716	2356	144	1840	3729	2367	178	1960	0.00	0.00	0.24	0.07
Region VIII	3807	3453	275	1974	3844	3478	392	2122	0.01	0.01	0.43	0.07
Region IX	2335	2181	193	1114	2373	2218	288	1141	0.02	0.02	0.49	0.02
Region X	4221	2714	350	1811	4271	2760	524	1920	0.01	0.02	0.50	0.06
Region XI	3841	2348	454	1627	3900	2422	673	1740	0.02	0.03	0.48	0.07
Region XII	3329	2617	305	1197	3379	2644	441	1306	0.02	0.01	0.45	0.09
Region XIII	3163	2477	287	1660	3194	2504	432	1774	0.01	0.01	0.51	0.07
NCR	10190	2728	238	4821	10191	2729	242	5079	0.00	0.00	0.02	0.05
CAR	3297	2922	630	1689	3389	2998	996	1817	0.03	0.03	0.58	0.08
BARMM	1680	4710	216	649	1689	4722	316	666	0.01	0.00	0.46	0.03

Source: Author's Calculation Based on PSA FIES

Table 4 revealed a relatively conservative number of farmers who moved in household occupational choices across several regions, including Regions 1, 2, 3, 4 (A and B), 5, 6, 8, 9, 10, 12, NCR, CAR, CARAGA, and MIMAROPA. Notably, the CALABARZON region exhibits the most significant changes in labor occupational choices, attributed to the implementation of RTL. Total household income exhibited a significant increase in Table 6, as

evidenced by a p-value of 0.000, indicating a level of significance of less than 5 percent. The predicted change in household occupational status from being unemployed to the other occupational choices such as employed, non- rice farming, and rice farming. The movement in occupational status is being determined by comparing the utility generated from each occupational choice (Dizon, 2019).

The individual will choose occupational choice which will yield highest level of utility. To test if there are significant differences in the rice farmer income and occupational choice, the paired sample t-test was utilized. The paired samples t-test compared two means that are from the same individual, object, or related units. It represented the pre-test and post-test of an in intervention, particularly, the RTL. The paired samples t-test aims to determine whether there is statistical evidence that the mean difference between paired observations is significantly different from zero.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The implementation of the Rice Tariffication Law resulted in a noteworthy 52% increase in the total income of rice farmers who were recipients of the law, while non-recipients experienced a negative 19% change in their income. The findings jibed with the results of the simulation that the implementation of RTL results to higher income of the rice farmers. The result give us the conclusion that there is a significant difference of rice farmers income and expenditure after the implementation of RTL. The average income before the implementation of RTL is at 11, 643 pesos based on the microsimulation modelling and the implementation of RTL the average monthly income of rice farmers increase by 52% that leads to 17,684 pesos. As the results revealed regions II, VI, CARAGA, III, I and VI have the highest income increase for about 15,000 pesos to 50,000 pesos monthly income for our rice farmers.

Following the implementation of the Rice Tariffication Law it was estimated that there was a significant increase of rice farmers, equivalent to 3,000 farmers, who transitioned to rice farming from different job category.

Recommendations

1. Based on literature and statistical results RCEF is the key to countering the impact of RTL on our rice farmers. The fund should be allocated wisely and effectively from top to bottom. There should be no room for bureaucratic red tape in the implementation of RCEF to our farmers. The government specifically Congress should ensure that RCEF programs are being allocated, distributed and given to the rice farmers. By building LGU offices assigned and focus on RCEF programs will mitigate the bureaucracy because the allocation and implementation of the program will be going straight to our farmers and avoiding to pass thru some levels such us province, districts, LGU and barangay levels that might result to corruption.
2. The RCEF cash assistance should also be increased gradually it should be revisit if 10 million allocation is still enough after 5 to 10 years so that it will directly impact the income of rice farmers. DBP and LBP should also promote microfinancing and strengthening the cooperative systems to help in allocation of cash disbustment.

3. Department of Agriculture should established community based or LGU offices that focus on RCEF program. This will ensure that the implementation of the program is accessible to the farmers such as seedling and machinery distribution. Stable supply of inputs for our farmers is a big help for them to ensure their production and respond to the increasing production cost. By stablsihing local satellite offices they can facilitate forming organization for single farmers to collaborate with other farmers in producing rice in a large scale that will result a larger volume of output and productivity in the region. This will encouraged to increase their production and increase their market share for local and organic rice.
4. The rate of quantitative restriction should be revisited by the Office of the President as the rice farmers are still adjusting the competition between local rice and imported are very disadvantages for farmers.
5. The government should support the income diversification by stablishing rural investment so that farmers have other options whenever the palay prices fall.
6. TESDA should impart financial literacy to our rice farmers on top of the skills training as mandated by the law.
7. Like other professional track, the researcher believed that professionalizing the agricultural sector will help the country to boost its domestic supply and promote agricultural advancement in the future.
8. The researcher also believed that RCEF-credit assistance should also be considered for future study as its for the benefit of all to know if the government is being efficient in implementing, the program and if the 10 billion allocation is enough for all the rice farmers in the country.

REFERENCES

Abansi, C. L., Duff, B., Lantican, F. A., & Juliano, B. O. (1992). Consumer demand for rice grain quality in selected rural and urban markets in the Philippines. Consumer Demand for Rice Grain Quality: Terminal Report of IDRC Projects National Grain Quality (Asia) and International Grain Quality Economics (Asia), 37-57.

Arida, I. A. (2009). Problems in rice farming: a Filipino farmers' perspective. Philippine Journal of Crop Science (Philippines).

Balié, J., & Valera, H. G. (2020). Domestic and international impacts of the rice trade policy reform in the Philippines. Food Policy, 92, 101876.

Balié, J., & Valera, H. G. (2020). Domestic and international impacts of the rice trade policy reform in the Philippines. Food Policy, 92, 101876.

Balié, J., & Valera, H. G. (2020). Is COVID-19 a threat to the stability of rice price and supply.

Balié, Jean; Minot, Nicholas; and Valera, Harold Glenn. 2020. Distributional impact of the rice tariffication policy in the Philippines. IFPRI Discussion Paper 1962. Washington, DC: International Food Policy Research Institute (IFPRI). https://doi.org/10.2499/p15738coll2.133994

Chivenge, P., & Sharma, S. (2019, August). Precision agriculture in food production: Nutrient management. In International workshop on ICTs for precision agriculture (Vol. 12).

Cororaton, C. B. (2004). Rice reforms and poverty in the Philippines: a CGE analysis (No. 57). ADBI Research Paper Series.

Cororaton, C. B., & Cockburn, J. (2007). Trade reform and poverty—Lessons from the Philippines: A CGE-microsimulation analysis. Journal of Policy Modeling, 29(1), 141-163.

Cuevas, R. P., Pede, V. O., McKinley, J., Velarde, O., & Demont, M. (2016). Rice grain quality and consumer preferences: a case study of two rural towns in the Philippines. PloS one, 11(3), e0150345.

Danso-Abbeam, G., & Baidoo, F. (2014). Determinants of Consumer Preference for Local Rice in Tamale Metropolis, Ghana.

Datoon, R. (2016). RURAL INDUSTRIALIZATION AND THE DE-FEMINIZATION OF RICE FARMING, THE CASE OF A VILLAGE OUTSIDE THE FREEPORT AREA OF BATAAN. Journal of Management and Development Studies, 5(1), 1-1.

David, C. C., & Balisacan, A. M. (1995). Philippine rice supply demand: prospects and policy implications (No. 1995-28). PIDS Discussion Paper Series.

Department of Agriculture. DA Bulletin No. 1.Rice: Understanding the Rice Tariffication Law (RTL) or RA 11203.https://www.da.gov.ph/understanding-the-rice-tariffication-law-rtl-or-ra-11203-and-its-ramifications/

DIZON, R. L. (2021). Tax Incidence of Philippine Tax Reform: Poverty and Distributional Effect. The Journal of Asian Finance, Economics, and Business, 8(2), 281-288.

Evangelista, J., Estrella, N. M., & Suin, K. A. (2022). Trade Liberalization: Reaping Its Effects on the Agricultural Performance of the Philippines. Journal of Economics, Finance and Accounting Studies, 4(1), 131-149.

Fernandez, D. (2014). Threats and challenges to agriculture towards sustainable rice farming. Asia Pacific Journal of Education, Arts and Sciences, 1(1), 1-1.

Galawat, F., & Yabe, M. (2010). Assessing Consumer's Preference for Local Rice in Brunei: An Application of Choice Model. J. ISSAAS, 16(2), 104-115.

Gregorioa, G. B., & Ancog, R. C. (2020). Assessing the impact of the covid-19 pandemic on agricultural production in Southeast Asia: toward transformative change in agricultural food systems. Asian Journal of Agriculture and Development, 17(1362-2020-1097), 1-13.

Kajisa, K., & Akiyama, T. (2005). The evolution of rice price policies over four decades: Thailand, Indonesia and the Philippines. Oxford Development Studies, 33(2), 305-329.

Kareem, B., Awopetu, O. O., Oke, P. K., Akinnuli, B. O., Ayodeji, S. P., & Mogaji, P. B. (2010). Modelling Demand and Supply of Cocoa Produce in Nigeria using Regression Method. In Proceedings of the World Congress on Engineering (Vol. 3).

Kundu, A. (2020). Impact of trade liberalisation on formal–informal interlinkages in India: does sectoral labour mobility matter?. Journal of Economic Structures, 9(1), 1-29.

Mangabat, M. C. (1998). Effects of Trade Liberalization on Agriculture in the Philippines: Institutional and Structural Aspects (No. 1438-2016-118952).

Meller, P. (1992). Review of the Chilean trade liberalization and export expansion process (1974-90). The Bangladesh Development Studies, 155-184.

Ogundele, F. (2007). Trade liberalization and import demand for rice in Nigeria: A dynamic modelling. Journal of Rural Economics and Development, 16(1623-2016-134883), 34-45.

Pacheco-López, P., & Thirlwall, A. P. (2004). Trade liberalisation in Mexico: rhetoric and reality (No. 04, 03). Department of Economics Discussion Paper.

Palis, F. (2020). Aging Filipino rice farmers and their aspirations for their children. Philippine Journal of Science, 149(2), 351-361.

Perez, N., & Pradesha, A. (2019). Philippine rice trade liberalization: Impacts on agriculture and the economy, and alternative policy actions. Intl Food Policy Res Inst.

Philippine Congress, Housebill #4625.AN ACT MANDATING RICE RETAILERS TO IDENTIFY LOCALLY PRODUCED RICE AS PRODUCED BY FILIPINO FARMERS, AND APPROPRIATING FUNDS THEREFOR. https://hrep-website.s3.ap-southeast-1.amazonaws.com/legisdocs/basic_18/HB04625.pdf

Robbins, D. (2003). The impact of trade liberalization upon inequality in developing countries-A review of theory and evidence. Documentos de EconomÃa, (003601).

Santiago Jr, F. A. (2015, March). A historical evaluation of the emergence of Nueva Ecija as the rice granary of the Philippines. In Proceedings of the DLSU Research Congress.

Santos, M. D., Clemente, M. O., & Gabriel, A. G. (2018). A Comparative Analysis of Farmgate and Regulated Prices of Palay in Nueva Ecija, Philippines: A Policy Revisited. Open Journal of Social Sciences, 6(03), 50.

Tallada, J. G. (2019, August). Precision agriculture for rice production in the Philippines. In INTERNATIONAL WORKSHOP ON ICTs FOR PRECISION AGRICULTURE (p. 79).

Tolentino, V. (2002). Rice policy reforms in the Philippines: a political economy perspective. Policy Notes. Makati (Philippines): Philippine Institute for Philippine Studies. Dissemination of integrated natural resource management practices for lowland rice in the Philippines, 53.

Tolentino, V. B. J. (2002). The globalization of food security: Rice policy reforms in the Philippines. Philippine Journal of Development, 29(2), 27-61.

Tomlins, K. I., Manful, J. T., Larwer, P., & Hammond, L. (2005). Urban consumer preferences and sensory evaluation of locally produced and imported rice in West Africa. Food quality and preference, 16(1), 79-89.

Vertudes, M. F., Musa, C. D., Cosilet, M. A., Salagubang, R., & Balaria, F. (2020). Impact of rice tariffication law in selected rice farmers in nuevaecija, Philippines. International Journal of Advanced Engineering, Management and Science (ISSN: 2454-1311), 6(3), 147-153