



The policy effect of government assistance on the rice production in Southeast Asia: Comparative case studies of Thailand, Vietnam, and the Philippines

Thanapan Laiprakobsup

To cite this article: Thanapan Laiprakobsup (2019) The policy effect of government assistance on the rice production in Southeast Asia: Comparative case studies of Thailand, Vietnam, and the Philippines, Development Studies Research, 6:1, 1-12, DOI: [10.1080/21665095.2019.1568900](https://doi.org/10.1080/21665095.2019.1568900)

To link to this article: <https://doi.org/10.1080/21665095.2019.1568900>



© 2019 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 22 Jan 2019.



Submit your article to this journal [↗](#)



Article views: 164



View Crossmark data [↗](#)

The policy effect of government assistance on the rice production in Southeast Asia: Comparative case studies of Thailand, Vietnam, and the Philippines

Thanapan Laiprakobsup

Faculty of Political Science and Social Research Institute, Chulalongkorn University, Bangkok, Thailand

ABSTRACT

Government in Southeast Asia plays a crucial role in the rice sector. It intervenes in rice production in order to increase the country's production and to achieve self-sufficiency in rice production. How does the government's policy affect rice production? This paper examines the policy effect of government assistance on rice production in Southeast Asian countries and it argues that the less likely government is to impose tax barriers on the rice sector and to control prices, the more likely is rice production to increase. Studying the relation between rice policy and rice production in Southeast Asia, the paper finds that a decline in the state's tax intervention in the rice sector helps to increase rice production in both rice exporting and importing countries. In addition, the results show that political liberalization leads to an increase in rice production. Therefore, a reduction in tax barriers and the abandonment of the state's price control are state policies that encourage rice production in the long run.

ARTICLE HISTORY

Received 7 October 2018
Accepted 9 January 2019

KEYWORDS

Government; nominal rate of assistance; tax; rice production; Southeast Asia


I. Introduction

Government policy has an influence on farmers' rice production, and such policy can qualitatively affect the farmers' production in that the government provides production technology and knowledge for farmers so that they can improve their productivity in the long run. Quantitatively, the government's policy results in increasing rice production, especially the rice productivity of farmers. Southeast Asian countries (i.e. Vietnam and Thailand) are among the biggest rice exporters in the world market, while others (i.e. the Philippines or Indonesia) are among the biggest rice importers. The government has intervened in the rice market *via* several policy tools, and the government intervention in Southeast Asia can be roughly divided into subsidization and taxation. On the one hand, the government in Southeast Asia provides financial and production assistance for farmers *via* price guarantees or input subsidies (Anderson 2009b; Laiprakobsup 2010), and on the other hand, it imposes tax barriers on imported inputs and machines and controls rice prices (Anderson 2009b; Laiprakobsup 2010).

How does the government's policy or intervention affect farmers' rice production? Does the government's taxation discourage farmers from increasing their productivity? Does the government's subsidization contribute to growth of the farmers' productivity? Scholars have examined the relation between government

intervention and the agricultural market, especially in developing countries (Bates 1981; Kasara 2007; Anderson 2009a; Laiprakobsup 2013, 2014a), and their studies usually examine the effect of government policy on the agricultural export market in that the abandonment of taxation contributes to growth in agricultural exports or trade liberalization. This paper examines the relation between the government's policy and the farmers' rice production in rice-exporting and rice-importing countries in Southeast Asia, and it argues that the abandonment of taxation by the government contributes to an increase in rice production in that rice farmers are not imposed with taxes on inputs or production equipment, and they are not controlled by the government's price program. Therefore, they have incentive to increase their productivity since their production costs can be reduced.

The paper is divided into 6 sections. While the first section introduces the research's questions and the research's purpose, the second section reviews previous research on government intervention in the agricultural market. The third section briefly explains state intervention in the agricultural markets in Southeast Asia, and the fourth section explains the data and methods employed to examine the effect of government intervention regarding rice production. The fifth section presents the results from the statistical

CONTACT Thanapan Laiprakobsup  tlaiprakobsup@hotmail.com

© 2019 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group
This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

models while the sixth section discusses and concludes the paper.

II. Government intervention and the agricultural market in developing countries

Government intervention in agriculture can be divided into 2 periods. From the 1950s to the 1970s, the governments in developing countries intervened in agriculture *via* a set of trade policies. First, the government intervention aimed to protect consumers and industry from commodity price fluctuation at the expense of farmers' interests. They implemented different types of taxes to accrue revenues from agricultural commodity exports. The revenues were allocated to the government agencies and programs. For instance, in Thailand, the revenues from rice export taxes (i.e. rice premiums) were transferred to subsidize the government's agricultural extension programs for other crops (especially import-competing ones) (Siamwalla and Setboonsarng 1991). Second, the government frequently controlled agricultural commodity prices so that they were set much lower than those in the global market in order to protect consumers and industry from commodity price fluctuation. The government usually employed export restrictions to prevent commodity shortages in the domestic market, leading to rising food prices. India and Vietnam, for example, employed this measure in 2008 (global food price crisis) in order to control soaring rice prices in the domestic market (Bello 2009). Consumer subsidies were another policy which the governments in several countries were likely to use for controlling food prices. This required farmers to sell their commodities to government agencies at a lower price. The agencies then sold the commodities to consumers at a price much below the market price. Third, the government set higher protective tariffs in order to protect domestic industry and state enterprises from foreign competition. This setting of high tariff rates led to higher prices of imported commodities such as agricultural equipment or fertilizers. As a result of such high protective tariffs, farmers were negatively affected in that they had to purchase agricultural equipment and fertilizers at higher prices. Such government intervention negatively affected agricultural production. Laiprakobsup (2014b, 381) wrote about the effect of government intervention in the agricultural market.

"When the government imposes higher taxes on agricultural exports, it transfers resources (revenues and labors) from the agricultural sector to the industrial, urban, and even import-competing agricultural commodity sectors (Bates 1981; Haggard 1990). For instance, when the government implements consumer subsidy programs by

requiring the farmers to sell their commodities at a cheaper price, it transfers the farmers' incomes that they were supposed to earn to the consumers. Moreover, the government transfers tax burdens to the farmers via export taxes in that the agricultural industry is likely to purchase the farmers' commodities as cheaply as possible in order to make up for its cost."

Nonetheless, the governments in several developing countries have increasingly abandoned those policies and, sometimes, have subsidized agriculture, beginning in the 1980s. Direct taxes on agricultural production and consumer subsidy programs were abolished, and the governments in Brazil, the Philippines, and Thailand for example lifted direct taxes on their major agricultural exports and consumer subsidy programs (Warr and Kohpaiboon 2009). Regarding agricultural production, several developing countries have implemented short-term programs, such as production assistance or fertilizer subsidies. These agricultural shifts became more visible after the 1980s, when policymakers in developing countries gradually pursued market reform and trade liberalization (Anderson 2009a). The governments were pressured by the World Bank and the International Monetary Fund to reduce protective tariffs and the subsidization of state-owned programs in exchange for financial assistance (Laiprakobsup 2010). The effort to pursue market reform and the promotion of trade liberalization at the international level encouraged government to reduce direct taxes on agricultural exports.

III. Rice production in Southeast Asia in brief

After World War II, Southeast Asian countries faced two major problems: food shortage and underdevelopment. Having solved those problems, government intervened in the agricultural market. First, it intervened in agricultural production in order to reduce food shortage problems and to achieve self-sufficiency. It structurally changed agricultural production in that government promoted agricultural mass production and encouraged farmers to grow exportable commodities (Anderson 2009a). Having supported farmers to grow exportable commodities, government then invested in infrastructure programs, such as irrigation systems and roads, in order to transport commodities from the producers in rural areas, and it provided technological assistance, inputs at low costs, and rice varieties for producers. It encouraged farmers to change their productivity by using governmental-supported modified varieties which efficiently provided a greater average yield than local varieties. The government's agricultural investment from the 1960s to the 1970s or during what has been called the 'Green Revolution' illustrates state intervention

in rice production in developing countries. Thailand and the Philippines heavily invested in irrigation and production technology for rice farmers so that they could cultivate rice two times a year (Welsch and Tongpan 1971; Lawas and Korzan 1971). For exporting countries, state intervention in rice production aimed to increase their exports. Meanwhile, importing countries invested in rice production in order to prevent food shortages. Having faced political and ideological conflicts (i.e. the Cold War), the governments in Southeast Asia strictly controlled agriculture, however. Political leaders feared that price fluctuations of major food commodities (especially rice) could provoke mass protestation by urban consumers, and industry would not politically support the leaders. Therefore, the governments in Southeast Asia heavily intervened in the rice sector *via* tax barriers and price control (see Section II). In other words, Southeast Asian countries implemented two faces of policy: subsidizing rice production but controlling rice prices. On the one hand, they invested in rice production in rural areas, while on the other hand they strictly controlled rice prices in the domestic market.

By the 1980s, Southeast Asian countries began to increasingly help rice farmers *via* land distribution and production assistance programs. First, the governments in Southeast Asia began to distribute land rights to rice farmers in rural areas. Vietnam has allocated land rights to rice farmers since the mid-1980s so that now farmers are able to transfer their land rights (Haughton et al. 2004; Giesecke et al. 2013). The Vietnamese government implemented land reform policy in the mid to late 1990s, and it began to implement Land Law policy in 1993, which gave land rights to farmers for 20 years (Marsh and MacAulay 2006; OECD 2015). Then, the law was revised in 1998, 2001, and 2003. The new Land Law gave land tenure to farmers and allowed farmers to exchange, sell, lease, mortgage, and inherit their land (Marsh and MacAulay 2006; OECD 2015; Gavagnin, Zolin, and Pastore 2016). The Thai government has allocated land rights in several forms of land distribution to serve several types of land use and different types of poor farmers (Panichvejsunti et al. 2018), and the Philippine government has extensively reformed land tenure for farmers since 1987, right after the fall of Marcos. The land reform aimed to promote social justice for poor farmers and to reduce inequality (Vargas 2003).

Second, the governments in Southeast Asia began to support farmers' production *via* government assistance programs at the farm level. It usually allocates a small amount of money in order to reduce production costs. Vietnam has implemented 50,000 Vietnamese Dong per hectare since 2012 in order to help farmers' productivity. Regarding the Philippines, the government

supports farmers via rice variety and fertilizer subsidy programs. It allocates rice variety and fertilizer through farmers' cooperatives and farmers' associations.¹

In case of Thailand, the government has implemented several types of assistance programs for rice farmers. The most significant rice assistance program is the rice pledging scheme, which the government procures rice from farmers at the government-guaranteed prices (Laiprakobsup 2014b). Having mobilized political supports from rural voters (i.e. rice farmers), the Yingluck Shinawatra administration procured paddy rice from farmers at the price much higher than the market prices. In consequence, the rice-pledging scheme led to a flood of rice on the market that caused rice prices to fall. Thailand ended up with millions of tons of rice rotting in warehouses. The scheme became one of the major causes of political conflict in Thailand in the past years. It was criticized by the opposition party and the anti-Thaksin movement in terms of government leaders committing corruption in the scheme. By 2014, the military overthrew the Yingluck administration, and the rice pledging scheme was one of the reasons the military claimed for overthrowing the elected government.

Currently, the military government refuses to implement the rice pledging scheme, and turns to rice production assistance programs. In the 2016/2017 production season, the military implemented 1000 baht per rai in order to reduce farmers' production costs (Laiprakobsup 2017). In 2017/2018, the military increased the amount of money up to 1200 baht per rai. Currently, it increased the amount of production assistance up to 1500 baht per rai in order to politically appeal to rice farmers.

Other Southeast Asian countries also support rice farmers. Malaysia has invested in rice production by establishing rice estates. The government aimed to consolidate paddy rice production by encouraging rice farmers to join government-supported rice estates and providing assistance through farmers' associations in the estates (Najim et al. 2007). Accordingly, Malaysia was able to increase its rice production and stock by 200 percent, and it was able to reduce rice imports (Najim et al. 2007). In terms of marketing, the government established the state-owned company called Padi Beras National Berhad (BERNAS) or National Paddy and Rice Company Limited for buying paddy rice from farmers (Harun and Ariff 2017).

Figure 1 illustrates the trend of rice productivity in Thailand, Vietnam, and the Philippines. The rice productivity in those countries began to increase in the mid-1970s, when government invested in agricultural extension and rural development. However, rice productivity has gradually increased since 1980, when the

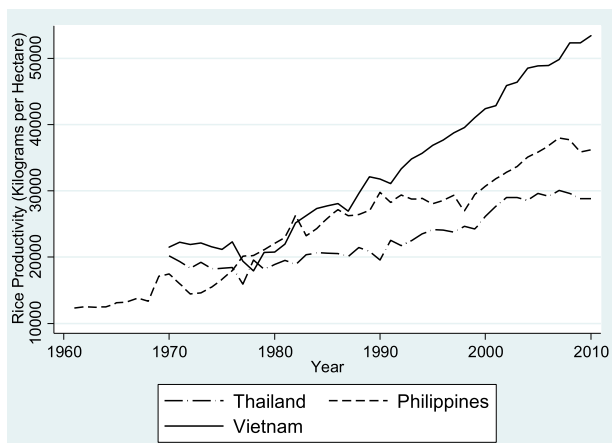


Figure 1. Trends of rice productivity in Thailand, Vietnam, and the Philippines. Source: FAO (2017a, 2017b, 2017c).

Southeast Asian countries began to abandon imposing taxes on agricultural commodities and controlling commodity prices and implementing trade liberalization regarding agriculture. The figures indicate the relation between government policy and rice production in Southeast Asia. Thus, the main hypothesis is that government assistance policy is associated with increased rice production.

Political and economic contexts

An agricultural policy shift in Southeast Asia occurred and changed the political and economic contexts there. From the 1980s to 1990s, the politics in Southeast Asian countries began to shift to more liberal regimes in different modes of political transition. In Vietnam, for example, even though the Communist Party strictly governed the country, there was a transition of the political leadership within the top Communist Party leaders. The party's leaders, who wanted to pursue a market reform policy, played an important role in the policymaking process in the mid-1980s (Gavagnin, Zolin, and Pastore 2016), while in Thailand, elected politicians in rural areas increasingly played an influential role in the policymaking process of the semi-democratic government under General Prem Tinnasulanon (Phongpaichit and Baker 2002). In the Philippines, Marcos was overthrown by the People's Movement, led by Corason Aquino in 1986, which led to a democratic transition since 1965. Regarding economic contexts, Vietnam, Thailand, and the Philippines structurally adjusted their economic system and liberalized their international trade (Haggard & Kaufman 1995), and the political leaders in these countries pursued market reform, even though the structural adjustment and market reform were not fully successful. These political and economic shifts led

to the abandonment of agricultural taxation and the implementation of agricultural assistance. In Vietnam, the allocation of land rights and the reduction of tax barriers were continuously implemented throughout the 1980s and 1990s. In Thailand, tax barriers on rice exports and quota restrictions were abolished in the late 1980s while the elected government in the Philippines abolished tax barriers on agricultural exports (Laiprakobsup 2013, 2014a).

IV. Data and methods

In order to operationalize and measure rice production in Thailand, Vietnam, and the Philippines, the dependent variable is the annual average yield of rice productivity. This variable captures the rice productivity of farmers in kilogram per hectare. I used the average yield of rice productivity provided by the Food and Agriculture Organization (FAO) (2017a, 2017b, 2017c) from 1960 to 2010. The data of Thailand and Vietnam ranged from 1970 to 2010, while the rice productivity of the Philippines ranged from 1960 to 2010.

Table 1 presents the descriptive statistics on the average rice yield of Thailand, Vietnam, and the Philippines. Thailand's rice yield is 22,805.44 kilograms per hectare on average, which is the lower than its Vietnamese and Philippine counterparts. Meanwhile, Vietnam's rice yield is 33,407.51 kilograms per hectare on average, which is higher than that of Thailand and the Philippines. Vietnam's rice yield is more than 10,000 kilograms higher than that in Thailand, and the Philippines' rice yield is 24,000 kilograms² per hectare.

Independent variables

The main independent factor is government intervention in the rice market. In order to operationalize and measure the effect of government intervention regarding rice production, the government's decision to subsidize (or tax) the rice sector is employed. When a government subsidizes the rice sector, farmers have more incentive to increase their productivity; however, when it heavily taxes farmers, they are discouraged from increasing their productivity since the more they harvest, the more tax burdens they have to bear. The nominal rate of assistance (NRA) to the rice sector was employed in order to capture the government's decision to subsidize (or tax) this sector (Anderson 2009b). As Laiprakobsup (2014a, 8) explained the NRA,

[i]t measures the extent to which the government sets the domestic producer price above (or below) the border (i.e. export) price (Anderson and Martin 2009).

Table 1. Descriptive statistics of rice yield of Thailand, Vietnam, and the Philippines (Unit: kilograms per hectare).

Countries	Observation	Mean	Standard Deviation	Minimum	Maximum
Thailand	41	22,805.44	4158.091	15,910	30,087
Vietnam	41	33,407.51	11,025.63	17,922	53,416
The Philippines	50	24,365.08	8047.458	12,299	38,008

The positive NRA percentage indicates that the government is likely to transfer revenues to the producers. In other words, the positive percentage implies that the government subsidizes the agricultural commodity sector in year t .

The nominal rate of assistance in terms of rice is divided into government assistance at farm and export levels. The government assistance at the farm level (i.e. input) is aimed to support farmers *via* production inputs while the assistance at the export level (i.e. border) is aimed to support farmers *via* price policy (Anderson and Martin 2009). There are two independent variables, called input and border, and a positive association between the nominal rate of assistance to rice and rice productivity was expected.

Economic conditions have an impact on rice production in that farmers can be encouraged by positive economic conditions to increase their productivity. In other words, consumers' economic conditions affect producers' incentive to increase their productivity. Real income per capita (in US dollars at a constant price) from 1960 to 2010 is used to measure the people's income in Thailand, Vietnam, and the Philippines. Inflation (Consumer Price Index: CPI) is also employed to measure the consumers' income in Southeast Asia (World Bank 2017). A positive association between real income per capita and rice productivity was expected. Meanwhile, the negative association between inflation and rice productivity was expected.

Trade liberalization has an influence on rice production, and trade openness encourages a country's export growth. Farmers are incentivized to increase their productivity when the country's exports grow. I employed the trade openness index, which measures how countries liberalize their international trade each year. This index is a function of the quantity of exports plus import quantity divided by gross domestic product (GDP) (Heston and Summers 2013). The higher the trade openness percentage, the more open the trade. In other words, the country abandons export and import barriers. I used the trade openness index from 1970 to 2010, and a positive association between trade openness and rice productivity was expected.

The government's decision to subsidize other economic sectors can have an effect on rice production. When a government decides to do so, it is likely to extract resources from agricultural sectors by imposing

a high rate of taxes on agriculture. In other words, government subsidizes one sector at the expense of others. Southeast Asian countries have transformed their economy from an agricultural-based one to an industrial-based economy (Haggard 1990), and the government in Southeast Asia has concentrated on structural adjustment and has supported the industrial and manufacturing sectors. In order to support economic adjustment policy, the government has allocated public resources from agriculture to industry and the manufacturing sectors. In other words, the government's allocation of public resources to these areas illustrates the political influence of industry on the government's decision-making in Southeast Asia. Subsidizing industry has a negative impact on farmers in that government imposes more taxes for accruing revenues from them; consequently, farmers are less likely to increase their productivity. In order to operationalize and measure the government's decision to subsidize industry, I used the nominal rate of assistance to industry in Thailand, Vietnam, and the Philippines from 1970 to 2010 (Anderson 2009b), and a negative association between the government's decision to subsidize industry and rice productivity was expected.

In addition, I controlled for the effects of the government's decision to subsidize agriculture and political institutions. The government's decision to subsidize agriculture can have a positive impact on rice farmers, and public resources are likely to be allocated to rice farmers. Political institutions can affect rice production. Scholars have indicated that regime types lead to the allocation of public resources to agriculture (Laiprakobsup 2014a; Olper and Valentino 2013) in that democratic regimes are more likely to allocate resources to producers than their autocratic counterparts. A nominal rate of assistance to agriculture was employed to measure the government's policy on agriculture in Southeast Asia from 1960 to 2010 (Anderson 2009b), and in order to measure political institutions in Southeast Asia, I used the polity's political institution index, which captures the democratic quality of political institutions in each year (the Polity IV 2017). The index ranges from the most totalitarian political institution (-10) to the most liberal democratic institutions (10).

A quantitative analysis as employed in order to examine the relation between the government's policy and rice production in Southeast Asia. Descriptive

statistics on the independent variables were employed in order to illustrate general information on the data used in this paper, and I used the ordinary least squares (OLS) method to examine the effect of government decisions on rice production. Since we are examining the policies of four Southeast Asian countries from 1960 to 2010, the data were structured using a time-series cross-section (TSCS) method. The fixed-effects method was employed in order to control for the factors specific to each country. It was assumed that each country exhibits some unknown and unobserved factors that affect the level of state intervention in agriculture (Laiprakobsup 2010). The introduction of the fixed-effects method allows for the control for the omitted factors that are not a part of the models. The statistical analysis focuses on explaining the impact of the independent variables within countries, not cross-country variations.

Since the data is categorized as time-series cross-section, variables of interest can be plagued by non-stationary problem or unit root. Therefore, I used Im, Pesaran, and Shin test for unit root (i.e. non-stationary) (2003) since it was suitable for unbalanced panel data. The test used augmented Dickey-Fuller t-statistics for testing whether the variables are non-stationary. If the coefficients were statistically significant, it was strongly confident that the variables did not contain any unit root. In other words, they were stationary. According to the Im-Pesaran-Shin test, the ADF coefficients for the dependent variable (Yield) were statistically significant at $p < .10$.³ Meanwhile, the nominal rate of assistance to rice sector (Input), inflation, and the nominal rate of assistance to agricultural sector variables were statistically significant at $p < .05$.⁴ The inflation was statistically significant at $p < .05$. In case of the nominal rate of assistance to rice sector (border) and political institution variables, the Im-Pesaran-Shin was unable to test the unit root. Therefore, I used Fisher-Type unit root test (Choi 2001) for the nominal rate of assistance for the rice sector (Border), the nominal rate of assistance to industry, and political institution variables. The coefficients were statistically significant at $p < .05$.⁵ Nonetheless, according to the Fisher-type test, per capita and trade openness are non-stationary. Therefore, I decided to

Table 2. Descriptive statistics.

Variables	Observation	Mean	Standard Deviation	Minimum	Maximum
Nominal Rate of Assistance to Rice Sector (Input)	110	-0.016	0.261	-0.528	0.728
Nominal Rate of Assistance to Rice Sector (Border)	110	-0.001	0.010	-0.038	0.728
Polity	116	0.836	6.801	-9	9
Per Capita	114	1733.846	1094.924	389.42	5075.302
Inflation	115	19.590	62.126	-4.995	411.04
Trade Openness	102	80.982	32.357	36.88	159.68
Nominal Rate of Assistance to Agriculture	111	0.015	0.137	-0.367	0.323
Nominal Rate of Assistance to Industry	116	0.105	0.077	-0.162	0.307

Table 3. Correlation coefficient.

Variables	Yield
Average Yield	1
Nominal Rate of Assistance to Rice sector (Inputs)	0.37***
Nominal Rate of Assistance to Rice (Border)	0.09
Per Capita	-0.04
Inflation	0.04
Trade Openness	0.52***
Nominal Rate of Assistance to Agriculture	0.10
Nominal Rate of Assistance to Industry	-0.38***
Political Institution	-0.20**

* $p < .10$.

** $p < .05$.

*** $p < .01$.

difference and lag the variables in order to solve the problem of non-stationary. Table 2 presents the descriptive statistics for the independent and control variables.

Table 3 presents Pearson's correlation statistics for the dependent and independent variables. The average yield was positively correlated with input (i.e. nominal rate of assistance to rice sector at the farm level), and the coefficient was statistically significant at $p < .01$. Otherwise, the average yield did not have a significant correlation with the nominal rate of assistance to rice sector at the export level. The average yield was positively correlated with trade openness and the coefficient is statistically significant at $p < .01$. Meanwhile, the average yield was negatively correlated with the nominal rate of assistance to industry and the coefficient as statistically significant at $p < .01$. Since the income per capita was highly correlated with trade openness, it could have caused a multicollinearity problem and therefore I did not include this variable or trade openness in the same model.

V. Results

Table 4 presents the statistical results for all models. Model 1 includes only the independent variables of interest (i.e. nominal rate of assistance for rice (inputs) and nominal rate of assistance for rice sector (borders)). Models 2–8 included other independent variables in order to check whether the independent variables of interest were statistically significant once other independent variables were included. In general, the independent variables in every model jointly affected the

Table 4. Statistical results (dependent variable = average rice yield).

Independent Variables/Model	1	2	3	4
Nominal Rate of Assistance to Rice Sector (Inputs)	12,619.3** (2302.32)	7601.20*** (2382.92)	2877.51 (2013.19)	8210.62*** (2384.21)
Nominal Rate of Assistance to Rice Sector (Border)	178,944.6** (70,438.27)	164,425.7** (59,607.41)	162,876.3*** (47,915.27)	169,716.1** (64,855.82)
Per Capita (differenced)		−1.82 (6.13)		4.69 (6.56)
Inflation		−20.59** (8.30)	−25.62*** (7.10)	−29.53*** (8.65)
Trade Openness (differenced)			11.35 (48.62)	
Nominal Rate of Assistance to Agriculture		18,599.93*** (5755.13)	12,829.97*** (4709.71)	
Nominal Rate of Assistance to Industry		−38,782.61*** (8048.797)	−11,479.57 (7322.07)	
Political Institution		242.12** (97.98)	497.96*** (84.87)	350.91*** (101.02)
Constant	27,842.14*** (753.61)	31,619.06*** (1137.56)	29,938.45*** (873.68)	27,714.88*** (822.74)
<i>N</i>	110	108	99	108
<i>F</i>	19.17***	15.70***	21.26***	14.19***
<i>R</i> ²	0.11	0.15	0.05	0.02
Independent Variables/Model	5	6	7	8
Nominal Rate of Assistance to Rice Sector (Inputs)	5044.20** (2070.04)	7137.86*** (2417.73)	7524.49*** (2461.01)	
Nominal Rate of Assistance to Rice Sector (Border Price)	189,529.4*** (54,066.75)	165,131.1*** (60,574.72)		162,206.9** (62,304.16)
Per Capita (differenced)			−0.79 (6.32)	−1.71 (6.40)
Inflation			−20.83** (8.57)	−18.41 (8.65)
Trade Openness	−46.02 (52.67)			
Nominal Rate of Assistance to Agriculture		22,350.42*** (5306.40)	20,719.43*** (5890.92)	24,966.33*** (5642.58)
Nominal Rate of Assistance to Industry		−41,338.89*** (7805.16)	−38,703.98*** (8313.07)	−38,694.11*** (8413.46)
Political Institution	513.71*** (85.74)	247.63** (99.67)	240.85** (101.20)	393.43*** (89.62)
Constant	28,810.88*** (620.48)	31,322.33*** (1042.99)	30,295.02*** (1065.20)	31146*** (1178.96)
<i>N</i>	99	109	108	108
<i>F</i>	21.85***	19.97***	15.98***	15.21***
<i>R</i> ²	0.03	0.17	0.17	0.07

* $p < .10$.** $p < .05$.*** $p < .01$.

dependent variable since the F-statistics were significant at $p < .01$. Due to the adjusted R^2 , models 1–8 could predict changes in the average rice yield at approximately 1–17 percent.

The results indicated that the nominal rate of assistance to the rice sector, which helps rice farmers' production inputs, positively affected the average rice yield, and the variable was statistically significant at $p < .05$.

- A one unit increase in the nominal rate of assistance for rice production input was associated with an increase of 12,619.3 kilograms per hectare in rice yield. (Model 1)
- A one increase in the nominal rate of assistance for rice production input was associated with an increase of 7,601.20 kilograms per hectare in rice yield. (Model 2)
- A one unit increase in the nominal rate of assistance for rice production input was associated with an increase of 8210.62 kilograms per hectare in rice yield. (Model 4)
- A one unit increase in the nominal rate of assistance for rice production input was associated with an increase of 5,044.20 kilograms per hectare in rice yield. (Model 5)
- A one unit increase in the nominal rate of assistance for rice production input was associated with an increase of 7,137.86 kilograms per hectare in rice yield. (Model 6)

- one unit increase in the nominal rate of assistance for rice production input was associated with an increase of 7,524.49 kilograms per hectare in rice yield. (Model 7)

The results indicated that the nominal rate of assistance to the rice sector, which supports rice farmers' export prices, positively affected the average rice yield, and the variable was statistically significant at $p < .05$.

- A one unit increase in the nominal rate of assistance for rice export price was associated with an increase of 178,444.6 kilograms per hectare in rice yield. (Model 1)
- A one increase in the nominal rate of assistance for rice export price was associated with an increase of 164,425.7 kilograms per hectare in rice yield. (Model 2)
- A one unit increase in the nominal rate of assistance for rice export price was associated with an increase of 162,876.3 kilograms per hectare in rice yield. (Model 3)
- A one increase in the nominal rate of assistance for rice export price was associated with an increase of 169,716.1 kilograms per hectare in rice yield. (Model 4)
- A one unit increase in the nominal rate of assistance for rice export price was associated with an increase of 189,529.4 kilograms per hectare in rice yield. (Model 5)

- A one increase in the nominal rate of assistance for rice export price was associated with an increase of 165,131. kilograms per hectare in rice yield. (Model 6)
- A one unit increase in the nominal rate of assistance for rice export price was associated with an increase of 162,206.9 kilograms per hectare in rice yield. (Model 7)

To illustrate how the nominal rate of assistance for the rice sector has an influence on rice productivity in Southeast Asia, I employed marginal effects. Briefly, the marginal effects model predicts how the nominal rate of assistance for rice sector affects average the rice yield given the different levels of nominal rate of assistance for rice sector, and whether the effect is statistically significant.

Table 5 presents the statistical results of the marginal effects model. The coefficients are the predicted average rice yield given the different levels of nominal rate of assistance for rice production inputs. As the results show, the higher the level of nominal rate of assistance for rice production inputs, the more likely was the average rice yield of Thailand, Vietnam, and the Philippines to increase. When the nominal rate of assistance was at -9 percent, predicted rice yield was - 59,353 kilograms per hectare. On the other hand, when the nominal rate of assistance was at 9 percent, the predicted rice yield was 103,677 kilograms per hectare. When the government imposed tax barriers on rice production input, the average rice yield was in decline; however, when

Table 5. Marginal effects of the nominal rate of assistance (NRA) for rice production on rice production.

Nominal Rate of Assistance	Coefficients	Lower Bound	Upper Bound
-10	-59,353** (23543.68)	-98079	-20,627.72
-9	-50,773** (21185)	-85,620.14	-15,925.37
-8	-42,192.49** (18828.21)	-73,162.14	-11,222.83
-7	-33,611.91** (16470.7)	-60,703.8	-6520.028
-6	-25,031.34* (14113.42)	-48,245.85	-1816.826
-5	-16,450.77 (11756.54)	-35,788.55	2887.015
-4	-78,70.19 (9400.33)	-23,332.36	7591.975
-3	710.38 (7045.49)	-10,878.41	12,299.18
-2	9290.96** (4694.06)	1569.92	17,012
-1	17,871.53*** (2356.29)	13,995.78	21,747.28
0	26,452.1*** (438.90)	25,730.18	27,174.03
1	35,032.68*** (2440.45)	31,018.5	39,046.86
2	43,613.25*** (4779.28)	35,752.03	51,474.47
3	52,193.83*** (7130.91)	40,464.52	63,923.14
4	60,774.4*** (9485.83)	45,171.6	76,377.2
5	69,354.97*** (11842.07)	49,876.51	88,833.44
6	77,935.55** (14198.97)	54,580.32	101,290.8
7	86,516.12*** (16556.26)	59,283.5	113,748.7
8	95,096.7*** (18913.78)	63,986.3	126,207.1
9	103,677.3*** (21271.46)	68,688.83	138,665.7
10	112,257.8*** (23629.26)	73,391.17	151,124.5

Note: Numbers in parentheses are standard errors.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

the government began to allocate resources to rice production, rice productivity gradually increased. However, it was noticed that the coefficients for the nominal rate of assistance to rice production inputs at -5 to -3 percent were not statistically significant. This is probably because the government did not clearly formulate agricultural policy. On the one hand, it still imposes tax barriers on rice producers, and it has tended to shift policy toward liberalization and assistance.

Inflation has a significant effect on rice productivity in Southeast Asia, and the results indicated that the high level of inflation led to a decrease in rice productivity in Thailand, Vietnam, and the Philippines. The coefficient of inflation variable was statistically significant at $p < .05$ in every model the inflation variable was included.

- A one unit increase in the inflation rate was associated with a 20.59 kilogram per hectare decrease of average rice yield. (Model 2)
- A one unit increase in the inflation rate was associated with a 25.62 kilogram per hectare decrease of average rice yield. (Model 3)
- A one unit increase in the inflation rate was associated with a 29.53 kilogram per hectare decrease of average rice yield. (Model 4)
- A one unit increase in the inflation rate was associated with a 20.83 kilogram per hectare decrease in average rice yield. (Model 7)
- A one unit increase in the inflation rate was associated with a 22.08 kilogram per hectare decrease in the average rice yield. (Model 8)

Similar to examining the effect of government policy, I employed marginal effects in order to examine the extent to which inflation affected rice productivity at different levels of inflation. Table 6 presents the statistical results of the marginal effects model. As expected, a high level of inflation was associated with a decrease in rice productivity. For instance, when inflation was at 1 percent (i.e. normal economic condition), the predicted average rice yield was 26,794 kilograms per hectare. However, when inflation was at 10 percent (i.e. hyperinflation), the predicted average rice yield was 26,560 kilograms per hectare. Hence, the higher the level of inflation, the more likely was the average rice yield to decrease.

The government's assistance to industry was seen to have a negative impact on rice productivity. The nominal rate of assistance for the industry variable negatively affected the average rice yield. The variable was statistically significant at $p < .10$. Resource allocation to the industry led to a decrease in rice productivity, and the results indicated that resource allocation to the

Table 6. Marginal effects of inflation on rice production.

Inflation	Coefficients	Lower Bound	Upper Bound
-10	27,078.88*** (504.61)	26248.88	27,908.89
-9	27,052.96*** (500.47)	6,229.76	27,876.16
-8	27,027.03*** (496.44)	26,210.46	27,843.6
-7	27,001.11*** (492.52)	26,190.99	27,811.23
-6	26,975.18*** (488.71)	26,171.33	27,779.03
-5	26,949.26*** (485.01)	26,151.49	27,747.03
-4	26,923.33*** (481.43)	26,131.45	27,715.21
-3	26,897.41*** (477.98)	26,111.21	27,683.6
-2	26,871.48*** (474.63)	26,090.78	27,652.18
-1	26,845.56*** (471.42)	26,070.13	27,620.98
0	26,819.63*** (468.34)	26,049.28	27,589.98
1	26,793.7*** (465.38)	26,028.22	27,559.19
2	26,767.78*** (462.56)	26,006.93	27,528.63
3	26,741.85*** (459.88)	25,985.42	27,498.28
4	26,715.93*** (457.33)	25,963.69	27,468.16
5	26,690*** (454.92)	25,941.73	27,438.28
6	26,664.08*** (452.65)	25,919.53	27,408.62
7	26,638.15*** (450.53)	25,897.1	27,379.2
8	26,612.23*** (448.55)	25,874.42	27,350.03
9	26,586.3*** (446.72)	25,851.51	27,321.09
10	26,560.37*** (445.04)	25,828.34	27,292.41

Note: Numbers in parentheses are standard errors.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

industry negatively affected the rice farmers and their incentive to improve their productivity.

- A one unit increase in the nominal rate of assistance for industry was associated with a 38,782.61 kilogram per hectare decrease in the average rice yield. (Model 2)
- A one unit increase in the nominal rate of assistance for industry was associated with a 41,338.89 kilogram per hectare decrease in the average rice yield. (Model 6)
- A one unit increase in the nominal rate of assistance for industry was associated with a 38,703.98 kilogram per hectare decrease in the average rice yield. (Model 7)
- A one unit increase in the nominal rate of assistance for industry was associated with a 38,694.11 kilogram per hectare decrease in the average rice yield. (Model 8)

Political institutions traditionally have a positive effect on rice productivity and the variable for the present study was statistically significant at $p < .05$.

- A one unit increase in the level of democratic development was associated with a 242.12 kilogram per hectare increase in the average rice yield. (Model 2)
- A one unit increase in the level of democratic development was associated with a 497.96 kilogram per hectare increase in the average rice yield. (Model 3)
- A one unit increase in the level of democratic development was associated with a 350.91 kilogram per hectare increase in the average rice yield. (Model 4)
- A one increase in the level of democratic development was associated with a 513.71 kilogram per hectare increase in the average rice yield. (Model 5)

- A one unit increase in the level of democratic development was associated with a 247.63 kilogram per hectare increase in the average rice yield. (Model 6)
- A one unit increase in the level of democratic development was associated with a 240.85 kilogram per hectare increase in the average rice yield. (Model 7)
- A one unit increase in the level of democratic development was associated with a 393.43 kilogram per hectare increase in the average rice yield. (Model 8)

The marginal effects model was employed to examine the effect of political institutions on rice productivity in Thailand, Vietnam, and the Philippines. Table 7 indicates that democratic institutions contributed to an increase in rice productivity, and the marginal effects coefficients were statistically significant at $P < .01$. When political institutions were categorized as autocratic (-10), the predicted rice yield was 24,235.66 kilograms per hectare. However, when political institutions were categorized as liberal (10), the predicted rice yield was 27,942.26 kilograms per hectare. The higher the level of liberal democratic development, the more likely was rice productivity to increase. Liberal institutions are more likely to encourage the growth of rice productivity.

The government's policy on a whole agricultural sector did have a positive impact on rice productivity. Results show that the nominal rate of assistance to agriculture is positively associated with an increase of rice productivity. The variable is statistically significant at

Table 7. Marginal effects of political institution on rice production.

Level of Liberal Democratic Development	Coefficients	Lower Bound	Upper Bound
-10	24,235.66*** (1180.11)	22,294.56	26,176.77
-9	24,420.99*** (1089.13)	22,629.54	26,212.45
-8	24,606.32*** (999.59)	22,962.14	26,250.51
-7	24,791.65*** (911.93)	23,291.66	26,291.64
-6	24,976.98*** (826.73)	23,617.13	26,336.84
-5	25,162.31*** (744.85)	23,937.15	26,387.48
-4	25,347.64*** (667.50)	24,249.71	26,445.57
-3	25,532.97*** (596.44)	24,551.91	26,514.03
-2	25,718.3*** (534.21)	24,839.6	26,597
-1	25,903.63*** (484.21)	25,107.18	26,700.08
0	26,088.96*** (450.53)	25,347.9	26,830.02
1	26,274.29*** (436.97)	25,555.55	26,993.03
2	26,459.62*** (445.36)	25,727.08	27,192.16
3	26,644.95*** (474.54)	25,864.41	27,425.49
4	26,830.28*** (521.03)	25,973.27	27,687.29
5	27,015.61*** (580.69)	26,060.47	27,970.75
6	27,200.94*** (649.90)	26,131.96	28,269.92
7	27,386.27*** (725.93)	26,192.22	28,580.32
8	27,571.6*** (806.86)	26,244.43	28,898.77
9	27,756.93*** (891.36)	26,290.78	29,223.08
10	27,942.26*** (978.50)	26,332.78	29,551.74

Note: Numbers in parentheses are standard errors.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

$p < .05$. This means that government's policy did have an impact on rice farmers' productivity. Meanwhile, the per capita and trade openness variables did not have a significant effect on rice productivity.

VI. Discussion and conclusion

The reduction of tax barriers in production inputs has a positive effect on farmers' rice productivity, and the results showed that the government's tax intervention in rice production discourages the growth of rice productivity in Southeast Asia. Rice productivity in Thailand and the Philippines has gradually increased since the 1980s, when the governments in both countries decided to reduce tax barriers and restriction programs on production inputs. Vietnam is the best example of the association between the reduction of tax and trade barriers and the growth of rice productivity. In the 1970s, the communist government strictly controlled rice production through a collectivist policy, and the government strictly controlled the rice market at every level. Therefore, rice productivity decreased at the end of the 1970s (see [Figure 1](#)). However, Vietnam's rice productivity exponentially increased in the 1980s when the government decided to initiate land reform and employ less intervention in rice production, and the Vietnamese government has gradually liberalized rice production in that it has encouraged foreign investment in rice production and rice exports (Gavagnin, Zolin, and Pastore 2016). The reduction of price controls on production inputs such as fertilizers and machines has also contributed to the growth of rice production in that rice farmers now have an incentive to improve their productivity. Moreover, government investment on rice production becomes one of the key factors leading to the increase of rice productivity. The Laos government has invested in developing direct rice seed planting in the central part of the country which leads to increase of rice productivity (Xangsayasane 2018). Meanwhile, the Cambodian government has invested in developing newly rice fragrant called Phka Rumduol, Phka Romeat and Phka Rumdeng which won the World's Best Rice for several years (Ponleu and Sola 2018).

The effect of the government's policy on rice production must be considered within economic and political contexts. Economic downturns have a negative impact on rice production, and the statistical results here illustrated that a high level of inflation leads to a decline in rice productivity in Southeast Asia. The fall of rice productivity in Thailand and in the Philippines in 1997 and 2008 illustrates a significant association between an economic downturn (i.e. Asian Economic Crisis in 1997 and American Economic Crisis in 2008) and the decrease of rice productivity (see

[Figure 1](#)). When an economy is in decline so that it negatively affects consumers' everyday life, the government is more likely to control commodity prices, especially major food prices, at the expense of farmers. Controlling price discourages farmers from production since the more they produce, the more likely they are to be controlled.

Political factors also lead to the growth or decline of rice productivity in Southeast Asia. Democratic institutions lead to the growth of rice productivity, and political liberalization can encourage the growth of rice production in terms of shifting agricultural policymaking. Elected governments are more likely to appeal to rice farmers in order to mobilize political popularity from them. Therefore, governments tend to implement production assistance programs such as providing fertilizers or milling machines in order to appeal to farmers for their votes. In other words, liberal political institutions encourage farmers to pressure the government to implement policy in favor of their interests. Even though Vietnam has been classified as an autocratic system, the political leadership there has been more liberal than that in the 1970s and 1980s, and its rice policy direction is more liberal than in previous decades.

However, interest group politics leads to a decline in rice production, and the influence of industry and manufacturing interests can negatively affect rice farmers' interests. Further, such interests can be used to lobby and pressure the government to transfer the government's resources to their sectors again at the expense of rice farmers. During the 1960s and 1970s, several governments in Southeast Asia used import-substitution industrialization (ISI) for their development strategy, which heavily subsidized domestic industries and imposed barriers on international trade and investment. These trade barriers resulted in the high prices of imported agricultural inputs, which discouraged producers from improving their productivity. More important, these trade barriers impeded technological diffusion regarding agricultural production. As a result, agricultural productivity did not grow much, even though the governments invested in agricultural production. By the 1980s, Southeast Asian countries abandoned several ISI policies regarding trade barriers in order to pursue market reform and to bring about foreign investment. The pursuit of market reform and trade liberalization had positive effects on farmers in that they were able to purchase production inputs at market prices, not distorted ones, and production knowledge was able to be transferred to farmers. Vietnam's agricultural trade policy is an example of the positive association between trade liberalization and the growth of rice production. One of the leaders of the Thai Rice Mill Association pointed out that

because the Vietnamese government invited foreign investors to import highly-sophisticated milling machines without imposing tax barriers on the investors, Vietnam was able to take a lead over Thailand in terms of rice productivity: 'Their government (the Vietnamese government) invite Swiss investors to establish rice milling houses in Vietnam. Their milling machines are much more technologically advanced than what we have now.'⁶ Therefore, as can be seen, the influence of interest groups on the policymaking process has an influence on rice productivity.

The abandonment of trade barriers and agricultural taxation illustrates the influence of trade liberalization policy. Trade openness can lead to the growth of rice productivity, and the abandonment of export barriers can contribute to export growth. The growth of commodity demands in the international market can encourage rice farmers to increase their productivity. The reduction of rice export tax barriers in Thailand and Vietnam in the 1990s led to the growth of rice exports in those countries. Thailand and Vietnam have become the major rice exporters in the world market. Recently, other Southeast Asian countries have abandoned trade barriers in order to invite foreign investment in rice production. The Cambodian government has reduced import taxes in order to invite foreign investors to bring rice processing mechanization which contributes to gradual increase in Cambodia's rice production and exports (Ponleu and Sola 2018).

Due to a lack of data, this article does not consider some factors that can affect rice production in Southeast Asia. Labor⁷ is one of the most important factors which affects farmers' rice production. The majority of rice farmers in several Southeast Asian countries is elderly and over 50 years of age. For instance, having conducted a survey research on Thai rice farmers' satisfaction on the government's policy, Laiprakobsup (2017) found that the average ages of farmer respondents were 53. Since several governments in Southeast Asia have structurally adjusted their economy to achieve industrialization, young labor in rural areas have migrated to cities for finding jobs in industrial and service sectors (Fox et al. 2018). As a result, only elderly labor is supplied in rural areas, especially rice cultivated areas. Shortage of young labor supply can affect rice production. Although mechanization for rice production and harvest has been available, it can increase farmers' production costs. Some poor farmers cannot afford to such mechanization. Government's technological and knowledge support can overcome problems of shortage of labor supply and difficulty to production technology. In the future, the effect of labor factor on rice production should be analyzed.

To conclude, government assistance policy and trade liberalization have become policies that contribute to productivity growth in Southeast Asia. Productivity growth is associated with a government's agricultural policy shift in support of agricultural production and the liberalization of trade. Such agricultural policy shifts and trade liberalization have occurred within the political transitions to liberal institutions and policymaking. In Thailand and the Philippines, politics have transitioned to electoral politics where elected politicians have become the major players in policymaking. Meanwhile, a new generation of political leadership, one that is pursuing market reform, has consistently played a key role in policymaking in Vietnam. Therefore, the growth of agricultural production can be sustained through a government's policy of encouragement, economic growth, and political liberalization.

Notes

1. Focus group with farmers from Cabatuan district, Iloilo province on 26 May 2018.
2. The average rice yield from 1970 to 2010 is 26,000 kilograms per hectare.
3. The ADF coefficient is 1.44 and the p -value is 0.07.
4. The ADF coefficients for input, border, and polity variables are -2.66 , -4.53 , and -3.90 respectively.
5. The modified inverse chi squares statistics are 2.05, 1.82, and 1.73 respectively.
6. Interview with one of the leaders of the Thai Rice Mill Association, 20 October 2017.
7. I thank an anonymous reviewer for suggesting this point.

Acknowledgement

I thank the editor and two anonymous reviewers for their insightful comments. I thank Bruce Leeds for his constructive comments. I thank the Faculty of Political Science, the Center for Social Development Study (CSDS), Contemporary Peasant Study research unit, and the Chulalongkorn Social Research Institute (CUSRI) for their administrative support. I thank Kan Sangtong, Tanapon Nithipruethi, Nattapat Sopin, and Ratchamongkol Mongkoldao for their superb research assistance. All remaining errors are mine.

Disclosure statement

No potential conflict of interest was reported by the author.

Funding

This project is financially supported by the Thailand Research Fund (TRF) [grant number SRI5910108].

References

- Anderson, K. ed. 2009a. *Distortion to Agricultural Incentives: A Global Perspective, 1955-2007*. Washington, DC: Palgrave Macmillan and The World Bank.
- Anderson, K. 2009b. "Five Decades of Distortions to Agricultural Incentives." In *Distortions to Agricultural Incentives: A Global Perspective, 1955-2007*, edited by K. Anderson, 3–64. Washington, DC: Palgrave Macmillan and The World Bank.
- Anderson, K., and W. Martin. eds. 2009. *Distortions to Agricultural Incentives in Asia*. Washington, DC: The International Bank for Reconstruction and Development/The World Bank.
- Bates, R. H. 1981. *Markets and States in Tropical Africa: The Political Basis of Agricultural Policies*. Berkeley: University of California Press.
- Bello, W. 2009. *The Food Wars*. New York: Verso.
- Choi, I. 2001. "Unit Root Tests for Panel Data." *Journal of International Money and Finance* 20: 249–272.
- FAO. 2017a. "Crops: Thailand." <http://www.fao.org/faostat/en/#data/QC>.
- FAO. 2017b. "Crops: The Philippines." <http://www.fao.org/faostat/en/#data/QC>.
- FAO. 2017c. "Crops: Vietnam." <http://www.fao.org/faostat/en/#data/QC>.
- Fox, J., T. Nghiem, K. Ham, K. Hurni, and I. G. Baird. 2018. "Large-Scale Land Concessions, Migration, and Land Use: The Paradox of Industrial Estates in the Red River Delta of Vietnam and Rubber Plantations of Northeast Cambodia." *Land* 7 (2): 1–17.
- Gavagnin, C., M. B. Zolin, and A. Pastore. 2016. "Vietnam's Rice Price at the Intersection of Globalisation and Climate Variability." *The Copenhagen Journal of Asian Studies* 34 (2): 28–53.
- Giesecke, J., N. H. Tran, E. Corong, and S. Jaffee. 2013. "Rice Land Designation Policy in Vietnam and the Implications of Policy Reform for Food Security and Economic Welfare." *The Journal of Development Studies* 49 (9): 1202–1218.
- Haggard, S. 1990. *Pathways From the Periphery: The Politics of Growth in the Newly Industrializing Countries*. Ithaca, NY: Cornell University Press.
- Haggard, S., and R. Kaufman. 1995. *The Political Economy of Democratic Transition*. Princeton, NJ: Princeton University Press.
- Harun, R., and E. E. E. Ariff. 2017. "The Role of Institutional Support in Malaysia's Paddy and Rice Industry." http://ap.ffc.agnet.org/ap_db.php?id=737.
- Haughton, J., L. T. Duc, N. N. Binh, and J. Fetzer. 2004. "The Effect of Rice Policy on Food Self-Sufficiency and on Income Distribution in Vietnam." https://www.iatp.org/files/258_2_70033.pdf.
- Heston, A., and R. Summers. 2013. "Penn World Table (version 6.3)." [Data file]. http://pwt.econ.upenn.edu/php_site/pwt63/pwt63_form.php.
- Im, K. S., M. H. Pesaran, and Y. Shin. 2003. "Testing for Unit Root in Heterogeneous Panels." *Journal of Econometrics* 115 (1): 53–74.
- Kasara, K. 2007. "Tax Me If You Can: Ethnic Geography, Democracy, and the Taxation of Agriculture in Africa." *American Political Science Review* 101 (1): 159–172.
- Laiprakobsup, T. 2010. "Political Regime, Business Coordination, Unity of Rural Farmers, and Agricultural Politics in Developing Countries: A Case Study of Thailand." Doctoral diss., the University of Houston, Texas.
- Laiprakobsup, T. 2013. "Tax Abandonment, Political Regime Type and Rice Export Growth in Thailand." *International Journal of Civic, Political, and Community Studies* 10 (3): 39–50.
- Laiprakobsup, T. 2014a. "Political Liberalization and Agricultural Trade Policy in Indonesia and the Philippines." *Asian Journal of Political Science* 22 (1): 1–19.
- Laiprakobsup, T. 2014b. "Populism and Agricultural Trade in Developing Countries: A Case Study of Thailand's Rice-Pledging Scheme." *International Review of Public Administration* 19 (4): 380–394.
- Laiprakobsup, T. 2017. "Inequality in Rice Farmers' Access to a Government Assistance Program in Rural Thailand." *Asian Politics & Policy* 9 (3): 442–461.
- Lawas, J. M., and G. E. Korzan. 1971. "Rice Policy in the Philippines." In *Viewpoints on Rice Policy in Asia*, edited by R. Barker (no page number). Washington, DC: The International Rice Research Institute.
- Marsh, S. P., and T. G. MacAulay. 2006. *Land Reform and the Development of Commercial Agriculture in Vietnam: Policy and Issues*. Sydney: Department of Agricultural Economics, the University of Sydney.
- Najim, M. M. M., T. S. Lee, M. A. Haque, and M. Esham. 2007. "Sustainability of Rice Production: A Malaysian Perspective." <https://jas.sljol.info/articles/10.4038/jas.v3i1.8138/galley/download/>.
- OECD. 2015. *Agricultural Policies in Viet Nam*. Paris: OECD.
- Olper, A., and R. Valentino. 2013. "Electoral Rules, Form of Government and Redistributive Policy: Evidence from Agriculture and Food Policies." *Journal of Comparative Economics* 41: 141–158.
- Panichvejsunti, T., J. K. M. Kuwornu, G. P. Shivakoti, C. Grünbühel, and P. Soni. 2018. "Smallholder Farmers' Crop Combinations Under Different Land Tenure Systems in Thailand: The Role of Flood and Government Policy." *Land Use Policy* 72: 129–137.
- Phongpaichit, P., and C. Baker. 2002. *Thailand: Economy and Politics*. 2nd ed. New York: Oxford University Press.
- Ponleu, C., and H. Sola. 2018. "Overview of the Cambodian Rice Market: Challenge and the Way Forward." http://ap.ffc.agnet.org/ap_db.php?id=886.
- Siamwalla, A., and S. Setboonsarng. 1991. "Thailand." In *The Political Economy of Agricultural Pricing Policy: Volume 2, Asia*, edited by A. O. Krueger, M. Schiff, and A. Valdes, 2nd ed., 236–280. Baltimore, MD: The World Bank and The John Hopkins University.
- Vargas, A. 2003. *The Philippines Country in Brief: Property Rights and Land Markets*. Washington, DC: US Agency for International Development.
- Warr, P. G., and A. Kohpaiboon. 2009. "Thailand." In *Distortions to Agricultural Incentives in Asia*, edited by K. Anderson, and W. Martin, 255–280. Washington, DC: The International Bank for Reconstruction and Development/The World Bank.
- Welsch, D., and S. Tongpan. 1971. "Rice in Thailand." In *Viewpoints on Rice Policy in Asia* (no page number), edited by R. Barker. Washington, DC: The International Rice Research Institute.
- World Bank. 2017. "Consumer Price Index." <https://data.worldbank.org/indicator/FP.CPI.TOTL>.
- Xangsayasane, P. 2018. "Rice Breeding and Mechanization for Value Addition in Laos PDR." http://ap.ffc.agnet.org/ap_db.php?id=889.