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ACREAGE RESPONSE OF RICE: A CASE STUDY IN MALAYSIA

by

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Abstract

This paper serves as preliminary study to investigate the relative impacts of various factors on acreage response of rice in Malaysia. The findings provide mixed signals which are different from other rice production countries. Hence, future studies are deemed essential to probe the issues with justifications by looking at the connection of Malaysian paddy production and economic theory, as well as implications to policymakers.

Keywords: *Acreage response, rice, paddy*

JEL code: Q11

1.0 Introduction

Malaysia has largely identified the need to increase her paddy production and hereafter rice production to feed her growing population. The need was addressed in the Third National Agricultural Policy (1998-2010) where eight granary areas were designated as permanent paddy producing areas to realise a minimum self-sufficiency level (SSL) for rice of 65 per cent. It was further emphasized in the Eighth Malaysian Plan (2001-2005) and the Ninth Malaysian Plan (2006-2010) to achieve rice SSL of 72 per cent and 90 per cent by 2005 and 2010 respectively.

To boost rice production or supply response, it can be done in short/medium term by expanding acreage of planted area or in long term by increasing yield or improving efficiency of conversion from paddy to rice. Due to the urgency, the ideal immediate deed is to expand acreage of paddy planted area in Malaysia. Under such circumstance, farmers in other countries may have to worry about production costs but not in Malaysia. The Malaysian government has devoted splendid funding (incentives/subsidies) to encourage expansion of paddy plantation and production

Instead of all the initiatives by the government, statistics and trend of paddy planted area suggest that there is no or minimal acreage response of rice in Malaysia. For example, the paddy planted area was at peak of 766,000 hectares in 1972 but it then decreased significantly to historic low of 645,000 hectares in 2006. While there are more to investigate, this paper serves as preliminary

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study to investigate the relative impacts of various factors on acreage response of rice in Malaysia.

2.0 Model Specification and Data

A simplified acreage response function from Salassi (1995) can be represented by:

$$A = f(P,X) \tag{1}$$

where A *is* the planted acreage of the commodity,
P is the price of the commodity, and
X is a vector of variables representing supply shifters.

This study extended the model similar like those applied in Mythili (2001), Mahmood *et al.* (2007), and Salassi (1995). While Salassi (1995) included government support in the response function, Mahmood *et al.* (2007) empirically showed that paddy planted area is a function of lagged paddy planted area, lagged paddy yield, and lagged paddy price. Considering that Malaysian paddy production is heavily subsidized by the government, the extended model used in this study can be expressed as:

$$PDYAPL_t = \alpha + \beta_1 PDYAPL_{t-1} + \beta_2 PDYPRC_{t-1} + \beta_3 PDYYLD_{t-1} + \beta_4 GOVSPT_t \tag{2}$$

where $PDYAPL_t$ is paddy planted area ('000 hectare),
$PDYAPL_{t-1}$ is lagged paddy planted area ('000 hectare),
$PDYPRC_{t-1}$ is lagged domestic paddy price (RM/ton),
$PDYYLD_{t-1}$ is lagged paddy yield (ton/hectare); and
$GOVSPT_t$ is government support (RM million).

With the specification of Equation (2), the data for the identified variables were collected from IRRI (2008). The whole set of the data was then verified by using stationary tests. This procedure is particularly important to determine which estimation method to be used to estimate the equation. The result of the stationary tests would be presented in next section, followed by the applied estimation method.

3.0 Results

Table 1 presents the result of the stationary tests, using augmented Dickey-Fuller (ADF) test. Most of the computed ADF test-statistics were greater than the critical values (-2.9266 at 5 percent significant level) at level, they suggested that the set of data had unit root problem. However, Durbin-Watson statistics those were smaller than 2 may have autocorrelation problem Hence, ADF test was further conducted and found that there was no unit root problem in the data set at the first difference ($I(1)$).

Table 1: Augmented Dickey-Fuller test statistics of unit roots

Variable	Level	First Difference
PDYAPL	-3.2627	-9.3732
PDYPRC	-0.3519	-6.6094
PDYYLD	-0.8938	-6.4537
GOVSPT	-0.8980	-6.9758
Critical value [a]	-2.9266	-2.9281

Note: [a] 95 percent confidence level.

Subsequently, Equation (2) extended with first order autoregressive error specification and was estimated via linear Ordinary Least Squares (OLS) in log-log form. The simplicity of log-log form would provide elasticity estimates in the equation directly, as presented in Table 2. It was found that all the variables were statistically significant. Lagged paddy planted area and government support were found to have positive relationship with paddy planted area while negative sign in lagged domestic paddy price and lagged paddy yield suggests that there is negative relationship between the two variables and paddy planted area.

Table 2: Estimates of the acreage response of rice in Malaysia

Variable	Coefficient	t-Statistic
Intercept	1.2741	(2.9833)***
$\log(PDYAPL_{t-1})$	0.5223	(6.4813)***
$\log(PDYPRC_{t-1})$	-0.3036	(-6.5923)***
$\log(PDYYLD_{t-1})$	-0.2449	(-3.1023)***
$\log(GOVSPT_t)$	0.2891	(6.6393)***
AR(1)	-0.3526	(-2.0764)**
R-squared	0.8276	

Note: Statistically significant *** at 1 percent level and ** at 5 percent level

4.0 Conclusions

While this paper serves as preliminary study to investigate the relative impacts of various factors on acreage response of rice in Malaysia, the findings provide mixed signals which are different from other rice production countries. Hence, future studies are deemed essential to probe the issues with justifications by looking at the connection of Malaysian paddy production and economic theory, as well as implications to policymakers.

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