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Conference Paper

An Association between Pledging Policies and the Financial Performance of Cassava

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Abstract

This paper involves a study to investigate the association between pledging policies by the government and financial performance of cassava product manufacturers in Thailand. A polynomial regression model is constructed to describe a key financial performance measure using a set of control variables and pledging policy variables. The control variables are obtained from financial statements of 58 starch manufacturers and 8 ethanol manufacturers that solely use fresh cassava roots as raw material during 2009-2014. Result from the model suggests an appropriate agricultural policy for the cassava product industry in Thailand.

Keywords: Cassava; Control Variables; Financial Performance; Pledging Policies, Polynomial Regression

INTRODUCTION

Cassava is one of the most important economic crops of Thailand. Thailand is the World's largest cassava products exporter, having an export value of $2,490 million in 2013, followed by Vietnam ($518.12 million) [8]. China is the World's biggest cassava importer ($2,677 million) [8]. Major demand of cassava chips is driven by China, which uses cassava for ethanol, liquor, citric acid, and feed productions. Since 2002, ethanol and liquor consumption in China resulted in a rise in demand for cassava chips, which increased the cassava chip production to 27 million tons in 2009 [5]. China uses cassava chips as a substitute product of corn for ethanol production. When corn price decreases, cassava chip price is forced to decrease accordingly, which adversely affects Thai cassava market. Due to the price fluctuation in the global market, in some

harvest years, the government had launched price intervention policies, i.e., pledging program and income guarantee program to help secure cassava farmer's income. According to Parthanadee et al. [12], Thai government had started to intervene the cassava market using pledging policy from 1999/0 0 to 2008/09. The government then switched to price guarantee program in 2010/11 and 2011/12. In 2008/09, the government set the pledging price much higher than the market price leading to an economic loss of approximately 9, 700million baht as of April 2009. According to the Thailand Development Research Institute's (TDRI's) report (2016), Thai cassava farmers receive little benefits from the pledging policy where most benefits went to cassava chip and starch manufacturers, and exporters. Thai government had to bear the burden from the damage caused by the pledging policy.

Another important negative consequences from the pledging policy are corruptions among stakeholders (i.e., cassava farmers, manufacturers, and government officials. Moreover, farmers also harvested cassava roots earlier than usual to pledge to the government which affected the price and quality of the roots. Nevertheless, the Thai government set the pledging policy again in 2011/12 and 2012/13 [3]. The average pledging prices of fresh cassava roots were 2.825 baht/kg in 2012 and 2.675 baht/kg in 2013 [6, 7].

Laiprakobsup [11] suggested that the Thai government should not intervene the agricultural market via pledging policy (which was implemented as a type of populist policy) but should promote a market oriented policy instead. Poramacom et al. [15] stated that Thai cassava farmers preferred the price guarantee policy over the pledging program. Nonetheless, most research studies focus on the benefits received at the farmer stage.

This paper aims to investigate whether the government intervention policy, specifically, the pledging policy has a relationship with the cassava product manufacturers' financial performance. Financial performance data of starch and ethanol manufacturers during the years when pledging programs were in effect, and the list of cassava product manufacturers who participated in the pledging program were collected. Polynomial regression was employed to investigate the associations between cassava pledging policy and the financial performance of cassava product manufacturers.

LITERATURE REVIEW

Several research studies focused on the impact of the agricultural policy on the benefits of the farmers and on economic impact of the nation as a whole in developing countries. Due to the farmer poverty, government had to intervene to assist farmers in increasing crop price. The papers reviewed will be based on the government intervention policy on agricultural products and the benefits received by the farmers and other related consequences of such policy.

Government intervention policy is intensive in the developing countries. During 2011-2014, Thai government was heavily criticized for its massive public spending of $3.78 billion for the rice pledging policy, which incurred a loss of $16 billion. Despite large spending, the benefit gained was less than expected as the program aimed to improve the net income of the farmers. Rice pledging scheme had damaged the Thai rice-milling business, particularly the rice millers that did not participate in the program, as the government sets the price much higher than the market price. The program was also exposed to corruption at every stage. The government had to keep large stock of rice and sold them at a loss. The program was set up mainly for political purposes, rather than for farmers. Laiprakobsup [11], Permani and Vanzetti [14], and Attavanich [4], suggested that government should instead assist farmers in the long run, such as providing supports in terms of fertilizers, harvesting tools, rice seeds, warehouse and even providing low interest loan for farmers.

From the literature reviews, no research has studied the relationship between the pledging policy and financial performance of cassava product manufacturers. This study aims to fill this research gap. Regarding financial performance, one of the most widely used measures of business performance is return on assets (ROA). ROA measures the efficiency of asset management to generate revenue to the company. Research studies that focused on ROA are such as Pasiouras and Kosmidou [13] in banking industry, Aissa and Goaied [1] in modelling hotel profitability and Kitapc et al. [10] in automotive industry.

Many studies use control variables to help explaining the variability in the response variable. Antoniou et al. [2] used equity premium, term-structure of interest rate, mergers and acquisitions (M&A) activity, laws and regulations, ownership concentration, creditor rights and anti-director rights as control variables. In addition, Hamid et al. [9] used firm size, sales growth and industry type as control variables.

RESEARCH METHODOLOGY

Sample and Data Collection

The research used panel data of the financial statement of 58 starch manufacturers, 8 ethanol manufacturers were collected during the years 2009-2013, when the pledging programs were in effect, from the Department of Business Development, Ministry of Commerce, Thailand. Ethanol manufacturers selected were those who solely use fresh cassava root as raw material. In addition, the list of cassava product manufacturers who participated in the pledging program in year 2013 was obtained from the Public Warehouse Organization (PWO), Ministry of Commerce, Thailand.

Dependent Variable, Research Variable and Control Variable

This study used the growth in ROA from year 2012 to 2013 as dependent variable. This is because the pledging prices are different from 2012 to 2013, hence, the growth in ROA from 2012 to 2013 would measure the change in financial performance of the companies that joined the program in 2013. Therefore, the research variable of interest is a variable that indicates whether or not a manufacturer joined the pledging program.

In addition, the control variables used in the model are estimated from the manufacturers' financial performance data, including cash ratio, inventory turnover, fixed assets turnover, total assets turnover, debt ratio, account payable turnover, payable deferral period, and debt to equity ratio from year 2009-2013. The summary of the variable is shown in Table 1 below.

Hypothesis Testing and Regression Modelling

To test the relationship between pledging policy and financial performance of cassava product manufacturers, the hypothesis can be stated as follow:

Ho: There is no association between cassava product manufacturers' financial performance and participation in pledging program.

H1: There is significant association between cassava product manufacturers' financial performance and participation pledging program.

The polynomial regression model contains the research variable and a set of control variables and their interaction terms. The interaction terms are included in order to remedy the lack-of-fits and model assumptions, i.e. normality and constant variance

TABLE 1: provides the list of response variable, research variable, and control variables.

Variables	Definition/formula
Dependent variable	
ROA	Return on asset = Net income / Assets
Research variable	
Manufacturers who join cassava pledging program in 2013 (PS)	Indicator variable, which takes on a value of 1, if a manufacturer joins the program, or 0 otherwise.
Control variable	
Cash ratio (CR)	Cash / Current liability
Inventory turnover (Inv)	Cost of goods sold / Average inventory
Fixed assets turnover (Fixed)	Net sales / Fixed asset
Total assets turnover (TAT)	Sales / Total assets
Debt ratio (DR)	Total debts / Total assets
Account payables turnover (APT)	Cost of goods sold / Average payable
Payable deferral period (PDP)	Payables / (Cost of goods sold / 365)
Debt to equity ratio (DER)	Total debts / Total assets

of the residuals. The full model that represents the relationship between the response and the research variable is as shown below:

$$\Delta ROA = \beta 0 + \beta_1 PS_t + \beta_2 CR_t + \beta_3 Inv_t + \beta_4 Fixed_t + \beta_5 TAT_t + \beta_6 DR_t + \beta_7 APT_t + \beta_8 PDP_t + \beta_9 DER_t + \beta_{10} PS_t * CR_t + \beta_{11} PS_t * PS_t + \beta n DER_{t-5} * DER_{t-5} + \varepsilon$$

where:

PS_t is the indicator variable indicating whether or not the manufacturers join the pledging program in 2013.

CR_t is cash ratio, cash over liability.

Inv_t is inventory turnover, cost of goods sold over average inventory.

$Fixed_t$ is fixed asset turnover, net sales over fixed asset.

TAT_t is total assets turnover, sales over total assets.

DR_t is debt ratio, total debts over total assets.

APT_t is an account payables turnover, cost of goods sold over account payable.

PDP_t is payable deferral period, payables over (cost of goods sold / 365).

DER_t is debt to equity ratio, total debt over total assets.

ε is an error term.

T is period, from 1 to 5 (2009–2013).

Normality and constant variance of residuals are tested, and indicate no violation in the assumptions. A final reduced model is then fitted using the stepwise regression. The final model contains only the research and the control variables, and their interactions, which are significant with p-value less than 0.05, to help describing the variability in the growth in ROA. The final model is also hierarchical such that the lower order terms of a significant are kept in the model regardless of their p-values.

RESULTS AND DISCUSSION

Model results are shown in Table 2. The research variable of interest, PS, is significant with p-value of 0.030. Its positive coefficient of 0.0463 indicates that the government pledging program is positively associated with growth in the ROA for both tapioca and ethanol manufacturers that participated in the program; even though the average pledging price in 2013 is slightly lower than 2012. Thus, a null hypothesis can be rejected.

CONCLUSIONS

The study investigates the relationship between the government pledging policy and the financial performance of the cassava product manufacturers measured in terms of growth in ROA. The model results suggested that the growth in ROA was positively associated with the participations of the manufacturers in the pledging program. In other words, the firm's financial performance was improved after joining the pledging program. This is consistent with the findings in the TDRI's report (2016) and Parthanadee et al. [12], which stated that most benefit from pledging program went to the manufacturers, while less benefit was received by the farmers. In addition, the benefit was only for a short term basis. In the long run, the government should help farmers by providing financial support in terms of low interest loan for farming and harvesting inputs such as fertilizers, harvesting equipment, rootstocks of new varieties, and irrigation system. The government should promote market-oriented policy or set price guarantee policy when necessary instead of setting pledging program.

Growth in ROA = $-0.0695 + 0.0463 PS - 0.0963\, CR3 + 0.1089\, CR4 + 0.000122\, Inv3 + 0.001352\, Inv4 - 0.2089\, TAT4 + 0.2499\, DR4 - 0.2503\, DR5 - 0.00265\, PDP3 - 0.002661$

Table 2: Regression model results.

Source	DF	Adj SS	Adj MS	F-Value	p-value
Regression	16	0.448913	0.028057	5.50	0.000
CR_3	1	0.000012	0.000012	0.00	0.961
CR_4	1	0.034355	0.034355	6.73	0.012
Inv_3	1	0.020444	0.020444	4.01	0.051
Inv_4	1	0.000040	0.000040	0.01	0.930
TAT_4	1	0.101614	0.101614	19.92	0.000
DR_4	1	0.040850	0.040850	8.01	0.007
DR_5	1	0.018923	0.018923	3.71	0.060
PDP_3	1	0.020520	0.020520	4.02	0.050
PDP_4	1	0.003678	0.003678	0.72	0.400
DER_1	1	0.183964	0.183964	36.06	0.000
TAT_4*TAT_4	1	0.197285	0.197285	38.67	0.000
PDP_4*PDP_4	1	0.048650	0.048650	9.54	0.003
CR_3*PDP_4	1	0.039655	0.039655	7.77	0.008
CR_4*Inv_4	1	0.040661	0.040661	7.97	0.007
DR_5*PDP_3	1	0.017875	0.017875	3.50	0.067
PS	1	0.025393	0.025393	4.98	0.030
Error	49	0.249955	0.005101		

$PDP_4 - 0.003705 \, DER_1 + 0.04009 \, TAT_4 * TAT_4 + 0.000018 \, PDP_4 * PDP_4 + 0.00374 \, DR_5 * PDP_3$

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