

Role of government funding on the empowerment of the Royal Project Foundation: A general equilibrium approach

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ABSTRACT

This study uses the latest SAM of Thailand in 2010 and the computable general equilibrium model (CGE) to quantify the economic impact of the RPF on the Thai economy. It will investigate the impacts of 15 scenarios which focus on the role of government funding in various situations. The analysis concludes that the RPF relies heavily on the increasing government funding. However, the funding seems not enough for many situations that negatively affect the economy of the RPF. The most severe case is the rising of both agricultural and food manufacturing costs. Between them, the rising agricultural cost is much more severe than the rising food manufacturing cost. The increasing labor cost is also critical to the economy of the RPF but its effect is less than those of the increasing agricultural and food manufacturing cost. Therefore, the government should not only focus on the direct assist to the RPF by its expansionary funding but also the indirect supports by monitoring and somehow controlling the costs in agricultural, food manufacturing sectors and labor cost to gradually increase rather than letting them increase sharply without any prior warning signal or even attempting to issue some policies to radically increase these costs.

Keywords: Royal Project Foundation, government funding, economic impact, computable general equilibrium, compensation

JEL Classification: C68, L31, H39

1. Introduction

Thailand aims to become the kitchen of the world. The Agro-industrial sector is a major opportunity for the economic growth of Thailand. The concept of Food Valley is at the national agenda to construct a complete cluster and network of agricultural production sites, leading to quality food production. The Royal Project Foundation (RPF) is one of major producers in the agro-industry sector of Thailand. Its merits to the Thai economy should be assessed. However, there is no quantitative study about the impact of the RPF on the nationwide economy of Thailand. This study will use the latest SAM of Thailand in 2010 and the computable general equilibrium model (CGE) to quantify the economic impact of the RPF on the Thai economy. It will investigate the impacts of 15 scenarios which focus on the role of government funding in various situations.

2. Methodology

This study uses a computable general equilibrium (CGE) model called KS-CGE Type IV. The model was modified from a CGE model of Professor Johannes Broecker, University of Kiel, Germany used in Suriya (2011) and Pathompituknukoon, Khingthong and Suriya (2012). It was also upgraded from KS-CGE Type III which was developed by Suriya and Sudtasan (2013). The model Type III performed effectively in Kanjanatarakul and Suriya (2012) while the model Type IV was specially designed to extract the Royal Project Foundation to be a separate sector.

The model uses the Social Accounting Matrix (SAM) of Thailand in 2010 for its database. In this study, the SAM includes 16 production sectors as follows:

- Sector 1: Agriculture
- Sector 2: Mining and quarrying
- Sector 3: Food manufacturing
- Sector 4: Textile industry
- Sector 5: Saw mills and food products
- Sector 6: Paper industries and printing
- Sector 7: Rubber, chemical and petroleum industries
- Sector 8: Non-metallic products
- Sector 9: Metal, metal products and industries
- Sector 10: Other manufacturing
- Sector 11: Public utilities
- Sector 12: Construction and others
- Sector 13: Trade
- Sector 14: Transportation and communication
- Sector 15: Services
- Sector 16: The Royal Project Foundation

The CGE analysis was divided into 15 scenarios as follows:

- Scenario 1: Increasing government funding to only RPF sector by 10%, 20% and 30%.
- Scenario 2: Increasing government funding to only RPF sector by 10% and export of RPF also increases 10%, 20% and 30%.

- Scenario 3: Increasing government funding to only RPF sector by 10% and household consumption of RPF's products also increases 10%, 20% and 30%.
- Scenario 4: Labor cost (wage) increase 10%, 19.52%, 20% and 30% across the board. The increase of 19.52% of the labor cost reflects the real situation when the government issues the Raising Income Policy which will lift the daily wage from THB251 to THB300.
- Scenario 5: Labor cost (wage) increases 19.52% and government funding to RPF increases 7.89%. This rate of expansionary government funding presents the realistic amount that the RPF would receive in the following year.
- Scenario 6: Labor cost (wage) increases 19.52% and the analysis will find the optimal increase of government funding to RPF that would neutralize the negative impact.
- Scenario 7: Production cost of agricultural sector (sector 1) increases 5%, 10% and 15% across the board.
- Scenario 8: Production cost of agricultural sector (sector 1) increases 10% and government funding to RPF increases 7.89%.
- Scenario 9: Production cost of agricultural sector (sector 1) increases 10% and the analysis will find the optimal increase of government funding to RPF that would neutralize the negative impact.
- Scenario 10: Production cost of food manufacturing sector (sector 3) increases 5%, 10% and 15% across the board.
- Scenario 11: Production cost of food manufacturing sector (sector 3) increases 10% and government funding to RPF increases 7.89%.
- Scenario 12: Production cost of food manufacturing sector (sector 3) increases 10% and the analysis will find the optimal increase of government funding to RPF that would neutralize the negative impact.
- Scenario 13: Production cost of agricultural sector (sector 1) and food manufacturing sector (sector 3) increase 10% at the same time across the board.
- Scenario 14: Production cost of agricultural sector (sector 1) and food manufacturing sector (sector 3) increase 10% at the same time and government funding to RPF increases 7.89%.
- Scenario 15: Production cost of agricultural sector (sector 1) and food manufacturing sector (sector 3) increase 10% at the same time and the analysis will find the optimal increase of government funding to RPF that would neutralize the negative impact.

3. Results

This section presents the results of the simulations of counterfactuals in 15 scenarios according to the changes of government funding to the Royal Project Foundation (RPF) with the situations of increasing demand from both external and domestic consumers, increasing labor cost and intermediate costs.

The results of scenario 1, an increase of government funding to only RPF by 10%, 20% and 30% will be presented in the following table.

Table 1: Scenario1: Increasing government funding to only RPF by 10%, 20% and 30%.

Increasing government funding to only RPF by 10%, 20% and 30%			
Sector	10%	20%	30%
Sector 1: Agriculture	0.00	0.01	0.01
Sector 2: Mining and quarrying	0.00	0.01	0.01
Sector 3: Food manufacturing	0.01	0.01	0.02
Sector 4: Textile industry	0.01	0.02	0.02
Sector 5: Saw mills and food products	0.01	0.01	0.02
Sector 6: Paper industries and printing	0.00	0.01	0.01
Sector 7: Rubber, chem & petroleum	0.00	0.01	0.01
Sector 8: Non-metallic products	0.00	0.01	0.01
Sector 9: Metal, metal prod & indust	0.01	0.01	0.02
Sector 10: Other manufacturing	0.01	0.02	0.03
Sector 11: Public utilities	0.00	0.01	0.01
Sec 12: Construction+ Sec16: Others	0.02	0.03	0.05
Sector 13: Trade	0.01	0.02	0.03
Sector 14: Transport and communication	0.01	0.02	0.02
Sector 15: Services	0.01	0.01	0.02
Sector 17: Royal Project Foundation	3.36	6.73	10.10
m-sector 1: Importers of agriculture	0.00	0.00	0.00
m-sector 2: Importers of mining	0.00	0.00	0.00
m-sector 3: Importers of food manufact	0.00	0.00	0.00
m-sector 4: Importers of textiles	0.00	0.00	0.00
m-sector 5: Importers of wood products	0.00	0.00	0.00
m-sector 6: Importers of paper	0.00	0.00	0.00
m-sector 7: Importers of rubb, chem,	0.00	0.00	0.00
m-sector 8: Importers of non-metalic	0.00	0.00	0.00
m-sector 9: Importers of matalic products	0.00	0.00	0.00
m-sector 10: Importers of other manufact	0.00	0.00	0.00
m-sector 11: Importers of utilities	0.00	0.00	0.00
m-sector 14: Importers of trans and	0.00	0.00	0.00
m-sector 15: Importers of services	0.00	0.00	0.00
m-sector 16: Importers of others	0.00	0.00	0.00
HH1: Poorest decile	0.01	0.01	0.02
HH2: Second poorest decile	0.01	0.01	0.02
HH3: Third poorest decile	0.01	0.01	0.02
HH4: Fourth poorest decile	0.01	0.01	0.02
HH5: Lowest middle decile	0.01	0.01	0.02
HH6: Lower middle decile	0.01	0.01	0.02
HH7: Higher middle decile	0.01	0.01	0.02
HH8: Highest middle decile	0.01	0.01	0.02
HH9: Second richest decile	0.01	0.01	0.02
HH10: Richest decile	0.00	0.01	0.01
ENT: Institutions	0.00	0.01	0.01
GOV: Government	0.00	0.00	0.01

Increasing government funding to only RPF by 10%, 20% and 30%			
Sector	10%	20%	30%
MARGIN: Transaction costs	0.01	0.02	0.03
TAX: Taxation	0.00	0.00	0.01
GDP Growth	0.00	0.01	0.01
Inflation	0.00	0.00	0.00

Source: Simulation using KS-CGE model Type IV in Matlab.

The increase of government funding to the RPF (sector 17) is a generator of the RPF's economic growth. By raising 10% of the funding, the RPF will grow around 3.36%. The number is doubled and tripled when the funding rises 20% and 30% respectively. The channel of the growth is that the RPF will use this funding to expand her production. It should be noted that this case is under the stable demand from both domestic and external consumers. Therefore, the increasing supply of the RPF's products will reduce the products' prices. The whole economy will benefit from this expansion of the RPF such as food manufacturing (sector 3) and households. However, the effect on the whole economy is not so significant such that the GDP is quite unchanged. This is because the income of the RPF sector is so small, THB1.24 million Baht, compared to the values of whole economy of around THB32,000 million Baht.

The results of scenario 2, an increase of government funding to only RPF by 10% and export of RPF also increases 10% 20% 30% will be presented in the following table.

Table 2: Scenario 2: Increasing government funding to only RPF by 10% and export of RPF also increases 10%, 20% and 30%.

Increasing government funding to only RPF by 10% and export of RPF also increases 10%, 20% and 30%			
Sector	10%	20%	30%
Sector 1: Agriculture	0.00	0.00	0.00
Sector 2: Mining and quarrying	0.00	0.00	0.00
Sector 3: Food manufacturing	0.00	0.00	-0.01
Sector 4: Textile industry	0.00	0.00	-0.01
Sector 5: Saw mills and food products	0.00	0.00	0.00
Sector 6: Paper industries and printing	0.00	0.00	0.00
Sector 7: Rubber, chem & petroleum	0.00	0.00	0.00
Sector 8: Non-metallic products	0.00	0.00	0.00
Sector 9: Metal, metal prod & indust	0.00	0.00	0.00
Sector 10: Other manufacturing	0.00	0.00	-0.01
Sector 11: Public utilities	0.00	0.00	0.00
Sec 12: Construction+ Sec16: Others	0.01	0.00	-0.01
Sector 13: Trade	0.00	0.00	0.00
Sector 14: Transport and communication	0.00	0.00	-0.01
Sector 15: Services	0.00	0.00	0.00
Sector 17: Royal Project Foundation	2.86	2.36	1.86
m-sector 1: Importers of agriculture	0.00	0.00	0.00

Increasing government funding to only RPF by 10% and export of RPF also increases 10%, 20% and 30%			
Sector	10%	20%	30%
m-sector 2: Importers of mining	0.00	0.00	0.00
m-sector 3: Importers of food manufact	0.00	0.00	0.00
m-sector 4: Importers of textiles	0.00	0.00	0.00
m-sector 5: Importers of wood products	0.00	0.00	0.00
m-sector 6: Importers of paper	0.00	0.00	0.00
m-sector 7: Importers of rubb, chem,	0.00	0.00	0.00
m-sector 8: Importers of non-metalic	0.00	0.00	0.00
m-sector 9: Importers of matalic products	0.00	0.00	0.00
m-sector 10: Importers of other manufact	0.00	0.00	0.00
m-sector 11: Importers of utilities	0.00	0.00	0.00
m-sector 14: Importers of trans and	0.00	0.00	0.00
m-sector 15: Importers of services	0.00	0.00	0.00
m-sector 16: Importers of others	0.00	0.00	0.00
HH1: Poorest decile	0.00	0.00	0.00
HH2: Second poorest decile	0.00	0.00	0.00
HH3: Third poorest decile	0.00	0.00	0.00
HH4: Fourth poorest decile	0.00	0.00	0.00
HH5: Lowest middle decile	0.00	0.00	0.00
HH6: Lower middle decile	0.00	0.00	0.00
HH7: Higher middle decile	0.00	0.00	0.00
HH8: Highest middle decile	0.00	0.00	0.00
HH9: Second richest decile	0.00	0.00	0.00
HH10: Richest decile	0.00	0.00	0.00
ENT: Institutions	0.00	0.00	0.00
GOV: Government	0.00	0.00	0.00
MARGIN: Transaction costs	0.00	0.00	-0.01
TAX: Taxation	0.00	0.00	0.00
GDP Growth	0.00	0.00	0.00
Inflation	0.00	0.00	0.00

Source: Simulation using KS-CGE model Type IV in Matlab.

In this situation, the RPF receives an increase government funding of 10% and uses it to expand her production. At the same time, the external demand for the RPF products increase. Then the RPF will allocate a portion of products to export to the rest of the world. This will cause the shortage of the supply in the domestic market which will lift the price of RPF's product. Therefore, the RPF will grow but at a slower pace than in the case of stable demand. As seen from the results, the RPF will grow around 2.86% compared to 3.36% in the case of stable demand.

The results of scenario 3, an increase of government funding to only RPF by 10% and household consumption of RPF also increases 10% 20% 30% will be presented in the following table.

Table 3: Scenario 3: Increasing government funding to only RPF by 10% and household consumption of RPF also increases 10%, 20% and 30%.

Increasing government funding to only RPF by 10% and export of RPF also increases 10%, 20% and 30%			
Sector	10%	20%	30%
Sector 1: Agriculture	0.00	0.00	0.00
Sector 2: Mining and quarrying	0.00	0.00	0.00
Sector 3: Food manufacturing	0.00	0.01	0.00
Sector 4: Textile industry	0.00	0.01	0.01
Sector 5: Saw mills and food products	0.00	0.00	0.00
Sector 6: Paper industries and printing	0.00	0.00	0.00
Sector 7: Rubber, chem & petroleum	0.00	0.00	0.00
Sector 8: Non-metallic products	0.00	0.00	0.00
Sector 9: Metal, metal prod & indust	0.00	0.01	0.00
Sector 10: Other manufacturing	0.00	0.01	0.01
Sector 11: Public utilities	0.00	0.00	0.00
Sec 12: Construction+ Sec16: Others	0.01	0.01	0.01
Sector 13: Trade	0.00	0.01	0.00
Sector 14: Transport and communication	0.00	0.01	0.01
Sector 15: Services	0.00	0.00	0.00
Sector 17: Royal Project Foundation	3.28	3.21	3.13
m-sector 1: Importers of agriculture	0.00	0.00	0.00
m-sector 2: Importers of mining	0.00	0.00	0.00
m-sector 3: Importers of food manufact	0.00	0.00	0.00
m-sector 4: Importers of textiles	0.00	0.00	0.00
m-sector 5: Importers of wood products	0.00	0.00	0.00
m-sector 6: Importers of paper	0.00	0.00	0.00
m-sector 7: Importers of rubb, chem,	0.00	0.00	0.00
m-sector 8: Importers of non-metalic	0.00	0.00	0.00
m-sector 9: Importers of matalic products	0.00	0.00	0.00
m-sector 10: Importers of other manufact	0.00	0.00	0.00
m-sector 11: Importers of utilities	0.00	0.00	0.00
m-sector 14: Importers of trans and	0.00	0.00	0.00
m-sector 15: Importers of services	0.00	0.00	0.00
m-sector 16: Importers of others	0.00	0.00	0.00
HH1: Poorest decile	0.00	0.00	0.00
HH2: Second poorest decile	0.00	0.00	0.00
HH3: Third poorest decile	0.00	0.00	0.00
HH4: Fourth poorest decile	0.00	0.00	0.00
HH5: Lowest middle decile	0.00	0.00	0.00
HH6: Lower middle decile	0.00	0.00	0.00
HH7: Higher middle decile	0.00	0.00	0.00
HH8: Highest middle decile	0.00	0.00	0.00
HH9: Second richest decile	0.00	0.01	0.01
HH10: Richest decile	0.00	0.00	0.00
ENT: Institutions	0.00	0.00	0.00

Increasing government funding to only RPF by 10% and export of RPF also increases 10%, 20% and 30%			
Sector	10%	20%	30%
GOV: Government	0.00	0.00	0.00
MARGIN: Transaction costs	0.00	0.01	0.01
TAX: Taxation	0.00	0.00	0.00
GDP Growth	0.00	0.00	0.00
Inflation	0.00	0.00	0.00

Source: Simulation using KS-CGE model Type IV in Matlab.

When the government increases her funding to the RPF by 10% which the RPF uses it for the expansion of the production, and at the same time that the demand of domestic consumers rises around 10%, the results show that RPF will benefit from this situation by the growth of around 3.28%. This number is larger than that in the case of expansion of external trades (2.86%) but less than that in the case of just the expansion of government funding with stable demand (3.36%). This is because the rising demand in domestic market will raise the price of the RPF's products but the supply of the products are in the domestic market, therefore the price will not rise too much. The rising price will lift the costs of some other related sectors, then the economy will grow but at a slower rate than the case of the stable demand.

The results of scenario 4, labor cost (wage) increases 10% 20% 30%, will be presented in the following table.

Table 4: Scenario 4: Labor cost (wage) increases 10%, 19.52%, 20% and 30%.

Labor cost (wage) increase by 10%, 19.52%, 20% and 30%				
Sector	10%	19.52%	20%	30%
Sector 1: Agriculture	-4.41	-7.76	-7.91	-10.75
Sector 2: Mining and quarrying	-4.54	-7.98	-8.13	-11.05
Sector 3: Food manufacturing	-7.18	-12.63	-12.88	-17.49
Sector 4: Textile industry	-8.37	-14.72	-15.01	-20.39
Sector 5: Saw mills and food products	-6.31	-11.10	-11.32	-15.38
Sector 6: Paper industries and printing	-4.32	-7.59	-7.74	-10.51
Sector 7: Rubber, chem & petroleum	-3.67	-6.46	-6.58	-8.95
Sector 8: Non-metallic products	-3.96	-6.96	-7.09	-9.64
Sector 9: Metal, metal prod & indust	-7.18	-12.63	-12.87	-17.49
Sector 10: Other manufacturing	-9.60	-16.88	-17.21	-23.38
Sector 11: Public utilities	-4.44	-7.80	-7.96	-10.81
Sec 12: Construction+ Sec16: Others	-16.71	-29.39	-29.96	-40.71
Sector 13: Trade	-8.53	-14.99	-15.28	-20.76
Sector 14: Transport and	-8.89	-15.63	-15.93	-21.64
Sector 15: Services	-5.48	-9.63	-9.81	-13.33
Sector 17: Royal Project Foundation	-6.45	-11.34	-11.57	-15.71
m-sector 1: Importers of agriculture	-0.07	-0.13	-0.13	-0.18
m-sector 2: Importers of mining	-1.15	-2.03	-2.07	-2.81

Labor cost (wage) increase by 10%, 19.52%, 20% and 30%				
Sector	10%	19.52%	20%	30%
m-sector 3: Importers of food	-0.31	-0.54	-0.55	-0.75
m-sector 4: Importers of textiles	-0.12	-0.21	-0.21	-0.29
m-sector 5: Importers of wood	-0.15	-0.26	-0.26	-0.35
m-sector 6: Importers of paper	-0.16	-0.29	-0.29	-0.40
m-sector 7: Importers of rubb, chem,	-0.18	-0.31	-0.32	-0.43
m-sector 8: Importers of non-metalic	-0.24	-0.41	-0.42	-0.57
m-sector 9: Importers of matalic	-0.20	-0.36	-0.36	-0.49
m-sector 10: Importers of other	-0.13	-0.23	-0.24	-0.32
m-sector 11: Importers of utilities	-0.07	-0.13	-0.13	-0.18
m-sector 14: Importers of trans and	0.00	0.00	0.00	0.00
m-sector 15: Importers of services	0.00	0.00	0.00	0.00
m-sector 16: Importers of others	-0.02	-0.03	-0.04	-0.05
HH1: Poorest decile	-5.66	-9.95	-10.15	-13.79
HH2: Second poorest decile	-5.73	-10.08	-10.28	-13.96
HH3: Third poorest decile	-5.87	-10.33	-10.53	-14.31
HH4: Fourth poorest decile	-5.84	-10.27	-10.47	-14.22
HH5: Lowest middle decile	-5.67	-9.96	-10.16	-13.80
HH6: Lower middle decile	-5.75	-10.11	-10.31	-14.01
HH7: Higher middle decile	-5.56	-9.77	-9.96	-13.53
HH8: Highest middle decile	-5.61	-9.86	-10.05	-13.66
HH9: Second richest decile	-5.39	-9.47	-9.66	-13.12
HH10: Richest decile	-4.53	-7.96	-8.12	-11.03
ENT: Institutions	-3.12	-5.49	-5.60	-7.60
GOV: Government	-2.20	-3.87	-3.95	-5.37
MARGIN: Transaction costs	-8.63	-15.18	-15.47	-21.02
TAX: Taxation	-2.20	-3.87	-3.95	-5.37
GDP Growth	-3.70	-6.51	-6.64	-9.02
Inflation	-3.67	-6.45	-6.58	-8.93

Source: Simulation using KS-CGE model Type IV in Matlab.

The scenario shows that the 10% increase of the labor cost will cause the RPF's economy drop by around 6.5%. When it simulates the counterfactual of the Raising Income Policy of the government which will lift the wage from THB251 per day to THB300, it discovers that the economy of the RPF will fall around 11%. Other major industries such as agriculture (sector 1) and food manufacturing (sector 3) will also suffer from the recession of around 8% and 13% respectively. The government budget will decrease around 4%. Household income will also drop around 8% to 11%. Households in the third and fourth decile (third and fourth poorest) will be the ones who suffer the most among other households. Overall GDP will drop around 6.5%.

An important point of the interpretation of the numbers of the GDP growth is at the middle-term prediction. KS-CGE model does not present the annual growth rate of the GDP but the growth rate for approximately 5 years. For example, when the number shows that the GDP will drop around 6.5%, this may happen in 5 years. Therefore, the

annual growth rate should be divided by 5. Then the result should be converted to be around minus 1.3% per year. This result is well calibrated with the prediction of Bank of Thailand on the effect of the increasing labor cost on the Thai economy.

From the results, the economy will experience the deflation of 6.45%. In this aspect, it should be noted that this results come out because the KS-CGE model Type IV cannot capture the stagflation problem, the rising cost will cause both rising price and unemployment at the same time.

The results of scenario 5, labor cost (wage) increase 19.52% and Government funding to RPF increases by 7.89% will be presented in the following table.

Table 5: Scenario 5: Labor cost (wage) increases 19.52% and government funding to RPF increases by 7.89%.

Sector	Results
Sector 1: Agriculture	-7.76
Sector 2: Mining and quarrying	-7.98
Sector 3: Food manufacturing	-12.63
Sector 4: Textile industry	-14.72
Sector 5: Saw mills and food products	-11.10
Sector 6: Paper industries and printing	-7.59
Sector 7: Rubber, chem & petroleum indust	-6.46
Sector 8: Non-metallic products	-6.96
Sector 9: Metal, metal prod & indust	-12.62
Sector 10: Other manufacturing	-16.87
Sector 11: Public utilities	-7.80
Sec 12: Construction+ Sec16: Others	-29.38
Sector 13: Trade	-14.98
Sector 14: Transport and communication	-15.62
Sector 15: Services	-9.62
Sector 17: Royal Project Foundation	-8.98
m-sector 1: Importers of agriculture	-0.13
m-sector 2: Importers of mining	-2.03
m-sector 3: Importers of food manufact	-0.54
m-sector 4: Importers of textiles	-0.21
m-sector 5: Importers of wood products	-0.26
m-sector 6: Importers of paper	-0.29
m-sector 7: Importers of rubb, chem, petro	-0.31
m-sector 8: Importers of non-metalic prod	-0.41
m-sector 9: Importers of matalic products	-0.36
m-sector 10: Importers of other manufact	-0.23
m-sector 11: Importers of utilities	-0.13
m-sector 14: Importers of trans and telecom	0.00
m-sector 15: Importers of services	0.00
m-sector 16: Importers of others	-0.03
HH1: Poorest decile	-9.95
HH2: Second poorest decile	-10.08

Sector	Results
HH3: Third poorest decile	-10.32
HH4: Fourth poorest decile	-10.26
HH5: Lowest middle decile	-9.96
HH6: Lower middle decile	-10.11
HH7: Higher middle decile	-9.76
HH8: Highest middle decile	-9.86
HH9: Second richest decile	-9.47
HH10: Richest decile	-7.96
ENT: Institutions	-5.49
GOV: Government	-3.87
MARGIN: Transaction costs	-15.17
TAX: Taxation	-3.87
GDP Growth	-6.51
Inflation	-6.45

Source: Simulation using KS-CGE model Type IV in Matlab.

It is clear that the increase of 7.89% of the government funding to the RPF is not enough to compensate the increasing labor cost of 19.52%. The RPF will still suffer from the recession of around 9%. Overall economy will also drop around 6.5%.

The results of scenario 6, labor cost (wage) increase 19.52% and find the optimal increase of government funding to RPF that would neutralize the negative impact will be presented in the following table.

Table 6: Scenario 6: Labor cost (wage) increases 19.52% and the study will find the optimal increase of government funding to RPF that would neutralize the negative impact.

Sector	Results
Sector 1: Agriculture	-7.75
Sector 2: Mining and quarrying	-7.96
Sector 3: Food manufacturing	-12.61
Sector 4: Textile industry	-14.70
Sector 5: Saw mills and food products	-11.08
Sector 6: Paper industries and printing	-7.58
Sector 7: Rubber, chem & petroleum indust	-6.45
Sector 8: Non-metallic products	-6.95
Sector 9: Metal, metal prod & indust	-12.60
Sector 10: Other manufacturing	-16.85
Sector 11: Public utilities	-7.79
Sec 12: Construction+ Sec16: Others	-29.33
Sector 13: Trade	-14.96
Sector 14: Transport and communication	-15.60
Sector 15: Services	-9.61
Sector 17: Royal Project Foundation	0.00
m-sector 1: Importers of agriculture	-0.13

Sector	Results
m-sector 2: Importers of mining	-2.02
m-sector 3: Importers of food manufact	-0.54
m-sector 4: Importers of textiles	-0.21
m-sector 5: Importers of wood products	-0.26
m-sector 6: Importers of paper	-0.29
m-sector 7: Importers of rubb, chem, petro	-0.31
m-sector 8: Importers of non-metalic prod	-0.41
m-sector 9: Importers of matalic products	-0.36
m-sector 10: Importers of other manufact	-0.23
m-sector 11: Importers of utilities	-0.13
m-sector 14: Importers of trans and telecom	0.00
m-sector 15: Importers of services	0.00
m-sector 16: Importers of others	-0.03
HH1: Poorest decile	-9.93
HH2: Second poorest decile	-10.06
HH3: Third poorest decile	-10.31
HH4: Fourth poorest decile	-10.25
HH5: Lowest middle decile	-9.94
HH6: Lower middle decile	-10.09
HH7: Higher middle decile	-9.75
HH8: Highest middle decile	-9.84
HH9: Second richest decile	-9.45
HH10: Richest decile	-7.95
ENT: Institutions	-5.48
GOV: Government	-3.87
MARGIN: Transaction costs	-15.15
TAX: Taxation	-3.87
GDP Growth	-6.50
Inflation	-6.45

Source: Simulation using KS-CGE model Type IV in Matlab.

The government needs to increase her fund to the RPF by at least 37.80% to neutralize the effect of increasing labor cost. The increasing fund should be around THB143 million even though the increasing labor cost that the RPF needs to spend more is around THB37 million. It is clear that labor cost is included in every production. Therefore, its effect on the Thai economy is huge. Just the 19.52% increase of the labor cost will cause all industries to raise their prices or suffer from less profit. This will cause the whole economy drop into recession of around 6.5%. The long term price will fall and demonstrate the deflation around 6.45% too.

The results of scenario 7, production cost of sector 1 (agriculture) increases by 5% 10% 15% will be presented in the following table.

Table 7: Scenario 7: Production cost of sector 1 (agriculture) increases by 5%, 10% and 15%.

Production cost of sector 1 (agriculture) increases by 5%, 10% and 15%			
Sector	5%	10%	15%
Sector 1: Agriculture	-7.47	-13.77	-19.15
Sector 2: Mining and quarrying	-7.63	-14.06	-19.55
Sector 3: Food manufacturing	-12.14	-22.37	-31.11
Sector 4: Textile industry	-14.08	-25.96	-36.09
Sector 5: Saw mills and food products	-10.62	-19.57	-27.21
Sector 6: Paper industries and printing	-7.25	-13.37	-18.59
Sector 7: Rubber, chem & petroleum	-6.18	-11.39	-15.84
Sector 8: Non-metallic products	-6.65	-12.26	-17.05
Sector 9: Metal, metal prod & indust	-12.07	-22.25	-30.94
Sector 10: Other manufacturing	-16.15	-29.78	-41.40
Sector 11: Public utilities	-7.46	-13.75	-19.12
Sec 12: Construction+ Sec16: Others	-28.10	-51.82	-72.08
Sector 13: Trade	-14.34	-26.44	-36.77
Sector 14: Transport and communication	-14.94	-27.54	-38.29
Sector 15: Services	-9.22	-16.99	-23.63
Sector 17: Royal Project Foundation	-10.84	-19.99	-27.79
m-sector 1: Importers of agriculture	-0.12	-0.22	-0.31
m-sector 2: Importers of mining	-1.94	-3.58	-4.98
m-sector 3: Importers of food manufact	-0.52	-0.95	-1.33
m-sector 4: Importers of textiles	-0.20	-0.37	-0.51
m-sector 5: Importers of wood products	-0.25	-0.45	-0.63
m-sector 6: Importers of paper	-0.28	-0.51	-0.71
m-sector 7: Importers of rubb, chem,	-0.30	-0.55	-0.76
m-sector 8: Importers of non-metalic	-0.40	-0.73	-1.02
m-sector 9: Importers of matalic products	-0.34	-0.63	-0.88
m-sector 10: Importers of other manufact	-0.22	-0.41	-0.57
m-sector 11: Importers of utilities	-0.12	-0.22	-0.31
m-sector 14: Importers of trans and	0.00	0.00	0.00
m-sector 15: Importers of services	0.00	0.00	0.00
m-sector 16: Importers of others	-0.03	-0.06	-0.08
HH1: Poorest decile	-9.38	-17.29	-24.03
HH2: Second poorest decile	-9.50	-17.51	-24.35
HH3: Third poorest decile	-9.74	-17.95	-24.95
HH4: Fourth poorest decile	-9.68	-17.84	-24.80
HH5: Lowest middle decile	-9.55	-17.61	-24.49
HH6: Lower middle decile	-9.70	-17.87	-24.85
HH7: Higher middle decile	-9.36	-17.26	-24.00
HH8: Highest middle decile	-9.45	-17.43	-24.23
HH9: Second richest decile	-9.08	-16.73	-23.27
HH10: Richest decile	-7.63	-14.07	-19.56
ENT: Institutions	-5.25	-9.68	-13.46

Production cost of sector 1 (agriculture) increases by 5%, 10% and 15%			
Sector	5%	10%	15%
GOV: Government	-3.71	-6.84	-9.51
MARGIN: Transaction costs	-14.53	-26.78	-37.24
TAX: Taxation	-3.71	-6.84	-9.51
GDP Growth	-6.23	-11.49	-15.98
Inflation	-6.19	-11.40	-15.83

Source: Simulation using KS-CGE model Type IV in Matlab.

The rising intermediate cost of agricultural sector (sector 1) will harm the Thai economy enormously. The RPF sector will fall almost at the double rate compared to the increasing rate of the agricultural cost. When the cost rises 10%, the RPF will fall around 20%. Other sectors will be negatively affected as a whole. Agricultural sector will also fall around 14% too. Food manufacturing sector (sector 3) will suffer from the recession around 22%. Every household decile will experience the reduction of their income around 14% to 18%. The government will lose its income around 7%. The overall economy reflected by the GDP growth will be around minus 11.5%. The deflation of around 11.4% will cover the Thai economy.

The results of scenario 8, production cost of sector 1 (agriculture) increases by 10% and government funding to RPF increase by 7.89% will be presented in the following table.

Table 8: Scenario 8: Production cost of sector 1 (agriculture) increases by 10% and government funding to RPF increases by 7.89%.

Sector	Results
Sector 1: Agriculture	-13.77
Sector 2: Mining and quarrying	-14.06
Sector 3: Food manufacturing	-22.37
Sector 4: Textile industry	-25.95
Sector 5: Saw mills and food products	-19.57
Sector 6: Paper industries and printing	-13.36
Sector 7: Rubber, chem & petroleum indust	-11.39
Sector 8: Non-metallic products	-12.26
Sector 9: Metal, metal prod & indust	-22.25
Sector 10: Other manufacturing	-29.77
Sector 11: Public utilities	-13.75
Sec 12: Construction+ Sec16: Others	-51.81
Sector 13: Trade	-26.43
Sector 14: Transport and communication	-27.54
Sector 15: Services	-16.99
Sector 17: Royal Project Foundation	-17.85
m-sector 1: Importers of agriculture	-0.22
m-sector 2: Importers of mining	-3.58
m-sector 3: Importers of food manufact	-0.95
m-sector 4: Importers of textiles	-0.37
m-sector 5: Importers of wood products	-0.45

Sector	Results
m-sector 6: Importers of paper	-0.51
m-sector 7: Importers of rubb, chem, petro	-0.55
m-sector 8: Importers of non-metalic prod	-0.73
m-sector 9: Importers of matalic products	-0.63
m-sector 10: Importers of other manufact	-0.41
m-sector 11: Importers of utilities	-0.22
m-sector 14: Importers of trans and telecom	0.00
m-sector 15: Importers of services	0.00
m-sector 16: Importers of others	-0.06
HH1: Poorest decile	-17.28
HH2: Second poorest decile	-17.51
HH3: Third poorest decile	-17.94
HH4: Fourth poorest decile	-17.83
HH5: Lowest middle decile	-17.61
HH6: Lower middle decile	-17.87
HH7: Higher middle decile	-17.26
HH8: Highest middle decile	-17.42
HH9: Second richest decile	-16.73
HH10: Richest decile	-14.07
ENT: Institutions	-9.68
GOV: Government	-6.83
MARGIN: Transaction costs	-26.77
TAX: Taxation	-6.83
GDP Growth	-11.49
Inflation	-11.40

Source: Simulation using KS-CGE model Type IV in Matlab.

The results show that the increase of government funding just around 7.89% will not be able to help the RPF to recover its economy when the cost of agricultural sector (sector 1) rises 10%. The economy of the RPF will still fall around 18%. At the same time, agricultural sector will also affected by its rising cost. Its economy will shrink around 14%. Another related sector, the food manufacturing (sector 3) will be under recession of around 22%.

The results of scenario 9, production cost of sector 1: (agriculture) increases by 10% and find the optimal increase of government funding to RPF that would neutralize the negative impact.

Table 9: Scenario 9: Production cost of sector 1 (agriculture) increases by 10% and the study will find the optimal increase of government funding to RPF that would neutralize the negative impact.

Sector	Results
Sector 1: Agriculture	-13.75
Sector 2: Mining and quarrying	-14.03

Sector	Results
Sector 3: Food manufacturing	-22.33
Sector 4: Textile industry	-25.91
Sector 5: Saw mills and food products	-19.54
Sector 6: Paper industries and printing	-13.34
Sector 7: Rubber, chem & petroleum indust	-11.37
Sector 8: Non-metallic products	-12.24
Sector 9: Metal, metal prod & indust	-22.21
Sector 10: Other manufacturing	-29.72
Sector 11: Public utilities	-13.73
Sec 12: Construction+ Sec16: Others	-51.72
Sector 13: Trade	-26.38
Sector 14: Transport and communication	-27.49
Sector 15: Services	-16.96
Sector 17: Royal Project Foundation	0.00
m-sector 1: Importers of agriculture	-0.22
m-sector 2: Importers of mining	-3.57
m-sector 3: Importers of food manufact	-0.95
m-sector 4: Importers of textiles	-0.37
m-sector 5: Importers of wood products	-0.45
m-sector 6: Importers of paper	-0.51
m-sector 7: Importers of rubb, chem, petro	-0.55
m-sector 8: Importers of non-metalic prod	-0.73
m-sector 9: Importers of matalic products	-0.63
m-sector 10: Importers of other manufact	-0.41
m-sector 11: Importers of utilities	-0.22
m-sector 14: Importers of trans and telecom	0.00
m-sector 15: Importers of services	0.00
m-sector 16: Importers of others	-0.06
HH1: Poorest decile	-17.25
HH2: Second poorest decile	-17.48
HH3: Third poorest decile	-17.91
HH4: Fourth poorest decile	-17.80
HH5: Lowest middle decile	-17.58
HH6: Lower middle decile	-17.84
HH7: Higher middle decile	-17.23
HH8: Highest middle decile	-17.39
HH9: Second richest decile	-16.70
HH10: Richest decile	-14.04
ENT: Institutions	-9.66
GOV: Government	-6.82
MARGIN: Transaction costs	-26.72
TAX: Taxation	-6.82
GDP Growth	-11.47
Inflation	-11.39

Source: Simulation using KS-CGE model Type IV in Matlab.

The government needs to increase the funding to the RPF by 73% to neutralize the negative impact from the rising intermediate costs of agricultural sector (sector 1) by 10%. When the based funding is THB380 million, then the government should support around THB280 million to the RPF. While the RPF buys from agricultural sector around THB121 million baht per year in 2010. The increasing cost makes the RPF to spend THB12 million baht more to cover the cost. However, the reason why the RPF needs much more than that (THB280 million baht in comparison with THB12 million baht) is because the rising agricultural cost will lead to the rises of costs in other industries and especially the labor costs. Therefore, the impact of the rising agricultural cost is more enormous than the rough calculation just for the nominal increase of the cost that the RPF buys products from agricultural sector.

The results of scenario 10, production cost of sector 3 (food manufacturing) increases by 5%, 10%, 15% will be presented in the following table.

Table 10: Scenario 10: Production cost of sector 3 (food manufacturing) increases by 5%, 10% and 15%.

Production cost of sector 3 (food manufacturing) increases by 5%, 10% and 15%			
Sector	5%	10%	15%
Sector 1: Agriculture	-4.96	-9.10	-12.59
Sector 2: Mining and quarrying	-5.10	-9.35	-12.94
Sector 3: Food manufacturing	-8.10	-14.86	-20.56
Sector 4: Textile industry	-9.41	-17.25	-23.87
Sector 5: Saw mills and food products	-7.09	-13.00	-17.99
Sector 6: Paper industries and printing	-4.85	-8.89	-12.30
Sector 7: Rubber, chem & petroleum	-4.13	-7.57	-10.47
Sector 8: Non-metallic products	-4.45	-8.15	-11.28
Sector 9: Metal, metal prod & indust	-8.07	-14.79	-20.47
Sector 10: Other manufacturing	-10.79	-19.79	-27.39
Sector 11: Public utilities	-4.99	-9.14	-12.65
Sec 12: Construction+ Sec16: Others	-18.78	-34.44	-47.66
Sector 13: Trade	-9.58	-17.57	-24.31
Sector 14: Transport and communication	-9.98	-18.31	-25.34
Sector 15: Services	-6.16	-11.29	-15.63
Sector 17: Royal Project Foundation	-7.24	-13.28	-18.37
m-sector 1: Importers of agriculture	-0.08	-0.15	-0.21
m-sector 2: Importers of mining	-1.30	-2.38	-3.29
m-sector 3: Importers of food manufact	-0.35	-0.63	-0.88
m-sector 4: Importers of textiles	-0.13	-0.25	-0.34
m-sector 5: Importers of wood products	-0.16	-0.30	-0.42
m-sector 6: Importers of paper	-0.18	-0.34	-0.47
m-sector 7: Importers of rubb, chem,	-0.20	-0.36	-0.50
m-sector 8: Importers of non-metalic	-0.26	-0.49	-0.67
m-sector 9: Importers of matalic products	-0.23	-0.42	-0.58
m-sector 10: Importers of other manufact	-0.15	-0.27	-0.38

Production cost of sector 3 (food manufacturing) increases by 5%, 10% and 15%			
Sector	5%	10%	15%
m-sector 11: Importers of utilities	-0.08	-0.15	-0.21
m-sector 14: Importers of trans and	0.00	0.00	0.00
m-sector 15: Importers of services	0.00	0.00	0.00
m-sector 16: Importers of others	-0.02	-0.04	-0.06
HH1: Poorest decile	-6.26	-11.48	-15.88
HH2: Second poorest decile	-6.34	-11.63	-16.09
HH3: Third poorest decile	-6.50	-11.92	-16.49
HH4: Fourth poorest decile	-6.46	-11.85	-16.39
HH5: Lowest middle decile	-6.38	-11.69	-16.18
HH6: Lower middle decile	-6.47	-11.87	-16.43
HH7: Higher middle decile	-6.25	-11.46	-15.86
HH8: Highest middle decile	-6.31	-11.58	-16.02
HH9: Second richest decile	-6.06	-11.12	-15.38
HH10: Richest decile	-5.10	-9.35	-12.93
ENT: Institutions	-3.51	-6.43	-8.90
GOV: Government	-2.48	-4.54	-6.29
MARGIN: Transaction costs	-9.71	-17.80	-24.63
TAX: Taxation	-2.48	-4.54	-6.29
GDP Growth	-4.16	-7.63	-10.56
Inflation	-4.13	-7.57	-10.48

Source: Simulation using KS-CGE model Type IV in Matlab.

The rise of the intermediate cost of food processing sector (sector 3) is harmful to the RPF but the scale is less than the case of rising costs of agricultural products. The RPF will experience the drop of around 13% of its economy when the cost rise 10%. Agricultural sector (sector 1) and food manufacturing sector (sector 3) will also experience the shrinkage of their economies around 9% and 15% respectively under the rising around 10% of the cost. Households also suffer around 9% to 11%. Taxes will be reduced around 2.5% leading to the same portion of the decreasing of the government budget. GDP will drop around 4% with the almost the same rate of the inflation situation.

The results of scenario 11, production cost of sector 3 (food manufacturing) increases by 10% and government funding to RPF increase by 7.89% will be presented in the following table.

Table 11: Scenario 11: Production cost of sector 3 (food manufacturing) increases by 10% and government funding to RPF increases by 7.89%.

Sector	Results
Sector 1: Agriculture	-9.09
Sector 2: Mining and quarrying	-9.35
Sector 3: Food manufacturing	-14.85

Sector	Results
Sector 4: Textile industry	-17.25
Sector 5: Saw mills and food products	-13.00
Sector 6: Paper industries and printing	-8.89
Sector 7: Rubber, chem & petroleum indust	-7.57
Sector 8: Non-metallic products	-8.15
Sector 9: Metal, metal prod & indust	-14.79
Sector 10: Other manufacturing	-19.79
Sector 11: Public utilities	-9.14
Sec 12: Construction+ Sec16: Others	-34.43
Sector 13: Trade	-17.56
Sector 14: Transport and communication	-18.30
Sector 15: Services	-11.29
Sector 17: Royal Project Foundation	-10.96
m-sector 1: Importers of agriculture	-0.15
m-sector 2: Importers of mining	-2.38
m-sector 3: Importers of food manufact	-0.63
m-sector 4: Importers of textiles	-0.25
m-sector 5: Importers of wood products	-0.30
m-sector 6: Importers of paper	-0.34
m-sector 7: Importers of rubb, chem, petro	-0.36
m-sector 8: Importers of non-metalic prod	-0.49
m-sector 9: Importers of matalic products	-0.42
m-sector 10: Importers of other manufact	-0.27
m-sector 11: Importers of utilities	-0.15
m-sector 14: Importers of trans and telecom	0.00
m-sector 15: Importers of services	0.00
m-sector 16: Importers of others	-0.04
HH1: Poorest decile	-11.48
HH2: Second poorest decile	-11.62
HH3: Third poorest decile	-11.91
HH4: Fourth poorest decile	-11.84
HH5: Lowest middle decile	-11.69
HH6: Lower middle decile	-11.87
HH7: Higher middle decile	-11.46
HH8: Highest middle decile	-11.57
HH9: Second richest decile	-11.11
HH10: Richest decile	-9.34
ENT: Institutions	-6.43
GOV: Government	-4.54
MARGIN: Transaction costs	-17.79
TAX: Taxation	-4.54
GDP Growth	-7.63
Inflation	-7.57

Source: Simulation using KS-CGE model Type IV in Matlab.

The increase of government funding around 7.89% will not be able to boost up the economy of the RPF to level off the negative effect. The RPF will still suffer from the recession around 11% together with other sectors. Agricultural sector (sector 1) will still fall around 9% and food manufacturing sector will still under recession of around 15%.

The results of scenario 12, production cost of sector 3 (food manufacturing) increases by 10% and find the government funding to RPF that would neutralize the negative impact will be presented in the following table.

Table 12: Scenario 12: Production cost of sector 3 (food manufacturing) increases by 10% and the study will find the government funding to RPF that would neutralize the negative impact.

Sector	Results
Sector 1: Agriculture	-9.08
Sector 2: Mining and quarrying	-9.33
Sector 3: Food manufacturing	-14.83
Sector 4: Textile industry	-17.22
Sector 5: Saw mills and food products	-12.98
Sector 6: Paper industries and printing	-8.87
Sector 7: Rubber, chem & petroleum indust	-7.55
Sector 8: Non-metallic products	-8.14
Sector 9: Metal, metal prod & indust	-14.76
Sector 10: Other manufacturing	-19.76
Sector 11: Public utilities	-9.13
Sec 12: Construction+ Sec16: Others	-34.38
Sector 13: Trade	-17.53
Sector 14: Transport and communication	-18.28
Sector 15: Services	-11.27
Sector 17: Royal Project Foundation	0.00
m-sector 1: Importers of agriculture	-0.15
m-sector 2: Importers of mining	-2.37
m-sector 3: Importers of food manufact	-0.63
m-sector 4: Importers of textiles	-0.25
m-sector 5: Importers of wood products	-0.30
m-sector 6: Importers of paper	-0.34
m-sector 7: Importers of rubb, chem, petro	-0.36
m-sector 8: Importers of non-metalic prod	-0.48
m-sector 9: Importers of matalic products	-0.42
m-sector 10: Importers of other manufact	-0.27
m-sector 11: Importers of utilities	-0.15
m-sector 14: Importers of trans and telecom	0.00
m-sector 15: Importers of services	0.00
m-sector 16: Importers of others	-0.04
HH1: Poorest decile	-11.46
HH2: Second poorest decile	-11.61
HH3: Third poorest decile	-11.90

Sector	Results
HH4: Fourth poorest decile	-11.82
HH5: Lowest middle decile	-11.67
HH6: Lower middle decile	-11.85
HH7: Higher middle decile	-11.44
HH8: Highest middle decile	-11.55
HH9: Second richest decile	-11.09
HH10: Richest decile	-9.33
ENT: Institutions	-6.42
GOV: Government	-4.53
MARGIN: Transaction costs	-17.76
TAX: Taxation	-4.53
GDP Growth	-7.62
Inflation	-7.57

Source: Simulation using KS-CGE model Type IV in Matlab.

When the intermediate costs from food manufacturing sector (sector 3) rises 10% and the government raises the funding to the RPF by 45.15%, the results show that it will help to neutralize the economy of the RPF. However, the RPF will be the only sector that benefits from the increasing government funding. Agricultural sector (sector 1) and food manufacturing sector (sector 3) will still be in the recession of around 9% and 15% respectively.

The results of scenario 13, production cost of sector1 (agriculture) and sector 3 (food manufacturing) increase by 10% will be presented in the following table.

Table 13: Scenario 13: Production cost of sector1 (agriculture) and sector 3 (food manufacturing) increase by 10% at the same time.

Sector	Results
Sector 1: Agriculture	-20.42
Sector 2: Mining and quarrying	-20.89
Sector 3: Food manufacturing	-33.24
Sector 4: Textile industry	-38.57
Sector 5: Saw mills and food products	-29.07
Sector 6: Paper industries and printing	-19.86
Sector 7: Rubber, chem & petroleum indust	-16.92
Sector 8: Non-metallic products	-18.22
Sector 9: Metal, metal prod & indust	-33.06
Sector 10: Other manufacturing	-44.24
Sector 11: Public utilities	-20.44
Sec 12: Construction+ Sec16: Others	-77.08
Sector 13: Trade	-39.30
Sector 14: Transport and communication	-40.92
Sector 15: Services	-25.25
Sector 17: Royal Project Foundation	-29.69
m-sector 1: Importers of agriculture	-0.33

Sector	Results
m-sector 2: Importers of mining	-5.32
m-sector 3: Importers of food manufact	-1.42
m-sector 4: Importers of textiles	-0.55
m-sector 5: Importers of wood products	-0.67
m-sector 6: Importers of paper	-0.76
m-sector 7: Importers of rubb, chem, petro	-0.81
m-sector 8: Importers of non-metalic prod	-1.09
m-sector 9: Importers of matalic products	-0.94
m-sector 10: Importers of other manufact	-0.61
m-sector 11: Importers of utilities	-0.33
m-sector 14: Importers of trans and telecom	0.00
m-sector 15: Importers of services	0.00
m-sector 16: Importers of others	-0.09
HH1: Poorest decile	-25.68
HH2: Second poorest decile	-26.01
HH3: Third poorest decile	-26.66
HH4: Fourth poorest decile	-26.50
HH5: Lowest middle decile	-26.16
HH6: Lower middle decile	-26.55
HH7: Higher middle decile	-25.64
HH8: Highest middle decile	-25.89
HH9: Second richest decile	-24.86
HH10: Richest decile	-20.90
ENT: Institutions	-14.38
GOV: Government	-10.16
MARGIN: Transaction costs	-39.80
TAX: Taxation	-10.16
GDP Growth	-17.07
Inflation	-16.91

Source: Simulation using KS-CGE model Type IV in Matlab.

The effects of the both the rising of intermediate costs in agricultural sector (sector 1) and food manufacturing sector (sector 3) by 10% will be enormous. The RPF's economy will be under severe recession by the drop of around 30%. The similar effect will occur to both agricultural and food manufacturing sector too. Their economies will fall around 20% and 33% respectively. All household decile will be badly affected with around 20% to 27% of the shrinkage of their income. The tax and government budget will be reduced by 10%. GDP growth will be minus 17% at the same time that deflation of around 17% occur in the Thai economy.

The results of scenario 14, production cost of sector 1: agricultural and sector 3: food manufacturing increase by 10% and increase Government funding by 7.89% will be presented in the following table.

Table 14: Scenario 14: Production cost of sector 1 (agriculture) and sector 3 (food manufacture) increase by 10% and government funding increases by 7.89%.

Sector	Results
Sector 1: Agriculture	-20.41
Sector 2: Mining and quarrying	-20.89
Sector 3: Food manufacturing	-33.23
Sector 4: Textile industry	-38.56
Sector 5: Saw mills and food products	-29.07
Sector 6: Paper industries and printing	-19.86
Sector 7: Rubber, chem & petroleum indust	-16.92
Sector 8: Non-metallic products	-18.22
Sector 9: Metal, metal prod & indust	-33.06
Sector 10: Other manufacturing	-44.23
Sector 11: Public utilities	-20.43
Sec 12: Construction+ Sec16: Others	-77.07
Sector 13: Trade	-39.30
Sector 14: Transport and communication	-40.92
Sector 15: Services	-25.25
Sector 17: Royal Project Foundation	-27.79
m-sector 1: Importers of agriculture	-0.33
m-sector 2: Importers of mining	-5.32
m-sector 3: Importers of food manufact	-1.42
m-sector 4: Importers of textiles	-0.55
m-sector 5: Importers of wood products	-0.67
m-sector 6: Importers of paper	-0.76
m-sector 7: Importers of rubb, chem, petro	-0.81
m-sector 8: Importers of non-metalic prod	-1.09
m-sector 9: Importers of matalic products	-0.94
m-sector 10: Importers of other manufact	-0.61
m-sector 11: Importers of utilities	-0.33
m-sector 14: Importers of trans and telecom	0.00
m-sector 15: Importers of services	0.00
m-sector 16: Importers of others	-0.09
HH1: Poorest decile	-25.67
HH2: Second poorest decile	-26.01
HH3: Third poorest decile	-26.65
HH4: Fourth poorest decile	-26.49
HH5: Lowest middle decile	-26.16
HH6: Lower middle decile	-26.55
HH7: Higher middle decile	-25.64
HH8: Highest middle decile	-25.89
HH9: Second richest decile	-24.86
HH10: Richest decile	-20.90
ENT: Institutions	-14.38
GOV: Government	-10.16
MARGIN: Transaction costs	-39.80

Sector	Results
TAX: Taxation	-10.16
GDP Growth	-17.07
Inflation	-16.91

Source: Simulation using KS-CGE model Type IV in Matlab.

The results show that the increasing government funding of 7.89% cannot help the Royal Project Foundation to restore its economy. The RPF will fall around 28% while agricultural sector (sector 1) and food manufacturing sector (sector 3) will also fall around 20% and 33% respectively.

The results of scenario 15, production cost of sector 1 (agriculture) and sector 3 (food manufacturing) increase by 10% and find the government funding that would neutralize the negative impact will be presented in the following table.

Table 15: Scenario 15: Production cost of sector 1 (agriculture) and sector 3 (food manufacture) increase by 10% and the study will find the government funding that would neutralize the negative impact.

Sector	Results
Sector 1: Agriculture	-20.38
Sector 2: Mining and quarrying	-20.85
Sector 3: Food manufacturing	-33.17
Sector 4: Textile industry	-38.49
Sector 5: Saw mills and food products	-29.02
Sector 6: Paper industries and printing	-19.83
Sector 7: Rubber, chem & petroleum indust	-16.89
Sector 8: Non-metallic products	-18.18
Sector 9: Metal, metal prod & indust	-33.00
Sector 10: Other manufacturing	-44.15
Sector 11: Public utilities	-20.40
Sec 12: Construction+ Sec16: Others	-76.93
Sector 13: Trade	-39.21
Sector 14: Transport and communication	-40.84
Sector 15: Services	-25.20
Sector 17: Royal Project Foundation	0.00
m-sector 1: Importers of agriculture	-0.33
m-sector 2: Importers of mining	-5.31
m-sector 3: Importers of food manufact	-1.41
m-sector 4: Importers of textiles	-0.55
m-sector 5: Importers of wood products	-0.67
m-sector 6: Importers of paper	-0.76
m-sector 7: Importers of rubb, chem, petro	-0.81
m-sector 8: Importers of non-metalic prod	-1.08
m-sector 9: Importers of matalic products	-0.93
m-sector 10: Importers of other manufact	-0.61
m-sector 11: Importers of utilities	-0.33

Sector	Results
m-sector 14: Importers of trans and telecom	0.00
m-sector 15: Importers of services	0.00
m-sector 16: Importers of others	-0.09
HH1: Poorest decile	-25.63
HH2: Second poorest decile	-25.96
HH3: Third poorest decile	-26.61
HH4: Fourth poorest decile	-26.45
HH5: Lowest middle decile	-26.11
HH6: Lower middle decile	-26.50
HH7: Higher middle decile	-25.59
HH8: Highest middle decile	-25.84
HH9: Second richest decile	-24.81
HH10: Richest decile	-20.86
ENT: Institutions	-14.35
GOV: Government	-10.13
MARGIN: Transaction costs	-39.71
TAX: Taxation	-10.13
GDP Growth	-17.04
Inflation	-16.91

Source: Simulation using KS-CGE model Type IV in Matlab.

The government needs to increase supporting fund to the Royal Project Foundation by 122.5% to neutralize the negative impact from the rising production cost of food manufacturing sector. It should be noticed that the increasing government funding will help just for the RPF sector. Other sectors such as agriculture (sector 1) and food manufacturing (sector 3) will still under recession due to their increasing prices.

4. Conclusions

This study uses Computable General Equilibrium model (CGE) to analyst the impact of the Royal Project Foundation (RPF) on the nationwide economy of Thailand. It uses the national Social Accounting Matrix (SAM) of Thailand provided by NESDB in 2010 as the database.

Scenarios in this analysis include the expansionary government subsidy into the RPF sector, increase of the sales of RPF products to external markets, increase of sales to households, rising labor cost, rising production costs, and the compensation from the government to neutralize the negative impacts caused by the rising labor cost.

The analysis yields major conclusions as follows:

1. An increasing of government funding to the RPF by 10% will boost up the economy of RPF by 3.36%. The overall economy will grow around 0.004%.
2. Increasing exports of RPF products will lead to the slower growth of the RPF than in a case of stable demand. This is because supply of the RPF products in domestic

- market will be reduced thus their prices will be increased and lead to less consumption.
3. Domestic sales are preferable to exports. This is because supply of RPF products will still be in domestic market. Their prices will increase a little bit due to the demand-driven effect.
 4. Increasing labor cost of 10% will reduce the economy of the RPF by 6.5%. The increase of the labor cost by 19.52% which reflects the Raising Income Policy of the government will drop the RPF's economy by 11.3%. In the latter case, the overall GDP growth will fall around 6.5%.
 5. The increasing government funding by 7.89% which reflects the realistic increasing funding in the following year cannot compensate the negative effect of the increasing labor cost by 19.52% on the RPF. The sector will still drop around 9%.
 6. The sufficient increase of the government funding to the RPF is 37.80% in the case of increasing labor cost by 19.52%. It is equal to around THB143 million. This huge amount is because the rising labor cost affects not only the RPF but also all production sectors which in turns sell their products to the RPF as intermediate inputs.
 7. Agricultural cost is very crucial to the RPF. Its effect is more severe than the effect of increasing labor cost. A 10% increase of the cost will lead to the fall of the RPF's economy by 20%. This huge amount is because agricultural costs affect other production sectors and especially the living cost which in turn affect the labor cost.
 8. The increasing of government funding by 7.89% is apparently not enough for the compensation of the increasing agricultural cost by 10%. The RPF will suffer from the recession of around 18%.
 9. The Government needs to increase the funding to the RPF by 73% to neutralize the negative impact from the rising intermediate costs of agricultural sector by 10%. This is almost double of the funding that it needs to mitigate the effect of the increasing labor cost.
 10. The increasing cost in food manufacturing by 10% will shrink the economy of the RPF by 13.3%. The effect is slightly less than that of the increasing cost in agricultural sector but around double when compared to the effect of the increasing labor cost.
 11. The RPF will still suffer of the drop of its economy around 11% after receiving the increasing government funding of 19.52%.
 12. It needs around 45.5% of the increasing government funding to neutralize the negative effect of the increasing cost in food manufacturing by 10%. This rate lies between the rates that are necessary for the compensation for the increasing labor cost and agricultural cost.
 13. When both agricultural cost and food manufacturing cost rise 10% at the same time, the RPF's economy will drop around 30%. The effect is more server than in case of single rising in either agricultural cost or food manufacturing cost.
 14. The rising government funding of 7.89% will not be able to compensate the negative effect of the increasing costs of both agriculture and food manufacturing by 10%. The foundation's economy will still fall around 28%.
 15. The amount of government funding must rise at least 1.23 times of the previous amount to neutralize the negative effect of the rising costs of both agriculture and food manufacturing by 10%.

In conclusion, the RPF relies heavily on the increasing government funding. However, the funding seems not enough for many situations that negatively affect the economy of the RPF. The most severe case is the rising of both agricultural and food manufacturing costs. Between them, the rising agricultural cost is much more severe than the rising food manufacturing cost. The increasing labor cost is also critical to the economy of the RPF but its effect is less than those of the increasing agricultural and food manufacturing cost. Therefore, the government should not only focus on the direct assist to the RPF by its expansionary funding but also the indirect supports by monitoring and somehow controlling the costs in agricultural, food manufacturing sectors and labor cost to gradually increase rather than letting them increase sharply without any prior warning signal or even attempting to issue some policies to radically increase these costs.

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