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CGE modeling of the impact of skilled labor movements in ASEAN Economic Community focusing on telecommunication industry

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Abstract

This paper investigates the impact of skilled labor movements in ASEAN Economic Community (AEC) on nationwide economy of Thailand using Computable General Equilibrium model. The paper mainly focuses on the labor movement in telecommunication industry. The model consists of three steps. First, it simulates the impact of raising minimum wage to THB300 and raising salary of bachelor graduates to THB15,000 across-the-board and over the country according to the Raising Income Policy (RIP) of the Thai government. Second, it figures out the impact of the skilled labor movement in telecommunication sector among AEC member countries. Last, it includes the impact of skilled labor movements in 8 occupations that are allowed by the AEC agreement. The results reveal that the RIP causes negative impact to the Thai economy due to the rising costs of production that cannot be compensated by the increasing consumption. Inward skilled labor movement to Thailand in the telecommunication sector leads to the increasing income of engineers and related skilled workers in the country. This yields the positive impact to the economy due to the increasing income of the middle-class people while costs of production do not increase much. The inward skilled labor movements in all 8 occupations will even yield more positive impacts to the Thai economy. However, the positive impacts of the skilled labor movements in AEC cannot compensate the negative impacts of the RIP applied earlier. Therefore, Thailand cannot expect that AEC will boost its economy up to the level before the implementation of RIP.

Keywords: Computable general equilibrium model, telecommunication industry, ASEAN Economic Community, labor movement, wage policy

JEL Classification: C68, L96, F15

1. Introduction

Telecommunication sector and the information and communication technology (ICT) are key drivers that link ASEAN Economic Community (AEC) member countries to work together in a circle of economic integration and lead the AEC toward an advanced technology-oriented region. The movement of skilled labors among AEC is expected to be a major change after 10 countries in ASEAN have settled the agreement on free mobile of labor force in the region of Southeast Asia. The spillover of specialists through ASEAN may bring new ideas and expertise to industries and create values to various economic sectors. It is a hope to boost up the economy of ASEAN due to the exchange of specialization and enhancement of capacity building in host countries.

The emerging of AEC will be in 2015. Before this in 2012, Thailand faced a sharp rise of wage and salary due to the Raising Income Policy (RIP) initiated by the Thai government. The government raised the basic wage around 39.50 per cent by the end of 2012 and set an agenda to raise it to THB300 across-the-board and over the country by the end of 2015. Moreover, the government set the basic salary of bachelor graduates to THB15,000 too. These brought controversies about the impact of the RIP on the Thai economy. They also raise a question whether the AEC will ease the impact of the negative effect of the rising labor cost if any.

This study simulates the impacts of the RIP first. Then it simulates the impacts of skilled labor movements in AEC. Primarily, it aims at the skilled labor movement in telecommunication industry. Later, it includes all 8 occupations that are allowed by the agreement into the movements.

2. Literature review

Chaiwan and Suriya (2013) estimated the impact of the Raising Income Policy (RIP) of the Thai government on employment, food prices and poverty reduction. There are two points that this study have mentioned. First, the impact was negative to households. The real income of households would be falling in spite of the rising nominal income. This is because the wage is the input price. It would raise the cost of production as well as cost of living. Moreover, the employment would be reduced by the shift of labor supply to the left hand side due to the rising wage when labor demand remained constant; thus the equilibrium in the labor market would reveal the less employment. The rising unemployment rate will lessen the household income in nominal term too. Therefore, households would face both the decreasing nominal income and increasing living expenses. It is unavoidable that the real income of households would fall eventually in the long-run.

Second, the RIP was not pro-poor. The raising of minimum wage and based salary turned to harm the poor than the rich. In details, when the minimum wage was raised by 30 percent, the poorest households in the 1st decide lost around 13% of their income in 5 years while the richest households in the 10th decide also lost but around 10% in 5 years which was less than that of the poor. Moreover, when the minimum wage was raised by 30 percent plus the based salary by 10 percent, the poorest households also lost more than the richest by around 25% and 20% in 5 years respectively.

Thailand Development Research Institute (2013) predicted the fall of GDP by 1.7% per year. This number can be eased by increasing labor productivity. However, this hope has not been turned into reality especially in the agricultural sector which is reported by TDRI to be hit the most severely by the RIP. Business transaction costs are estimated to rise around 4%. Moreover, by the flat rate of minimum wage of THB300 per day that would be applied by the end of 2015, the incentives of factory deployments in locations further than 300 kilometers

from Bangkok will be faded. The industrial promotion to remote areas will be failed. Consequently, the RIP raises the minimum wage of Thailand onto the third place in ASEAN following Singapore and the Philippines. Comparing to Vietnam, Cambodia and Lao PDR whose minimum wages are three times lower than that of Thailand, it is risky that the labor-intensive industries such as textile will considering the shift from Thailand to those countries. However, the study of TDRI did not touch the impact of skilled labor movements in AEC.

Previously in 2012, Thailand Development Research Institute (2012) launched an official study of the impact of the implementing the minimum wage and based salary of bachelor graduates and submitted to the National Research Council of Thailand. The report said that the RIP was good especially when the wage and based salary did not match the hiking living expenses. It would benefit around 3.2 million labors in Thailand which accounts around 30% of total labor force in the private sector. It estimated the expansion of around 0.6% per year of the GDP when labor productivity was raised around 8-10%. Moreover, the report mentioned that this was the good stimulus for firms to improve their productivity. However, the literature assumed that the industry would not lay-off the employees and persisted to pay the increasing wage and salary with the investment for the productivity improvement at the same time. This might be curious whether the firms could do that.

The studied also suggested that the government should subsidize the transition from the regime of low labor productivity to the higher one. This suggestion showed that the firms might not be able to pass the transition period by themselves without the helps from the government. Then, it should be curious again whether the government would be strong enough with its budgetary position to help the industries. In the same report, TDRI stated that the government would have to spend a lot more, around THB7,800 million to serve the raising the based salary of bachelor graduates in the first year of the implementation. Moreover, the government would spend more to the retirement fund and on the pension. These climbing spending might lessen the ability to subsidize the firms for their transition period. All in all, it was expected that the government would have many responsibilities to do to solve the negative impacts that might occur from the RIP.

3. Methodology. The study uses KS-CGE model originated by Suriya and Sudtasan (2013) and modifies the model to suit the problem. This type of CGE model was used by some previous works such as Kanjanatarakul and Suriya (2012 and 2013). The modified model is called “KS-Telecom-CGE” due to the addition of telecommunication industry into the Social Accounting Matrix (SAM) which is the database of the CGE model.

The model is based on a system of linear equations. It forms three matrices: $\mathbf{XP}=\mathbf{Y}$. Matrix \mathbf{X} represents the domestic economy, \mathbf{P} represents the endogenous price, and \mathbf{Y} represents the net external income. It solves the system for \mathbf{P} with Gauss-Seidel iteration method. The model applies constant elasticity of substitution (CES) technology. Input ratios change according to the change of price ratios. It applies Shephard’s lemma to calculate optimal \mathbf{X} after the price changes to reflect the structural change of the productions. The routine repeats itself until \mathbf{P} is converged.

The structure of matrix \mathbf{X} consists of the following elements:

- 1) The row of matrix \mathbf{X} presents a sector.
- 2) The diagonal values are positive and present domestic sales of related sectors.
- 3) The off-diagonal values are all negative and present intermediate inputs, factor inputs, tax and payments to institutions.
- 4) Net exports are presented in matrix \mathbf{Y} . There is no element related to imports or exports in matrix \mathbf{X} .

Matrix \mathbf{Y} presents the net external income. It combines exports, imports, remittance, capital inflow and capital outflow in all forms. The value of \mathbf{Y} is negative when it has a surplus of external income. The idea behind $\mathbf{XP}=\mathbf{Y}$ is that the value of domestic sales plus external income equals to all inputs, payments and tax. Business profits are all translated into household income. Then every sector is under zero-profit condition. All markets will be clear when the system can find \mathbf{P} that satisfies this condition.

The KS-CGE model is a simplification of the CGE model of Professor Johannes Broecker of University of Kiel, Germany. The application of his CGE model at the village level can be seen in some works such as Suriya (2010 and 2011).

It should be noted that the results from the KS-Telecom-CGE will be for the next 5 years. This number is from the calibration of the model to the CGE model of Bank of Thailand. Moreover, a major drawback of this model is that it cannot show the stagflation where high inflation comes at the same time of high unemployment. The model tends to show the unemployment and deflation instead. This may concern as the long-run effect instead of the short-run because the deflation may be the result after many years of the adjustment in the economy while stagflation may persist only in the short-run.

The counterfactuals include three parts as follows:

Part 1: Impact of Raising Income Policy (RIP)

The part divides into two sub-issues: First, it shows the impact of increasing wage by 39.50%. The wage will increase the income to the 1st to the 4th deciles of households. Second, it presents the impact of increasing wage and the based salary for bachelor graduates by 29.20%. The salary will increase the income of the 5th to the 8th deciles of households.

The calculation of the shocks is as follows:

- (1) The shock of the wage is 39.50% according to the adjustment by the end of 2012 carried by Ministry of Labor.
- (2) The shock of the salary is calculated from the weighted average of the growth of the salary, and adjusted by the portion of bachelor graduates in labor force of the 5th to the 8th decile of households.

TABLE 1. Weighted average growth of salary of bachelor graduates.

| Category | Organization | Based salary before 2012 (THB) | Based salary by the end of 2012 (THB) | Growth (%) | Portion of bachelor graduates over the country (%) |
|----------|-----------------------------|--------------------------------|---------------------------------------|--------------|--|
| 1 | Private sector | 11,568 | 15,000 | 29.67 | 75.28 |
| 2 | Public sector | 9,140 | 11,680 | 27.79 | 24.72 |
| | Weighted average growth (%) | | | 29.20 | 100.00 |

Source: Own calculation.

TABLE 2. Bachelor graduates workforce.

| Degree | Total (Persons) | Employed (Persons) | Employment ratio (%) |
|-------------------------------------|-----------------|--------------------|---------------------------|
| Higher education including bachelor | 5,148,284 | 4,238,500 | 82.33 |
| Bachelor | 4,434,572 | 3,650,912* | See note below the table. |

Source: Calculation using data from National Statistics Office in 2010.

Note: *Calculated using 82.33 % of the whole employment of the graduates with higher education.

TABLE 3. Bachelor graduates workforce in the 5th – 8th deciles of households.

| Degree | Employed workforce (Persons) | Workforce in the 5 th -8 th decides (Persons) | Portion in the workforce of the 5 th – 8 th decides of households (%) |
|-------------------------------------|------------------------------|---|---|
| Higher education including bachelor | 4,238,500 | 2,825,667 | 18.28 |
| Bachelor | 3,650,912 | 2,433,941 | 15.75 |
| Labor force with all degree | 38,643,480 | 15,457,392* | 100.00 |

Source: Calculation using data from National Statistics Office in 2010.

Note: *Calculated by 40% of total labor force with all degree. By assumptions, all workforces with higher education stay in the 5th to 10th deciles of households. Therefore, the 5th – 8th deciles occupy 66.67% of the workforce with higher education.

TABLE 4. The shock of salary of bachelor graduates into the KS-Telecom-CGE model.

| Degree | Weighted average growth of salary* (%) | Portion in the workforce of the 5 th – 8 th decides of households** (%) | The shock of salary in the KS-CGE model*** (Times) |
|----------|--|---|---|
| Bachelor | 29.20 | 15.75 | $(1.2920 \times 0.1575) + (1 \times 0.8425) = 1.0406$ |

Source: Own calculation.

Note: * From table 1.

** From table 3.

*** This is under an assumption the RIP raises only the salary of bachelor graduates and does not affect salary of other graduates with the higher degrees. Moreover, it is assumed that there are no workforce who receive minimum wage of THB300 in the 5th to 8th deciles of households. Other workforces who get the degree below bachelor degree earn their salaries above the minimum wage but less than those of bachelor graduates.

Part 2: Impact of skilled labor movement in telecommunications sector

This part investigates the impact of increasing salary only in the telecommunication sector. It thinks that the skilled labor movement in the sector will boost up the salary level of the whole sector. This is because of four reasons.

First, engineers who move from other countries to Thailand must get higher salary than in the country of origin otherwise they better stay in their countries. Second, the gap between salary of external and local engineers will encourage the local ones to ask for higher salary. This is possible when the labor conversion factor in the industry is 1.33 in Thailand according to the International Labor Office in 2013. It means that the salary of engineers in telecommunication sector in Thailand is underpaid; the fair salary should be 33 per cent higher. Third, local engineers may improve themselves to match external engineers and then deserves the higher salary. Four, the industry may raise the salary for local engineers to prevent them to work in other AEC countries.

The study will increase the salary in the telecommunications sector by 5% to 50%. It will increase the income of the 5th to the 8th deciles of households. The calculation of the shocks is as follows:

TABLE 4. The shock of salary after the movement of skilled labor into Telecommunication sector***

| Sector | Salary growth* (%) | Portion of workforce with higher education in the workforce of the 5 th – 8 th deciles of households** (%) | The shock of salary in the KS-CGE model (Times) |
|-------------------------------|--------------------|--|--|
| Sector 16: Telecommunications | g | 18.28 | Shock= $([1+(g/100)] \times 0.1828) + (1 \times 0.8172)$ |

Source: Own calculation.

Note: * Variation from 5% to 50%.

** From table 3. The reason why the shock is limited to the 5th-8th deciles of households because it assumes that the skilled labors are in the middle-class and work to earn from salary. The 9th and 10th deciles are reserved to entrepreneurs and their families who earn mainly from profit. Even though they may get university degrees but they do not work to earn from salary but profit instead.

*** The movement of skilled labor in AEC is not limited to only bachelor graduates but also cover all graduates with higher education.

Part 3: Impact of skilled labor movement in 8 occupations allowed by AEC

The study also finds the impact of the skilled labor movement in all 8 occupations which are allowed by the AEC agreement. They are engineers, surveyors, architects, medical services (doctors, nurses and dentists), accountants and tourism services. The ideas of the rising income of these 8 occupations follow the reasons described earlier.

The counterfactual is to increase the salary of the 8 occupations by 5% to 50%. The calculation of the shocks is as follows:

TABLE 5. The shock of salary after the movement of skilled labor into Thailand in 8 occupations****

| Sector | Salary growth* (%) | Occupations and portion of salary of these occupations in total salary of the sector** | The shock of salary in the KS-CGE model*** (Times) |
|---|--------------------|--|--|
| Sector 2: Mining and quarrying | G_2 | Occupation 1: surveyor Ratio surveyor = 0.5501 Growth rate of salary of surveyor = h_1 Occupation 2: engineer Ratio engineer = 0.4207 Growth rate of salary of surveyor = h_2 | $G_2 = ([1+(h_1/100)] \times \text{Ratio surveyor}) + ([1+(h_2/100)] \times \text{Ratio engineer}) + (1 \times [1 - \text{Ratio surveyor} - \text{Ratio engineer}])$ Shock= $([1+(G_2/100)] \times 0.1828) + (1 \times 0.8172)$ |
| Sector 7: Rubber, chemical and petroleum industries | G_7 | Occupation 1: surveyor Ratio surveyor = 0.6819 Growth rate of salary of surveyor = h_1 | $G_7 = ([1+(h_1/100)] \times \text{Ratio surveyor}) + (1 \times [1 - \text{Ratio surveyor}])$ Shock= $([1+(G_7/100)] \times 0.1828) + (1 \times 0.8172)$ |
| Sector 9: Metal, metal products and industries | G_9 | Occupation 1: surveyor Ratio surveyor = 0.0068 Growth rate of salary of surveyor = h_1 Occupation 2: engineer Ratio engineer = 0.8118 Growth rate of salary of surveyor = h_2 | $G_9 = ([1+(h_1/100)] \times \text{Ratio surveyor}) + ([1+(h_2/100)] \times \text{Ratio engineer}) + (1 \times [1 - \text{Ratio surveyor} - \text{Ratio engineer}])$ Shock= $([1+(G_9/100)] \times 0.1828) + (1 \times 0.8172)$ |

| Sector | Salary growth* (%) | Occupations and portion of salary of these occupations in total salary of the sector** | The shock of salary in the KS-CGE model*** (Times) |
|---|--------------------|---|--|
| Sector 11: Public utilities | G_{11} | Occupation 2: engineer Ratio engineer = 0.8717 Growth rate of salary of surveyor = h_2 | $G_{11} = ([1 + (h_2/100)] \times \text{Ratio engineer}) + (1 \times [1 - \text{Ratio engineer}])$ Shock = $([1 + (G_{11}/100)] \times 0.1828) + (1 \times 0.8172)$ |
| Sector 12: Construction and others | G_{12} | Occupation 1: surveyor Ratio surveyor = 0.1184 Growth rate of salary of surveyor = h_1 Occupation 2: engineer Ratio engineer = 0.6782 Growth rate of salary of surveyor = h_2 Occupation 3: architect Ratio architect = 0.1716 Growth rate of salary of architect = h_3 | $G_{12} = ([1 + (h_1/100)] \times \text{Ratio surveyor}) + ([1 + (h_2/100)] \times \text{Ratio engineer}) + ([1 + (h_3/100)] \times \text{Ratio architect}) + (1 \times [1 - \text{Ratio surveyor} - \text{Ratio engineer} - \text{Ratio architect}])$ Shock = $([1 + (G_{12}/100)] \times 0.1828) + (1 \times 0.8172)$ |
| Sector 14: Transportation and communication | G_{14} | Occupation 2: engineer Ratio engineer = 0.7202 Growth rate of salary of surveyor = h_2 | $G_{14} = ([1 + (h_2/100)] \times \text{Ratio engineer}) + (1 \times [1 - \text{Ratio engineer}])$ Shock = $([1 + (G_{14}/100)] \times 0.1828) + (1 \times 0.8172)$ |
| Sector 15: Services | G_{15} | Occupation 4: Accountant Ratio accountant = 0.1197 Growth rate of salary of surveyor = h_4 Occupation 5, 6, 7: Medical service (Doctor, dentist and nurse) Ratio medical service = 0.0803 Growth rate of salary of surveyor = $h_{5,6,7}$ Occupation 8: Tourism service Ratio tourism service = 0.0821 Growth rate of salary of architect = h_8 | $G_{15} = ([1 + (h_4/100)] \times \text{Ratio accountant}) + ([1 + (h_{5,6,7}/100)] \times \text{Ratio medical service}) + ([1 + (h_8/100)] \times \text{Ratio tourism service}) + (1 \times [1 - \text{Ratio accountant} - \text{Ratio medical service} - \text{Ratio tourism service}])$ Shock = $([1 + (G_{15}/100)] \times 0.1828) + (1 \times 0.8172)$ |

Source: Own calculation.

Note: * Variation from 5% to 50%.

** Accountants are able to get involved in many sectors but the specialists may work just in only in accounting service companies or financial service companies that are included in sector 15 (services).

*** The number 0.1828 is the portion of workforce with higher education in the workforce of the 5th – 8th deciles of households derived from table 3. The reason why the shock is limited to the 5th-8th deciles of households because it assumes that the skilled labors are in the middle-class and work to earn from salary. The 9th and 10th deciles are reserved to entrepreneurs and their families who earn mainly from profit. Even though they may get university degrees but they do not work to earn from salary but profit instead.

**** The movement of skilled labor in AEC is not limited to only bachelor graduates but also cover all graduates with higher education.

4. Data

The study uses the data from the Social Accounting Matrix (SAM) of Thailand released by NESBD in 2010 originally in the dimension of 180×180 sectors. It reduces the dimension into 16×16 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: Trades
- Sector 14: Transportation and communication
- Sector 15: Services
- Sector 16: Telecommunications

5. Results

5.1 Raising the minimum wage by 39.50%

The raising of the minimum wage by 39.50% obviously causes the economy down. In 5 years, GDP will fall around 10.84% or around 2.17% per year (Table 6). The real income will also fall due to the higher rate of decreasing income over the deflation. Sectors that are struck the most include Construction and others (-49.93%), Transportation and communication (-28.33%), Other manufacturing (-28.05%), Trades (-24.99%) and Textile industry (-24.56%). This results reveal the labor-intensive structure of those sectors. For households, the most affected households are in the 3rd and 4th deciles, -17.31% and -17.21% respectively. The poor suffer than the rich comparing the effect on the 1st decile and the 10th decile as -16.68% and -13.24%. The richest household also suffer less than the 2nd richest household comparing the income growth of -13.24% and -15.85% respectively. Tax and government expenditure will be reduced by 6.39%. Transactions in the economy, represented by the Margin, will fall around 26%.

Table 6: Impact of the raising of wage by 39.50%.

| | Sector | Total effect | Growth in 5 years (%) |
|---------|-------------------------------|--------------|--------------------------|
| Sector1 | Agriculture | 0.8707 | -12.93 |
| Sector2 | Mining and quarrying | 0.8668 | -13.32 |
| Sector3 | Food manufacturing | 0.7885 | -21.15 |
| Sector4 | Textile industry | 0.7544 | -24.56 |
| Sector5 | Saw mills and food products | 0.8151 | -18.49 |
| Sector6 | Paper industries and printing | 0.8737 | -12.63 |

| | Sector | Total effect | Growth in 5 years (%) |
|-------------|---|--------------|--------------------------|
| Sector7 | Rubber, chemical and petroleum industries | 0.8922 | -10.78 |
| Sector8 | Non-metallic products | 0.8844 | -11.56 |
| Sector9 | Metal, metal products and industries | 0.7897 | -21.03 |
| Sector10 | Other manufacturing | 0.7195 | -28.05 |
| Sector11 | Public utilities | 0.8701 | -12.99 |
| Sector12 | Construction and others | 0.5007 | -49.93 |
| Sector13 | Trades | 0.7501 | -24.99 |
| Sector14 | Transportation and communication | 0.7167 | -28.33 |
| Sector15 | Services | 0.8411 | -15.89 |
| Sector16 | Telecommunications | 0.8257 | -17.43 |
| Importer1 | Agriculture | 0.9979 | -0.21 |
| Importer2 | Mining and quarrying | 0.9666 | -3.34 |
| Importer3 | Food manufacturing | 0.9911 | -0.89 |
| Importer4 | Textile industry | 0.9965 | -0.35 |
| Importer5 | Saw mills and food products | 0.9958 | -0.42 |
| Importer6 | Paper industries and printing | 0.9952 | -0.48 |
| Importer7 | Rubber, chemical and petroleum industries | 0.9949 | -0.51 |
| Importer8 | Non-metallic products | 0.9932 | -0.68 |
| Importer9 | Metal, metal products and industries | 0.9941 | -0.59 |
| Importer10 | Other manufacturing | 0.9962 | -0.38 |
| Importer11 | Public utilities | 0.9979 | -0.21 |
| Importer12 | Transportation and communication | 1.0000 | 0.00 |
| Importer13 | Services | 1.0000 | 0.00 |
| Importer14 | Telecommunications | 0.9994 | -0.06 |
| HH1 | 1st decile of households | 0.8332 | -16.68 |
| HH2 | 2nd decile of households | 0.8312 | -16.88 |
| HH3 | 3rd decile of households | 0.8269 | -17.31 |
| HH4 | 4th decile of households | 0.8279 | -17.21 |
| HH5 | 5th decile of households | 0.8331 | -16.69 |
| HH6 | 6th decile of households | 0.8305 | -16.95 |
| HH7 | 7th decile of households | 0.8363 | -16.37 |
| HH8 | 8th decile of households | 0.8348 | -16.52 |
| HH9 | 9th decile of households | 0.8415 | -15.85 |
| HH10 | 10th decile of households | 0.8676 | -13.24 |
| Institution | Institution | 0.9092 | -9.08 |
| Government | Government | 0.9361 | -6.39 |
| Margin | Margin | 0.7399 | -26.01 |
| Tax | Tax | 0.9361 | -6.39 |
| GDP growth | GDP growth | 0.8916 | -10.84 |
| Inflation | Inflation | 0.8928 | -10.72 |

Source: Calculation using KS-Telecom-CGE.

5.2 Raising the based salary for bachelor graduates by 29.20%

The raising of the based salary for bachelor graduate by 29.20% by itself does not harm much to the Thai economy. GDP will fall approximately 4.15% in 5 years or around less than 1 percent per year (Table 7). Real income also falls due to the GDP recession is larger than the deflation. Construction and others, Transportation and communication, and other manufacturing are among the sectors that are negatively affected by the policy. The 6th and 3rd deciles of households are the most affected group of people. The rich still suffer less than the poor. Tax and government expenditure drop around 2.45%. Transactions fall around 10%.

Table 7: Impact of the raising of based salary of bachelor graduates by 29.20%.

| | Sector | Total effect | Growth in 5 years (%) |
|------------|---|--------------|--------------------------|
| Sector1 | Agriculture | 0.9505 | -4.95 |
| Sector2 | Mining and quarrying | 0.9490 | -5.10 |
| Sector3 | Food manufacturing | 0.9190 | -8.10 |
| Sector4 | Textile industry | 0.9060 | -9.40 |
| Sector5 | Saw mills and food products | 0.9292 | -7.08 |
| Sector6 | Paper industries and printing | 0.9516 | -4.84 |
| Sector7 | Rubber, chemical and petroleum industries | 0.9587 | -4.13 |
| Sector8 | Non-metallic products | 0.9557 | -4.43 |
| Sector9 | Metal, metal products and industries | 0.9195 | -8.05 |
| Sector10 | Other manufacturing | 0.8926 | -10.74 |
| Sector11 | Public utilities | 0.9503 | -4.97 |
| Sector12 | Construction and others | 0.8089 | -19.11 |
| Sector13 | Trades | 0.9043 | -9.57 |
| Sector14 | Transportation and communication | 0.8915 | -10.85 |
| Sector15 | Services | 0.9391 | -6.09 |
| Sector16 | Telecommunications | 0.9333 | -6.67 |
| Importer1 | Agriculture | 0.9992 | -0.08 |
| Importer2 | Mining and quarrying | 0.9872 | -1.28 |
| Importer3 | Food manufacturing | 0.9966 | -0.34 |
| Importer4 | Textile industry | 0.9987 | -0.13 |
| Importer5 | Saw mills and food products | 0.9984 | -0.16 |
| Importer6 | Paper industries and printing | 0.9982 | -0.18 |
| Importer7 | Rubber, chemical and petroleum industries | 0.9980 | -0.20 |
| Importer8 | Non-metallic products | 0.9974 | -0.26 |
| Importer9 | Metal, metal products and industries | 0.9977 | -0.23 |
| Importer10 | Other manufacturing | 0.9985 | -0.15 |
| Importer11 | Public utilities | 0.9992 | -0.08 |
| Importer12 | Transportation and communication | 1.0000 | 0.00 |
| Importer13 | Services | 1.0000 | 0.00 |
| Importer14 | Telecommunications | 0.9998 | -0.02 |
| HH1 | 1st decile of households | 0.9373 | -6.27 |
| HH2 | 2nd decile of households | 0.9365 | -6.35 |

| | Sector | Total effect | Growth in 5 years (%) |
|-------------|---------------------------|--------------|--------------------------|
| HH3 | 3rd decile of households | 0.9349 | -6.51 |
| HH4 | 4th decile of households | 0.9353 | -6.47 |
| HH5 | 5th decile of households | 0.9357 | -6.43 |
| HH6 | 6th decile of households | 0.9347 | -6.53 |
| HH7 | 7th decile of households | 0.9369 | -6.31 |
| HH8 | 8th decile of households | 0.9363 | -6.37 |
| HH9 | 9th decile of households | 0.9393 | -6.07 |
| HH10 | 10th decile of households | 0.9493 | -5.07 |
| Institution | Institution | 0.9653 | -3.47 |
| Government | Government | 0.9755 | -2.45 |
| Margin | Margin | 0.9004 | -9.96 |
| Tax | Tax | 0.9755 | -2.45 |
| GDP growth | GDP growth | 0.9585 | -4.15 |
| Inflation | Inflation | 0.9588 | -4.12 |

Source: Calculation using KS-Telecom-CGE

5.3 Raising of minimum wage by 39.50% and based salary for bachelor graduates by 29.20%

The combined impact of the raising of the minimum wage by 39.50% and based salary for bachelor graduates by 29.20% will pool down the economy by 14.34% in 5 years or around 2.87% per year (Table 8). The real income also drops. Construction and others suffer the most, around 66% in 5 years which mean more than half of the sector will disappear from the Thai economy if there are no other policies to cure these negative impacts. More than one-third of Other manufacturing, Transportation and communication, and Trades will also fade out from the economy unless the government subsidize the firms to boost labor productivity according to the suggestion made by TDRI (2012 and 2013). Most of households suffer from the RIP quite similarly. The 2nd until 6th deciles of households suffer around 22%. The rich suffer less than the poor in all cases and the richest decile suffer less than the second richest too. Tax and government expenditure fall around 8.45% in 5 years or around 1.69% per year. Transactions in the economy will fade out around one-third of the present ground.

Table 8: Impact of the raising of minimum wage by 39.50% and based salary of bachelor graduates by 29.20%.

| | Sector | Total effect | Growth in 5 years (%) |
|---------|---|--------------|--------------------------|
| Sector1 | Agriculture | 0.8289 | -17.11 |
| Sector2 | Mining and quarrying | 0.8238 | -17.62 |
| Sector3 | Food manufacturing | 0.7203 | -27.97 |
| Sector4 | Textile industry | 0.6751 | -32.49 |
| Sector5 | Saw mills and food products | 0.7554 | -24.46 |
| Sector6 | Paper industries and printing | 0.8329 | -16.71 |
| Sector7 | Rubber, chemical and petroleum industries | 0.8574 | -14.26 |
| Sector8 | Non-metallic products | 0.8471 | -15.29 |

| | Sector | Total effect | Growth in 5 years (%) |
|-------------|---|--------------|--------------------------|
| Sector9 | Metal, metal products and industries | 0.7219 | -27.81 |
| Sector10 | Other manufacturing | 0.6289 | -37.11 |
| Sector11 | Public utilities | 0.8282 | -17.18 |
| Sector12 | Construction and others | 0.3393 | -66.07 |
| Sector13 | Trades | 0.6694 | -33.06 |
| Sector14 | Transportation and communication | 0.6252 | -37.48 |
| Sector15 | Services | 0.7898 | -21.02 |
| Sector16 | Telecommunications | 0.7694 | -23.06 |
| Importer1 | Agriculture | 0.9972 | -0.28 |
| Importer2 | Mining and quarrying | 0.9558 | -4.42 |
| Importer3 | Food manufacturing | 0.9882 | -1.18 |
| Importer4 | Textile industry | 0.9954 | -0.46 |
| Importer5 | Saw mills and food products | 0.9944 | -0.56 |
| Importer6 | Paper industries and printing | 0.9937 | -0.63 |
| Importer7 | Rubber, chemical and petroleum industries | 0.9932 | -0.68 |
| Importer8 | Non-metallic products | 0.9910 | -0.90 |
| Importer9 | Metal, metal products and industries | 0.9922 | -0.78 |
| Importer10 | Other manufacturing | 0.9949 | -0.51 |
| Importer11 | Public utilities | 0.9972 | -0.28 |
| Importer12 | Transportation and communication | 1.0000 | 0.00 |
| Importer13 | Services | 1.0000 | 0.00 |
| Importer14 | Telecommunications | 0.9992 | -0.08 |
| HH1 | 1st decile of households | 0.7805 | -21.95 |
| HH2 | 2nd decile of households | 0.7778 | -22.22 |
| HH3 | 3rd decile of households | 0.7721 | -22.79 |
| HH4 | 4th decile of households | 0.7735 | -22.65 |
| HH5 | 5th decile of households | 0.7788 | -22.12 |
| HH6 | 6th decile of households | 0.7754 | -22.46 |
| HH7 | 7th decile of households | 0.7831 | -21.69 |
| HH8 | 8th decile of households | 0.7811 | -21.89 |
| HH9 | 9th decile of households | 0.7903 | -20.97 |
| HH10 | 10th decile of households | 0.8248 | -17.52 |
| Institution | Institution | 0.8799 | -12.01 |
| Government | Government | 0.9155 | -8.45 |
| Margin | Margin | 0.6559 | -34.41 |
| Tax | Tax | 0.9155 | -8.45 |
| GDP growth | GDP growth | 0.8566 | -14.34 |
| Inflation | Inflation | 0.8582 | -14.18 |

Source: Calculation using KS-Telecom-CGE

5.4 Increasing salary in telecommunication industry due to skilled labor movement in AEC

The movement of skilled labor into telecommunications sector in Thailand will raise the salary of the engineers in sector. By the simulation of the increasing salary from 5% to 50%, the study discovers that the movement will boost the economy (Table 9). However, the impacts are so small. GDP growth will be just 0.15% in 5 years at the increasing salary of 50%. It means that impact is around 0.03% per year. The sector that benefits most from this movement is the telecommunications itself. The impact to the sector is also small with just around 1.63% in 5 years or around 0.53% per year. All households benefit from the movement. The poor benefit more than the rich. The richest decile of households benefit less than the second richest. This is a good sign of pro-poor effect in AEC. Tax and government expenditure will rise only around 0.09% in 5 years or less than 0.02% per year. Transactions in the economy will grow around 0.39% in 5 years or around 0.08% per year.

Table 9: Impact of increasing salary in telecommunication industry due to skilled labor movement in AEC.

| | Sector | Growth in 5 years of the total effect due to the change in salary in telecommunication industry (%) | | | | | | | | | |
|-----------|---|--|------|------|------|------|------|------|------|------|------|
| | | 5% | 10% | 15% | 20% | 25% | 30% | 35% | 40% | 45% | 50% |
| Sector1 | Agriculture | 0.02 | 0.03 | 0.05 | 0.06 | 0.08 | 0.09 | 0.11 | 0.12 | 0.14 | 0.16 |
| Sector2 | Mining and quarrying | 0.02 | 0.03 | 0.05 | 0.07 | 0.08 | 0.10 | 0.12 | 0.13 | 0.15 | 0.17 |
| Sector3 | Food manufacturing | 0.03 | 0.05 | 0.08 | 0.11 | 0.13 | 0.16 | 0.18 | 0.21 | 0.24 | 0.26 |
| Sector4 | Textile industry | 0.03 | 0.06 | 0.10 | 0.13 | 0.16 | 0.19 | 0.22 | 0.25 | 0.29 | 0.32 |
| Sector5 | Saw mills and food products | 0.02 | 0.05 | 0.07 | 0.09 | 0.12 | 0.14 | 0.16 | 0.18 | 0.21 | 0.23 |
| Sector6 | Paper industries and printing | 0.02 | 0.03 | 0.05 | 0.06 | 0.08 | 0.09 | 0.11 | 0.12 | 0.14 | 0.15 |
| Sector7 | Rubber, chemical and petroleum industries | 0.01 | 0.03 | 0.04 | 0.06 | 0.07 | 0.09 | 0.10 | 0.12 | 0.13 | 0.14 |
| Sector8 | Non-metallic products | 0.02 | 0.03 | 0.05 | 0.06 | 0.08 | 0.09 | 0.11 | 0.12 | 0.14 | 0.15 |
| Sector9 | Metal, metal products and industries | 0.03 | 0.06 | 0.09 | 0.12 | 0.14 | 0.17 | 0.20 | 0.23 | 0.26 | 0.29 |
| Sector10 | Other manufacturing | 0.04 | 0.08 | 0.11 | 0.15 | 0.19 | 0.23 | 0.27 | 0.31 | 0.34 | 0.38 |
| Sector11 | Public utilities | 0.02 | 0.03 | 0.05 | 0.07 | 0.08 | 0.10 | 0.11 | 0.13 | 0.15 | 0.16 |
| Sector12 | Construction and others | 0.07 | 0.13 | 0.20 | 0.27 | 0.34 | 0.40 | 0.47 | 0.54 | 0.61 | 0.67 |
| Sector13 | Trades | 0.04 | 0.08 | 0.12 | 0.16 | 0.19 | 0.23 | 0.27 | 0.31 | 0.35 | 0.38 |
| Sector14 | Transportation and communication | 0.04 | 0.08 | 0.12 | 0.16 | 0.20 | 0.23 | 0.27 | 0.31 | 0.35 | 0.39 |
| Sector15 | Services | 0.02 | 0.04 | 0.07 | 0.09 | 0.11 | 0.13 | 0.16 | 0.18 | 0.20 | 0.22 |
| Sector16 | Telecommunications | 0.16 | 0.33 | 0.49 | 0.65 | 0.82 | 0.98 | 1.14 | 1.31 | 1.47 | 1.63 |
| Importer1 | Agriculture | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Importer2 | Mining and quarrying | 0.00 | 0.01 | 0.01 | 0.02 | 0.02 | 0.03 | 0.03 | 0.04 | 0.04 | 0.05 |
| Importer3 | Food manufacturing | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Importer4 | Textile industry | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Importer5 | Saw mills and food products | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 |
| Importer6 | Paper industries and | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 |

| | Sector | Growth in 5 years of the total effect due to the change in salary in telecommunication industry (%) | | | | | | | | | |
|-------------|---|--|------|------|------|------|------|------|------|------|------|
| | | 5% | 10% | 15% | 20% | 25% | 30% | 35% | 40% | 45% | 50% |
| | printing | | | | | | | | | | |
| Importer7 | Rubber, chemical and petroleum industries | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 |
| Importer8 | Non-metallic products | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 |
| Importer9 | Metal, metal products and industries | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 |
| Importer10 | Other manufacturing | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| Importer11 | Public utilities | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Importer12 | Transportation and communication | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Importer13 | Services | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Importer14 | Telecommunications | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| HH1 | 1st decile of households | 0.02 | 0.04 | 0.07 | 0.09 | 0.11 | 0.13 | 0.15 | 0.18 | 0.20 | 0.22 |
| HH2 | 2nd decile of households | 0.02 | 0.04 | 0.07 | 0.09 | 0.11 | 0.13 | 0.16 | 0.18 | 0.20 | 0.22 |
| HH3 | 3rd decile of households | 0.02 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.16 | 0.18 | 0.21 | 0.23 |
| HH4 | 4th decile of households | 0.02 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.16 | 0.18 | 0.21 | 0.23 |
| HH5 | 5th decile of households | 0.02 | 0.04 | 0.07 | 0.09 | 0.11 | 0.13 | 0.15 | 0.18 | 0.20 | 0.22 |
| HH6 | 6th decile of households | 0.02 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.16 | 0.18 | 0.20 | 0.23 |
| HH7 | 7th decile of households | 0.02 | 0.04 | 0.07 | 0.09 | 0.11 | 0.13 | 0.15 | 0.18 | 0.20 | 0.22 |
| HH8 | 8th decile of households | 0.02 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.16 | 0.18 | 0.20 | 0.23 |
| HH9 | 9th decile of households | 0.02 | 0.04 | 0.07 | 0.09 | 0.11 | 0.13 | 0.16 | 0.18 | 0.20 | 0.22 |
| HH10 | 10th decile of households | 0.02 | 0.04 | 0.06 | 0.08 | 0.10 | 0.12 | 0.13 | 0.15 | 0.17 | 0.19 |
| Institution | Institution | 0.01 | 0.02 | 0.03 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 | 0.10 | 0.11 |
| Government | Government | 0.01 | 0.02 | 0.03 | 0.04 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 |
| Margin | Margin | 0.04 | 0.08 | 0.12 | 0.16 | 0.19 | 0.23 | 0.27 | 0.31 | 0.35 | 0.39 |
| Tax | Tax | 0.01 | 0.02 | 0.03 | 0.04 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 |
| GDP growth | GDP growth | 0.02 | 0.03 | 0.05 | 0.06 | 0.08 | 0.09 | 0.11 | 0.12 | 0.14 | 0.15 |
| Inflation | Inflation | 0.01 | 0.03 | 0.04 | 0.06 | 0.07 | 0.09 | 0.10 | 0.12 | 0.13 | 0.14 |

Source: Calculation using KS-Telecom-CGE

5.5 Increasing salary of 8 occupations due to skilled labor movement in AEC

The movement of 8 occupations in AEC will boost the Thai economy. By the rising of salaries of these 8 occupations by 50%, the GDP will grow around 2.90% in 5 years or around 0.58% per year (Table 10). The impact is around 20 times compared to the movement of only skilled labor in telecommunications sector presented in the previous section. Top five industries that benefit from these movements are Construction and others (14.92%), Transportation and communication (8.59%), Other manufacturing (7.25%), Trades (7.11%) and Metal, metal products and industries (6.41%). Interestingly, the Textile industry also

benefits from this movement by 6.36% which is the top six of the list. Households that benefit most are the 3rd and 4th deciles even though their salaries are not raised directly by the movement. The poorest deciles of households benefit slightly less. The second richest also benefits quite similarly. However, the richest decile benefits the least which leads this skilled labor movement in AEC to the pro-poorness. Tax and government expenditures rise around 1.65% in 5 years or around 0.33% per year. Transactions in the economy flourishes around 7.59% in 5 years or around 1.52% per year.

Table 10: Impact of increasing salary of 8 occupations due to skilled labor movement in AEC.

| | Sector | Growth in 5 years of the total effect due to the change in salary in telecommunication industry (%) | | | | | | | | | |
|-----------|---|--|------|------|------|------|------|-------|-------|-------|-------|
| | | 5% | 10% | 15% | 20% | 25% | 30% | 35% | 40% | 45% | 50% |
| Sector1 | Agriculture | 0.30 | 0.61 | 0.91 | 1.22 | 1.52 | 1.83 | 2.14 | 2.45 | 2.76 | 3.08 |
| Sector2 | Mining and quarrying | 0.42 | 0.84 | 1.26 | 1.68 | 2.10 | 2.53 | 2.96 | 3.39 | 3.82 | 4.25 |
| Sector3 | Food manufacturing | 0.51 | 1.02 | 1.53 | 2.04 | 2.56 | 3.08 | 3.60 | 4.12 | 4.64 | 5.17 |
| Sector4 | Textile industry | 0.62 | 1.25 | 1.88 | 2.51 | 3.15 | 3.79 | 4.43 | 5.07 | 5.72 | 6.36 |
| Sector5 | Saw mills and food products | 0.45 | 0.90 | 1.35 | 1.80 | 2.26 | 2.71 | 3.17 | 3.63 | 4.10 | 4.56 |
| Sector6 | Paper industries and printing | 0.29 | 0.59 | 0.88 | 1.18 | 1.48 | 1.78 | 2.08 | 2.38 | 2.68 | 2.98 |
| Sector7 | Rubber, chemical and petroleum industries | 0.31 | 0.61 | 0.92 | 1.23 | 1.55 | 1.86 | 2.17 | 2.49 | 2.81 | 3.13 |
| Sector8 | Non-metallic products | 0.31 | 0.62 | 0.93 | 1.24 | 1.55 | 1.87 | 2.18 | 2.50 | 2.82 | 3.14 |
| Sector9 | Metal, metal products and industries | 0.63 | 1.26 | 1.89 | 2.53 | 3.17 | 3.81 | 4.46 | 5.10 | 5.75 | 6.41 |
| Sector10 | Other manufacturing | 0.71 | 1.43 | 2.14 | 2.86 | 3.59 | 4.32 | 5.04 | 5.78 | 6.51 | 7.25 |
| Sector11 | Public utilities | 0.42 | 0.83 | 1.25 | 1.67 | 2.10 | 2.52 | 2.95 | 3.38 | 3.80 | 4.24 |
| Sector12 | Construction and others | 1.46 | 2.93 | 4.41 | 5.89 | 7.38 | 8.88 | 10.38 | 11.88 | 13.40 | 14.92 |
| Sector13 | Trades | 0.70 | 1.40 | 2.10 | 2.81 | 3.52 | 4.23 | 4.95 | 5.67 | 6.39 | 7.11 |
| Sector14 | Transportation and communication | 0.84 | 1.69 | 2.54 | 3.39 | 4.25 | 5.11 | 5.97 | 6.84 | 7.71 | 8.59 |
| Sector15 | Services | 0.41 | 0.83 | 1.25 | 1.67 | 2.09 | 2.51 | 2.94 | 3.36 | 3.79 | 4.22 |
| Sector16 | Telecommunications | 0.56 | 1.13 | 1.70 | 2.27 | 2.84 | 3.42 | 3.99 | 4.57 | 5.16 | 5.74 |
| Importer1 | Agriculture | 0.01 | 0.01 | 0.02 | 0.02 | 0.03 | 0.03 | 0.04 | 0.04 | 0.05 | 0.05 |
| Importer2 | Mining and quarrying | 0.08 | 0.17 | 0.26 | 0.34 | 0.43 | 0.51 | 0.60 | 0.69 | 0.78 | 0.86 |
| Importer3 | Food manufacturing | 0.02 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.16 | 0.18 | 0.21 | 0.23 |
| Importer4 | Textile industry | 0.01 | 0.02 | 0.03 | 0.04 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 |
| Importer5 | Saw mills and food products | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.08 | 0.09 | 0.10 | 0.11 |
| Importer6 | Paper industries and printing | 0.01 | 0.02 | 0.04 | 0.05 | 0.06 | 0.07 | 0.09 | 0.10 | 0.11 | 0.12 |
| Importer7 | Rubber, chemical and petroleum industries | 0.01 | 0.03 | 0.04 | 0.05 | 0.07 | 0.08 | 0.09 | 0.11 | 0.12 | 0.13 |
| Importer8 | Non-metallic products | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.10 | 0.12 | 0.14 | 0.16 | 0.18 |

| | Sector | Growth in 5 years of the total effect due to the change in salary in telecommunication industry (%) | | | | | | | | | |
|-------------|--------------------------------------|--|------|------|------|------|------|------|------|------|------|
| | | 5% | 10% | 15% | 20% | 25% | 30% | 35% | 40% | 45% | 50% |
| Importer9 | Metal, metal products and industries | 0.01 | 0.03 | 0.04 | 0.06 | 0.08 | 0.09 | 0.11 | 0.12 | 0.14 | 0.15 |
| Importer10 | Other manufacturing | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 | 0.10 |
| Importer11 | Public utilities | 0.01 | 0.01 | 0.02 | 0.02 | 0.03 | 0.03 | 0.04 | 0.04 | 0.05 | 0.05 |
| Importer12 | Transportation and communication | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Importer13 | Services | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Importer14 | Telecommunications | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| HH1 | 1st decide of households | 0.43 | 0.85 | 1.28 | 1.71 | 2.14 | 2.58 | 3.01 | 3.45 | 3.89 | 4.33 |
| HH2 | 2nd decide of households | 0.43 | 0.86 | 1.30 | 1.74 | 2.17 | 2.62 | 3.06 | 3.50 | 3.95 | 4.39 |
| HH3 | 3rd decide of households | 0.45 | 0.89 | 1.34 | 1.79 | 2.24 | 2.70 | 3.15 | 3.61 | 4.07 | 4.53 |
| HH4 | 4th decide of households | 0.44 | 0.89 | 1.34 | 1.79 | 2.24 | 2.69 | 3.14 | 3.60 | 4.06 | 4.52 |
| HH5 | 5th decide of households | 0.43 | 0.86 | 1.29 | 1.73 | 2.16 | 2.60 | 3.04 | 3.48 | 3.93 | 4.37 |
| HH6 | 6th decide of households | 0.44 | 0.88 | 1.32 | 1.76 | 2.21 | 2.66 | 3.11 | 3.56 | 4.01 | 4.47 |
| HH7 | 7th decide of households | 0.42 | 0.85 | 1.28 | 1.71 | 2.14 | 2.57 | 3.01 | 3.45 | 3.88 | 4.32 |
| HH8 | 8th decide of households | 0.43 | 0.86 | 1.30 | 1.74 | 2.17 | 2.62 | 3.06 | 3.50 | 3.95 | 4.39 |
| HH9 | 9th decide of households | 0.42 | 0.85 | 1.28 | 1.71 | 2.14 | 2.57 | 3.00 | 3.44 | 3.88 | 4.32 |
| HH10 | 10th decide of households | 0.35 | 0.71 | 1.07 | 1.43 | 1.79 | 2.15 | 2.51 | 2.87 | 3.24 | 3.61 |
| Institution | Institution | 0.21 | 0.43 | 0.64 | 0.85 | 1.07 | 1.29 | 1.50 | 1.72 | 1.94 | 2.16 |
| Government | Government | 0.16 | 0.32 | 0.49 | 0.65 | 0.82 | 0.98 | 1.15 | 1.31 | 1.48 | 1.65 |
| Margin | Margin | 0.75 | 1.49 | 2.25 | 3.00 | 3.76 | 4.52 | 5.28 | 6.05 | 6.82 | 7.59 |
| Tax | Tax | 0.16 | 0.32 | 0.49 | 0.65 | 0.82 | 0.98 | 1.15 | 1.31 | 1.48 | 1.65 |
| GDP growth | GDP growth | 0.29 | 0.57 | 0.86 | 1.15 | 1.44 | 1.73 | 2.02 | 2.31 | 2.61 | 2.90 |
| Inflation | Inflation | 0.27 | 0.55 | 0.82 | 1.10 | 1.37 | 1.65 | 1.93 | 2.21 | 2.49 | 2.78 |

Source: Calculation using KS-Telecom-CGE

5.6 Increasing by 39.50% and based salary for bachelor graduates by 29.20% with increasing salary of 8 occupations due to skilled labor movement in AEC

The combination of the impact of RIP and the movement of skilled labor in AEC is negative. It is obvious that the positive impact from the movement of skilled labors cannot compensate the negative impact of the RIP. GDP will fall around 12.1% in 5 years when the salary of skilled labor rises 50% (Table 11). Compared to the only negative impact of RIP, 14.34%, the movement of skilled labor will help lessen the negative impact just around 2.24 percentage points. Sectors that suffer from the RIP continue the suffering. The combined impact cannot make the impact pro-poor when the richest decide of households suffer less than the poor. Tax and government expenditures fall around 7.2% in 5 years or around 1.44% per year. Transactions in the economy falls 28.6% in 5 years or around 5.72% per year.

| Sector | Growth in 5 years of the total effect due to the change in salary in telecommunication industry (%) | | | | | | | | | |
|-------------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 5% | 10% | 15% | 20% | 25% | 30% | 35% | 40% | 45% | 50% |
| M13 Services | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| M14 Telecommunications | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| H1 1st decide of households | -21.6 | -21.3 | -21.0 | -20.6 | -20.3 | -20.0 | -19.6 | -19.3 | -19.0 | -18.6 |
| H2 2nd decide of households | -21.9 | -21.6 | -21.2 | -20.9 | -20.6 | -20.2 | -19.9 | -19.5 | -19.2 | -18.9 |
| H3 3rd decide of households | -22.4 | -22.1 | -21.8 | -21.4 | -21.1 | -20.7 | -20.4 | -20.0 | -19.7 | -19.3 |
| H4 4th decide of households | -22.3 | -22.0 | -21.6 | -21.3 | -20.9 | -20.6 | -20.2 | -19.9 | -19.5 | -19.2 |
| H5 5th decide of households | -21.8 | -21.5 | -21.1 | -20.8 | -20.5 | -20.1 | -19.8 | -19.5 | -19.1 | -18.8 |
| H6 6th decide of households | -22.1 | -21.8 | -21.5 | -21.1 | -20.8 | -20.4 | -20.1 | -19.7 | -19.4 | -19.0 |
| H7 7th decide of households | -21.4 | -21.0 | -20.7 | -20.4 | -20.1 | -19.7 | -19.4 | -19.1 | -18.7 | -18.4 |
| H8 8th decide of households | -21.6 | -21.2 | -20.9 | -20.6 | -20.2 | -19.9 | -19.6 | -19.2 | -18.9 | -18.5 |
| H9 9th decide of households | -20.6 | -20.3 | -20.0 | -19.7 | -19.3 | -19.0 | -18.7 | -18.3 | -18.0 | -17.7 |
| H10 10th decide of households | -17.2 | -17.0 | -16.7 | -16.4 | -16.1 | -15.9 | -15.6 | -15.3 | -15.0 | -14.8 |
| INT Institution | -11.8 | -11.7 | -11.5 | -11.4 | -11.2 | -11.0 | -10.9 | -10.7 | -10.5 | -10.4 |
| G Government | -8.3 | -8.2 | -8.1 | -8.0 | -7.8 | -7.7 | -7.6 | -7.4 | -7.3 | -7.2 |
| MG Margin | -33.8 | -33.3 | -32.7 | -32.1 | -31.5 | -30.9 | -30.4 | -29.8 | -29.2 | -28.6 |
| TX Tax | -8.3 | -8.2 | -8.1 | -8.0 | -7.8 | -7.7 | -7.6 | -7.4 | -7.3 | -7.2 |
| GG GDP growth | -14.1 | -13.9 | -13.7 | -13.5 | -13.2 | -13.0 | -12.8 | -12.6 | -12.3 | -12.1 |
| IN Inflation | -14.0 | -13.8 | -13.6 | -13.3 | -13.1 | -12.9 | -12.7 | -12.5 | -12.3 | -12.1 |

Source: Calculation using KS-Telecom-CGE

5.7 Increasing by 39.50% and based salary for bachelor graduates by 29.20% with increasing salary of 8 occupations to restore the economy

The last section of the results will answer how much of the rising salary due to the movement of skilled labor in AEC that can restore the economy from the negative impact of RIP. The numbers are around 390% to 410% (Table 12). By the raising of salary of 8 occupations in AEC who move inward Thailand by 390%, the sector of Non-metallic products will be restored. Trades and telecommunications are restored before that level. The income of the richest and second richest decides will be restored. However, the overall GDP cannot turn to the neutral level.

By the raising of the salary 395%, the GDP growth will turn into positive. The service sector will be restored. The income of the upper-middle-class, the 8th decide of households, will be also restored after the richest ones.

By the raising of the salary by 400% or 4 times, the household economy will be all restored. The income growths of the 1st decide to the 7th decide will turn into positive. However, tax and government expenditure will be restored when the salary rise 410%. The deflation will turn into inflation at that threshold too.

Many sectors will even be unable to restore after the salary rises 410%. They are agricultural sector, Food manufacturing, Sawmills and food products, Paper industries and printing and the Institutions.

Table 12: Impact of increasing by 39.50% and based salary for bachelor graduates by 29.20% with increasing salary of 8 occupations to restore the economy.

| | | Growth in 5 years of the total effect due to the change in salary in telecommunication industry (%) | | | |
|------------|---|--|-------------|-------------|--------------|
| Sector | | 390% | 395% | 400% | 410% |
| Sector1 | Agriculture | -2.04 | -1.74 | -1.45 | -0.86 |
| Sector2 | Mining and quarrying | 3.29 | 3.69 | 4.10 | 4.91 |
| Sector3 | Food manufacturing | -2.63 | -2.14 | -1.65 | -0.66 |
| Sector4 | Textile industry | -1.27 | -0.66 | -0.06 | 1.16 |
| Sector5 | Saw mills and food products | -2.11 | -1.68 | -1.25 | -0.37 |
| Sector6 | Paper industries and printing | -2.10 | -1.82 | -1.53 | -0.96 |
| Sector7 | Rubber, chemical and petroleum industries | 1.10 | 1.40 | 1.70 | 2.30 |
| Sector8 | Non-metallic products | 0.11 | 0.41 | 0.71 | 1.31 |
| Sector9 | Metal, metal products and industries | 3.68 | 4.29 | 4.90 | 6.13 |
| Sector10 | Other manufacturing | -1.54 | -0.85 | -0.16 | 1.23 |
| Sector11 | Public utilities | 3.66 | 4.06 | 4.47 | 5.28 |
| Sector12 | Construction and others | 7.30 | 8.72 | 10.15 | 13.01 |
| Sector13 | Trades | 1.88 | 2.56 | 3.24 | 4.60 |
| Sector14 | Transportation and communication | 4.73 | 5.54 | 6.36 | 8.01 |
| Sector15 | Services | -0.32 | 0.08 | 0.48 | 1.29 |
| Sector16 | Telecommunications | 5.20 | 5.74 | 6.29 | 7.40 |
| Importer1 | Agriculture | -0.01 | -0.01 | 0.00 | 0.01 |
| Importer2 | Mining and quarrying | -0.19 | -0.11 | -0.02 | 0.14 |
| Importer3 | Food manufacturing | -0.05 | -0.03 | -0.01 | 0.04 |
| Importer4 | Textile industry | -0.02 | -0.01 | 0.00 | 0.01 |
| Importer5 | Saw mills and food products | -0.02 | -0.01 | 0.00 | 0.02 |
| Importer6 | Paper industries and printing | -0.03 | -0.02 | 0.00 | 0.02 |
| Importer7 | Rubber, chemical and petroleum industries | -0.03 | -0.02 | 0.00 | 0.02 |
| Importer8 | Non-metallic products | -0.04 | -0.02 | 0.00 | 0.03 |
| Importer9 | Metal, metal products and industries | -0.03 | -0.02 | 0.00 | 0.02 |
| Importer10 | Other manufacturing | -0.02 | -0.01 | 0.00 | 0.02 |
| Importer11 | Public utilities | -0.01 | -0.01 | 0.00 | 0.01 |
| Importer12 | Transportation and communication | 0.00 | 0.00 | 0.00 | 0.00 |
| Importer13 | Services | 0.00 | 0.00 | 0.00 | 0.00 |
| Importer14 | Telecommunications | 0.00 | 0.00 | 0.00 | 0.00 |
| HH1 | 1st decide of | -0.76 | -0.35 | 0.06 | 0.89 |

| | | Growth in 5 years of the total effect due to the change in salary in telecommunication industry (%) | | | |
|-------------|---------------------------|--|-------------|-------------|--------------|
| Sector | | 390% | 395% | 400% | 410% |
| | households | | | | |
| HH2 | 2nd decide of households | -0.72 | -0.31 | 0.11 | 0.95 |
| HH3 | 3rd decide of households | -0.60 | -0.17 | 0.26 | 1.13 |
| HH4 | 4th decide of households | -0.54 | -0.11 | 0.32 | 1.18 |
| HH5 | 5th decide of households | -0.70 | -0.29 | 0.13 | 0.96 |
| HH6 | 6th decide of households | -0.58 | -0.16 | 0.27 | 1.12 |
| HH7 | 7th decide of households | -0.50 | -0.09 | 0.32 | 1.14 |
| HH8 | 8th decide of households | -0.36 | 0.06 | 0.47 | 1.31 |
| HH9 | 9th decide of households | 0.24 | 0.65 | 1.06 | 1.89 |
| HH10 | 10th decide of households | 0.20 | 0.55 | 0.89 | 1.58 |
| Institution | Institution | -1.42 | -1.22 | -1.01 | -0.60 |
| Government | Government | -0.36 | -0.20 | -0.05 | 0.27 |
| Margin | Margin | 2.92 | 3.65 | 4.37 | 5.83 |
| Tax | Tax | -0.36 | -0.20 | -0.05 | 0.27 |
| GDP growth | GDP growth | -0.09 | 0.19 | 0.46 | 1.02 |
| Inflation | Inflation | -0.60 | -0.33 | -0.07 | 0.46 |

Source: Calculation using KS-Telecom-CGE

6. Discussions

In the first part, this study figures out the impact of raising the minimum wage by 39.50% to the Thai economy. The policy will shrink the GDP by 10.84% in 5 years or around 2.17% per year which is above than the estimation of Thailand Development Research Institute (2013) of 1.70% per year. Moreover, it also finds that the effect is not pro-poor when the poor suffer from the RIP more than the rich. This is accordant to the study of Chaiwan and Suriya (2013).

By the results of this KS-Telecom-CGE model, the prediction of the combined impact of both the raising of minimum wage and based salary is around 2.87% per year which is even higher than the effect that TDRI predicted. Moreover, transactions in the economy will fade out around one-third of the present ground. To reflect this, it is necessary to recall the suggestion from TDRI (2012 and 2013) that emphasized the government subsidies into industries to boost their labor productivity by 8% - 10% via subsidies otherwise the economy would fall around 1.70% per year. These subsidies are crucial for Construction and others, Transportation and communication, Trades, Other manufacturing and Textile industry. Around one-third or more of the value-adds in those sectors, and more than half of the value-adds in the Construction and others, will fade out from the Thai economy unless the government miss to deliver the subsidies.

It is noticeable that the richest households in the 10th decide will even suffer less than the second richest in the 9th decide. This results leads to the question whether the government

intends before launching the RIP such that the policy, if there are some negative effects, will affect the rich less than the poor. This policy may be designed to protect the rich especially those persons who occupy positions in the government. The more divided gap between the rich and the poor will eventually make the rich richer and the poor poorer. In the view of the government, this might be good for the next election when the rich get more than enough capitals to invest into the election campaigns while offer the poor the populism policies that promise to help them but instead harm them in the long-run. The authors are not sure about these points and need to find more evidences to support these ideas probably in further studies.

In the second part of the study, it investigates the impact of the movement of skilled labors in AEC into Thailand. It begins from only the telecommunication sector. It finds that the impact is not much. There are three interesting points. First, the impact is positive. Second, telecommunications sector will benefit from this movement the most. Third, the movement is pro-poor. For the first point, the positive impact is because the movement of the skilled labors raises the salary of people in the middle-class including the 5th until the 8th deciles of households. The increasing salary will raise their purchasing power. Besides, these middle-class people are not the major factors in productions. Therefore, the rising cost of production is less than the rising consumption which leads to the growth of the economy. For the second point, telecommunication sector benefits more than other sectors because its income will be higher due to the rising salary which includes in the cost of production. It charges the rising cost to the price. When other sectors and households cannot reduce the consumption of telecommunications products much, technically the elasticity of substitution is quite inelastic; the rising price will make more income to the sector. This rising income can compensate the rising salary. Therefore, the movement of skilled labor into the telecommunications sector positively affects the telecommunications sector more than other sectors. For the third point, the pro-poor effect comes from the rising salary of the middle-class and not the richest deciles. This is by the assumption that engineers who move around AEC countries are people in the middle-class. The two richest deciles, the 9th and 10th deciles of households, are reserved for entrepreneurs, elites from the rich families and owners of big businesses who never work for salary but profit instead. The more interesting point is that the impacts to the poorest households are quite similar to those impacts to the middle-class even though the poorest households are not directly paid higher. The reason is that the poor benefit from the rising economy. When the whole economy flourishes, the firms gain more from their sales. Then they pay more to households. The multiplier works well enough to ensure the spill-over effect of this flourishing economy to the poor eventually.

It is also found from the study that the movement of skilled labor in 8 occupations in AEC brings prosperity to Thailand. The spillover effect will also lead the poorest households benefit quite similarly to the middle-class. However, the movement is pro-poor. The richest decile of households benefit the least in the economy. Interestingly, the impact of the movement in 8 occupations is around 20 times higher than the impact of the movement in only telecommunications sector. This result reveals the importance of the relevant sectors into that the skilled labor will move. They are Mining and quarrying (sector 2), Rubber, chemical and petroleum industries (sector 7), Metal, metal products and industries (sector 9), Public utilities (sector 11), Construction and others (sector 12), Transportation and communication (sector 14), Services (sector 15) and Telecommunications (sector 16).

Another interesting point is that sectors that benefit from the movement of skilled labor in AEC are quite the same as those sectors that suffer from the RIP. They are 6 industries including Construction and others, Transportation and communication, Other manufacturing,

Trades, Metal & metal products and industries, and Textile industry. This is because these sectors generate more value-adds in the economy. They also employ more people. Therefore, they are more sensitive to the change in wage and salary. Half of them pay higher to the skilled labor, i.e. Construction and others, Metal, metal products and industries and Transportation and communication. These sectors benefit directly from charging higher price into the products while the elasticities of substitution are quite inelastic. Another half of them, even though they do not pay directly to the skilled labors, benefit from the prosperity of the economy through the multiplier and spill-over effect.

The merits of the movement of skilled labor in AEC cannot compensate the negative impact of the RIP. It is possible to restore the economy only when the salary of those skilled labors are raised around 390% to 410%. This statement might mean that it is impossible to do so. Even at those levels, some sectors cannot be restored. They are sectors that deeply suffer from the RIP due to the sharply rising wage and low labor productivity with low positive impact from the movement of skilled labor in AEC.

7. Conclusions

It is clear from the study that the claim made by the government that the Raising Income Policy (RIP) can help the poor, especially on boosting their income, is not true in the long-run. The results from the KS-Telecom-CGE which tends to predict the results for the next 5 years reveal that the RIP causes negative impacts to the Thai economy instead. These are due to the rising costs of production and living expenses with the shrinkage of employment which in turns reduce household's nominal and real income. The RIP is not pro-poor when the poor suffer from the negative impact more than the rich.

Inward skilled labor movement to Thailand in the telecommunication sector leads to the increasing income of engineers and related skilled workers in the country. This yields the positive impact to the economy due to the increasing income of the middle-class people while costs of production do not increase much. The inward skilled labor movements in all 8 occupations will even yield around 20 times more positive impacts to the Thai economy. The movement of skilled labor in AEC is pro-poor to the Thai economy when it boosts the income of the poor more than that of the rich.

However, the positive impacts of the skilled labor movements in AEC cannot compensate the negative impacts of the RIP. Unless the salaries of the skilled labors are raised around 4 times compared to the level in 2010, the economy cannot restore from the negative impact generated by the RIP.

8. Policy suggestions

There are some policy suggestions that should be remarked as follows:

1. Thailand should promote the movement of skilled labors in 8 occupations into its economy. The country should not be scared by losing the jobs to foreigners. Instead, the movement will bring prosperity to the economy. Barriers to entry such as qualification examinations in Thai language should be removed.
2. The economy should ensure the spill-over effect from the prosperity brought by the movement of skilled labors in AEC toward the poor by the ensuring the free economy under market mechanism. Any intervention may prevent the multiplier to work properly and may undermine the spill-over effect.

3. The Thai economy should not develop the expectation that the positive impact from the movement of skilled labors in AEC will compensate the negative impact generated by the RIP.
4. The government subsidy to boost labor productivity is a must for the Thai economy. Without the subsidy, industries may not be able to adapt themselves through the transition period and lay-off massive amount of labors which lead to the recession of the economy where some significant industries may fade out more than one-third of their present grounds.

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