

Impact of Global Economic Crisis on the Employment and Migrant Workers of Developing Countries in Southeast Asia: A Case Study of Thailand

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As a result of the recently global financial crisis, unemployment rates have continued to rise and household budgets have reduced worldwide, especially in the US. The concerns are raised about the unemployment in the developing countries where mainly export goods to those countries. A possible raise in returning migration from the developed country might increase the prospect of rising unemployment in the developing country. This paper aims to analyze the impact of global economic crisis on the employment of Thai labour market, one of the developing countries in the Southeast Asia. The analytical framework is Computable General Equilibrium Models (CGE) with imperfect labour market conditions, including the minimum wage as well as originally applying the Difference in Difference estimation. It originally and empirically contributes to a measure to evaluate the impact of the economic crisis on the employment of registered and unregistered immigrants as well as informal and formal natives. All proxies representing the economic crisis are shocked in the CGE models including trade flows, technology, capital flows, and international migration. The result of the study suggests that the economic crisis discourages the new registers to apply for those countries, but there has no significance in the number of returned migrant. In addition, Thailand has encountered the different impact on various groups of labour and economic sectors. The number of low-skilled worker of the manufacturing in Thailand has suffered, yet in the short term. The informal employment, especially in the agricultural sector, helps absorb the number of unemployment from the formal sectors as other Southeast Asia countries. The study also investigates the Thai current labour policy tackling the crisis.

Keywords: Economic crisis, Economic globalization, Thai labour market, Minimum wage, Registered Migrant Worker, Unregistered Migrant Workers, Formal and Informal Workers, High skilled workers, Low skilled workers

1. INTRODUCTION

The global economic environment has a rapid change from the past 30 years through the intensive linkages by the globalization. The economic crisis happening in one continent impacts on the other continents quickly and significantly in these decades. As a result of the global financial crisis in 2009 in the Western continent, unemployment rates have continued to rise and household budgets have reduced worldwide. The concerns are raised about the unemployment in the developing countries where mainly export goods to those countries. Moreover, since the number of migrant workers increase in the era of globalization, a possible raise in returning migration from developed countries might increase the prospect of rising unemployment in the developing country.

To investigate the impact of the recently global economic crisis on the developing countries, this paper select Thailand as a representative case for the developing countries in the Mainland Southeast Asia¹ which composes of Cambodia, Lao PDR, Vietnam, Myanmar and Thailand. The comparing case should exclude the situation in Myanmar due to the dissimilitude of governmental system. Moreover, the data of Myanmar is hardly accessible, especially trade data.

As can be seen in the Table 1.1, these countries are lower and middle income countries. Cambodia, Lao PDR, and Vietnam are the net positive FDI inflows. The export of good and service was approximately 60 to 70% of GDP in these three counties. In addition, the employment to population ratio is more than 70%. The growth rate of the GDP per capita also shows the similar trend. Before the economic crisis the growth rate was consistently at a number. After the crisis, the number has plugged in 2008 and become negative in the later year. Since Thailand shares similar features of the countries in this area, particularly Vietnam and Cambodia.

Table 1.1 Economic Environment of Mainland Southeast Asia(selected)*

	Cambodia	Lao PDR	Vietnam	Thailand
	Low income	Low income	Lower middle income	Lower middle income
	Growth rate of GDP per capita, PPP (constant 2005 international \$)			
2006	9%	7%	7%	4%
2007	8%	6%	7%	4%
2008	5%	5%	5%	2%
2009	-3%	4%	4%	-3%
	Foreign direct investment, net inflows (% of GDP)			
2006	6.63	5.32	4.02	4.56
2007	10.38	7.55	9.79	4.58
2008	8.64	4.16	11.79	3.13
2009	5.37	5.36	8.44	1.89
	Foreign direct investment, net outflows (% of GDP)			
2006	0.11	-	0.14	0.47
2007	0.01	-	0.27	1.22
2008	0.22	-	0.37	1.50
2009	0.19	-	0.78	1.56
	Exports of goods and services (% of GDP)			
2005	64.08	33.11	69.36	73.57
2006	68.59	38.39	73.61	73.60
2007	65.33	35.69	76.90	73.38
2008	65.54	32.72	77.92	76.49
2009	59.61	-	68.30	68.37

¹ Malaysia composes of Mainland and Maritime Southeast Asia. The Maritime Southeast Asia, comprising Brunei, East Malaysia, East Timor, Indonesia, the Philippines, and Singapore, does not include in this study due their various economic characteristics. The lower employment share in Malaysia is due to the religious and cultural differences comparing to Cambodia, Lao PDR, Myanmar, Vietnam and Thailand.

	Employment to population ratio, 15+, total (%)			
2005	74.50	78.00	70.00	72.50
2006	74.20	77.70	69.70	72.00
2007	74.60	77.80	69.50	71.80
2008	74.60	77.70	69.40	71.50

Note: There is no data about trade available in Myanmar.

Source: World Data Bank, World Development Indicators (WDI)&Global Development Finance(GDF)

This research contributes to develop a framework using a Computable General Equilibrium Model with imperfect labour market conditions due to the minimum wages, the formal and informal employment as well as the registered and unregistered migrants. It attempts to evaluate the effect on the employment of all groups. In addition, a Different in Different method is initially applied with the CGE to find the real effects of economic globalization on the employment.

This paper is classified into six parts. The first part is the introduction. The second part demonstrates overview of the Thai labour market during the recent economic crisis. The third part posits the framework and channels of economic crisis effecting on the Thai labour market. To measure the effect of economic crisis, not only the trade data used commonly in the previous studies, but also the other channels representing the economic crisis are introduced in the analysis. Those channels include technology, flows of capital and migrant works provides linkages among countries through the economic globalization. This approach provides comprehensive evaluation of economic crisis on the labour market. The domestic labour conditions are also discussed in this section. The fourth part demonstrates analytical models applied in this study. The fifth section demonstrates the results of the economic crisis on the Thai Economy. The conclusion and policy implications, as well as the Thai current labour policy, are provided in the last section.

2. THAI LABOUR MARKET DURING THE RECENTLY ECONOMIC CRISIS

This section highlights the effects of economic crisis on the labor market. The overall employment, the duality of the public and private employment, as well as the international migrant workers are investigated in this section.

The recently economic crisis in 2009 had a stronger impact on the experienced workers than the impact of new entries. As can be seen in Table 2.1, the number of workers, who is previously used to work, jumps from 325 to 433 thousand unemployed persons. The unemployment increases from about 1.4 in the previous years to 1.6 in 2009. The number of new entries to the labour market, instead, has declined. It is possible that there is the substitution of the new entry to the experienced one, yet the shift up in the employment of the experienced workers is distinguishably far beyond the new entry.

Table 2.1 Unemployed person classified by work experience and unemployment rate

	Total Unemployed('000)	Never work('000)	Used to work in the previous month of the survey('000)	Unemployment rate
2006	574.52	200.61	373.91	1.59
2007	528.02	205.34	322.68	1.44
2008	510.38	185.44	324.93	1.36
2009	611.44	178.92	432.52	1.60
2010	417.33	142.60	274.73	1.13

Note: Average of monthly data. Since, the data availability in 2010 is limit to October, to avoid the effect of seasonal unemployment. All data are averaged from January to October.

Source: National Statistical Office

The share of experienced unemployed persons, who used to work in each economic sector, is demonstrated in the Table 2.2. Clearly, the most suffered sector was the manufacturing sector because of its suddenly shifted up share of unemployed persons. The agricultural sector absorbed the employment of economic crisis in 2009. This situation coincidentally happened with the higher price of agricultural produce.

Table 2.2 Average share of unemployed workers who used to work in the previous month of the survey classified by the industrial sector of their previous work

	Agriculture	Manufacture	Service	Total
2006	26	22	51	100
2007	21	26	53	100
2008	21	26	52	100
2009	17	31	52	100
2010	18	28	54	100

Note: Average of monthly data. Since, the data availability in 2010 is limit to October, to avoid the effect of seasonal unemployment; all data are averaged from January to October in the quarter 3.

Source: National Statistical Office

Interestingly, the employment growth has been increased about 1-2% in 2007 - 2010. It is the combination of government's objectives to decrease the unemployment rate and the characteristic of informal sector in Thailand which is flexible and absorbable unemployed from the formal one.

The employment growth of the public sector has steadily increased at more than 3%. The employment of the private sector has also increased. Yet, the classification by formality shows that the formal employment declines, while the informal sector increases. This contrary helps relieve number of the unemployment rate in the private sector. However, the informal workers do not have secure employment contracts, worker's benefits, social protection or workers' representation. The problem of the working poor is not that they are unemployed, yet they are poor in working condition (Sato and Murayama (2008): 4-5). Their wages are mostly lower than the formal one. Some workers must be informally employed for their survival and wait to enter

into formal employment. This is supported by an assumption of Sussangkarn (1987) that workers prefer to work in the formal sector rather than the informal one.

Table 2.3 Average employed workers classified by the formality of employment

	Total		Public sector		Private sector		Private sector: formal		Private sector: informal	
	Number ('000)	Growth	Number ('000)	Growth	Number ('000)	Growth	Number ('000)	Growth	Number ('000)	Growth
2006	35,505		3,024		32,482		14,451		18,031	
2007	36,072	1.6%	3,119	3.2%	32,953	1.5%	14,650	1.4%	18,303	1.5%
2008	36,833	2.1%	3,228	3.5%	33,605	2.0%	14,800	1.0%	18,806	2.7%
2009	37,492	1.8%	3,326	3.0%	34,166	1.7%	14,842	0.3%	19,324	2.8%
2010	37,880	1.0%	3,585	7.8%	34,295	0.4%	14,704	-0.9%	19,591	1.4%

Note: Average of monthly data. Since, the data availability in 2010 is limit to October, to avoid the effect of seasonal unemployment, all data are averaged from January to October.

Source: National Statistical Office

Thailand is also the net emigrant countries. Table 2.3, the number of Thai workers working aboard has decreased. In 2009, the number of total new register explicitly dropped; while the number of the reentries slightly increased. However, it was due to the negative influence of Asia and Middle East. Focusing on the North America, where has encountered the most severe problems, it is interesting that the number of new register has declined, while the reentry has moderately increase. It implies that once the workers have a chance to legally reenter, they tend to remain in the labour market, given any economic situation. In Europe, the new registered workers are substantially high in 2009, before drop in 2010. In overall, the number of Thai workers applies for working permit in Europe remains increase.

Noticeably, the number of both new registers and reentries to Asia suddenly shifts down in 2009. However, the destination of the Thai workers working aboard has sought other opportunities in Africa, South America, and Australia and Oceania instead.

Table 2.3 Thai workers working aboard by destination: Total, new registry, and re-entry worker

Total	2006	2007	2008	2009	2010	Average Growth Rate
Middle East	27,326	33,833	36,644	32,057	27,543	1%
Africa	3,897	5,529	8,453	10,599	12,557	35%
Asia	118,647	108,658	101,855	88,998	88,817	-7%
Europe	6,141	8,960	9,883	11,176	9,728	14%
North America	4,042	3,622	3,429	3,395	3,306	-5%
South America	41	7	186	96	62	598%
Australia and Oceania	752	1,308	1,402	1,390	1,782	27%
Total Thai workers	160,846	161,917	161,852	147,711	143,795	-3%
New register	2006	2007	2008	2009	2010	Average Growth Rate
Middle East	18,773	23,653	24,281	17,697	13,636	-5%
Africa	2,743	3,839	6,299	7,144	7,628	31%
Asia	76,260	63,971	54,080	43,832	49,488	-9%
Europe	3,610	6,244	6,773	8,150	6,780	21%
North America	1,647	1,359	1,108	962	902	-14%
South America	37	3	114	21	42	907%
Australia and Oceania	495	917	945	911	1,316	32%
Total New Register	103,565	99,986	93,600	78,717	79,792	-6%
Reentry	2006	2007	2008	2009	2010	Average Growth Rate
Middle East	8,553	10,180	12,363	14,360	13,907	13%
Africa	1,154	1,690	2,154	3,455	4,929	44%
Asia	42,387	44,687	47,775	45,166	39,329	-2%
Europe	2,531	2,716	3,110	3,026	2,948	4%
North America	2,395	2,263	2,321	2,433	2,404	0%
South America	4	4	72	75	20	408%
Australia and Oceania	257	391	457	479	466	18%
Total Re-entry	57,281	61,931	68,252	68,994	64,003	3%

Source: Thailand Overseas Employment Administration, Department of Employment, Ministry of Labour.

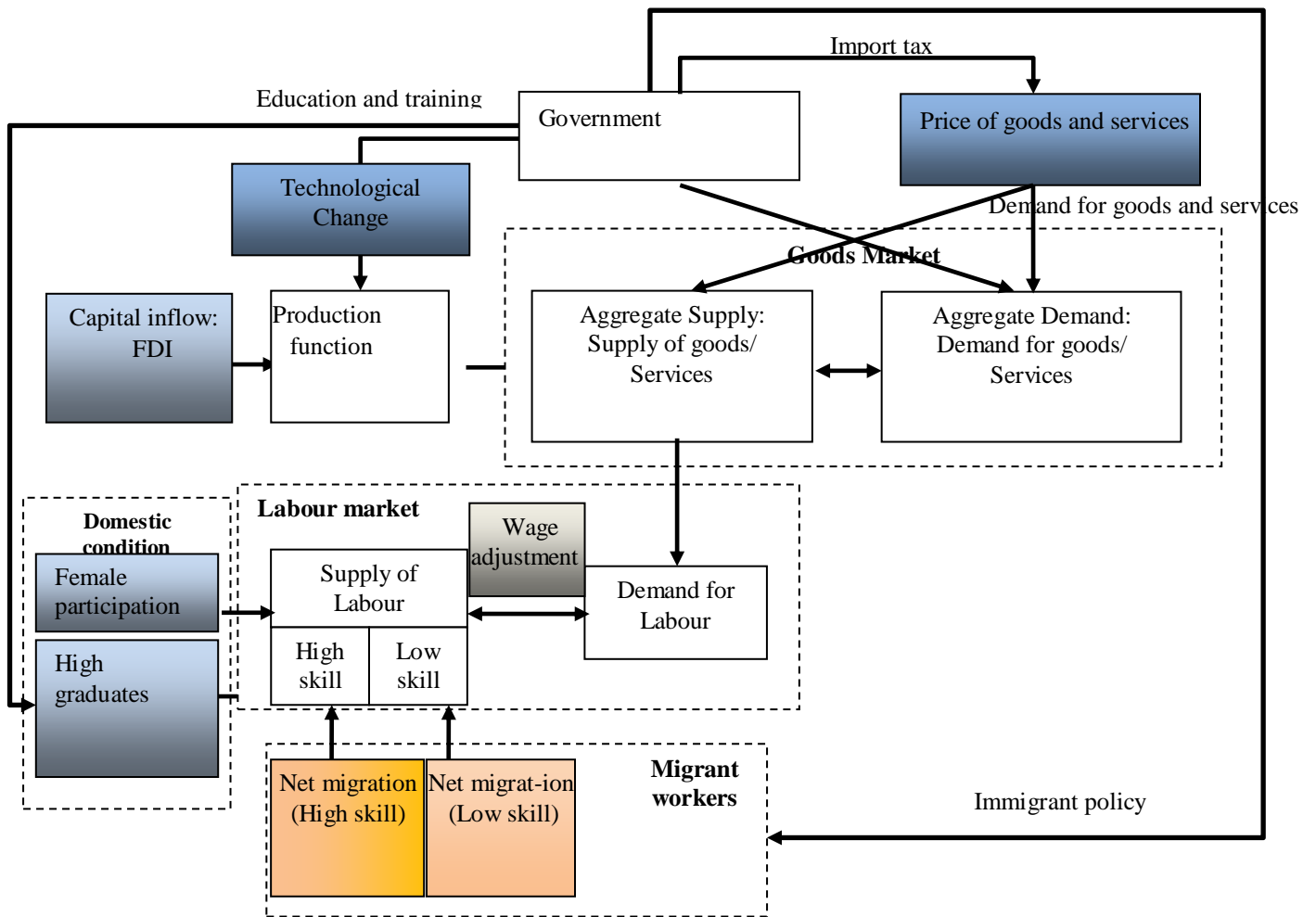
3. FRAMEWORK OF THE STUDY AND CHANNELS OF ECONOMIC CRISIS ON THE LABOUR MARKET

The framework of the study is demonstrated in this section. To seek the comprehensive approach evaluating the impact of economic crisis on the labour market, all economic linkages effecting on the labour market are considered. The economic globalization representing those linkages of the economic crisis are discussed its impacts on the labour market. The economic crisis provided the exogenous changes, including the decrease in the trade volume, the reduction in flows of capital from the West, changing in technology and the dynamic of migrant

workers. To capture all above affects, the Computerize General Equilibrium(CGE) is applied in this study since it is able to simultaneously determine production, consumption, prices for all goods and services and demand for labor as well (Figure 3.1).

However, it requires the following assumptions. (1) The good market is competitive. (2) Government is treated as the exogenous factor. High-skilled (H) and low-skilled (L) workers are grouped into two types of workers: formal and informal and. migrant workers are also classified into two groups: high and low skilled migrants. The programs used are GAMS, and Eviews.

Figure 3.1 Framework of the Study: Channels of economic crisis impact on the labour market through the economic globalization

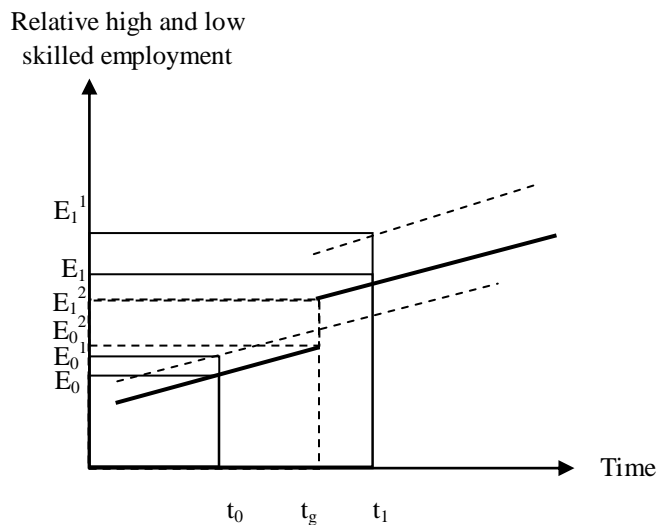


Due to the data limitation, the structure of the production bases on the recent data of Input-Output (IO) table in 2005. The main sources of data concerning labor and household behavior are drawn from the Labor Force Survey from 2004 to 2010 and the Household Socio-Economic Survey from 2004 to 2009(the most recent data). The methodology to measure the effects of

economic crisis on the employment of the natives and the migrant workers will be processed as follows.

- 1) First of all the parameters are classified into 2 sets: The parameter representing domestic conditions and the parameter representing exogeneous factors which donates for economic crisis. The data is also classified into 2 sets: the parameter before the economic crisis and the current data, which represents the effects on their employment. Note that the technology of the production does not change due to the data limitation. The total employment is to serve the domestic force and the external force. *Assuming no change in economic environment, the employment growth rate of the natives should remain its value at the natural rate of (un)employment.*
- 2) The trend of all exogonous parameters in 2004-2007 is firstly assumed to represent “stable situation” in 2008-2010. All exogeneous factors are shocked in the model. The employment of each labour group will be estimated. The result of the model implies the employment, if there was no economic crisis. The simple analysis is to look at the result comparing to the actual data representing the economic crisis. *However, domestic economic environment is also changed overtime, the following process aims to deduct the domestic influence on the employment.*
- 3) To estimate the result of economic crisis, the actual exogeneous data in 2009, excluding domestic employment and migrant workers, are inputted into the model.
- 4) The actual employment incorporates both domestic and external effects. Then, *the domestic effect is subtracted out to represent only the effect of the economic crisis on the employment.*

Figure 6.1 Measuring the effect of globalization on the employment



Note: The bold lines are the supposed lines. They are unnecessary to slop upward.

$E_1 - E_0 = \text{True effect.}$

$E_0^1 - E_0 = \text{estimated effect on employment before current economic crisis}$

$E_1^1 - E_1 = \text{estimated effect on employment after current economic crisis}$

$(E_1^1 - E_1) - (E_0^1 - E_0) = \text{Effect of economic crisis on the labor market.}$

The following section defines the impact of economic globalization on labour market into five main channels: trade movement, information and technology, international flows of factors of production (labour and capital), domestic labor conditions, and the institutional effect. The explanation of the each channels and its impact on labour market is demonstrated as the followings.

A. Change in trade volume and the labour market

An increase in trade volume is claimed to increase the demand for labour. The Heckscher-Ohlin (HO) trade model, one of the most influential theories in international trade, points out that trade is based on different factor endowments across countries. The Stolper-Samuelson theorem (SS), also provides the linkage of changes in the production prices on factor returns. Both HO and SS theories predict that greater trade openness will increase incentives (through relative price changes) of domestic producers to specialize in the goods with relatively abundant factor of production. For example, a country with low-skilled workers tends to specialize in labour-intensive goods. As a result, the demand for low- skilled workers increases.

The Thai export value and the Thai import value were greater than world average values since 1989 and 1990, sequentially. This implies that the Thai foreign trade dependency ratio significantly increased over world averages since the end of the 1980s and the beginning of the 1990s. Thailand has been claimed to be a labour-intensive economy. Under this theory, economic globalization should encourage the demand for low-skilled workers. Particularly in the export countries, as a result of the economic crisis, the employment should decrease due to the lower demand of goods.

B. Change in the information and technology and the labour market

The technology, which is directly influence on the demand for labour is relevant to the production. New technologies and knowledge require a compatible workforce. This theory is Skilled Biased Technological Change (SBTC). It is claimed that the introduction of new technologies in lower income countries reallocate labour from low to high productivity activities which are generally more capital and skill intensive.

This theory posits that if new technological advances are continuously introduced into the labour markets; high-skilled labour will continuously be demanded for these advances. While the HO and SS were empirically confirmed by many empirical studies during the 1990s, SBTC was mostly recognized in the recent decades (Berman, Bound and Machin, 1998; De Laine, Laplagne, and Stone, 2000; Sasaki, and Sakura, 2005). If the SBTC dominates labour-intensive specialization, the demand for high- skilled workers should be higher than the demand for low- skilled workers.

C. Change in the movement of the factor of production and the labour market

The flows of factors of production are the key elements of the recent globalization. These flows alter the availability or the scarcity of the factors of production. There are two highlighted factors of production: labour and capital.

These days, domestic workers can be easily replaced by foreign workers. Either high skilled or low skilled workers move from their country of origin to another country with faster and cheaper transportation. Normally, high skilled workers are welcomed to the destination country. On the contrary, low-skilled migrants are less welcome, as they are possibly the reason for lower wages of the low skilled locals. The ASEAN(2008) commits free flow of highly-skilled labour as one of in five free-flow elements without any explicit commitment about the low skilled workers²

The other important factor of production is capital. An increase in capital inflows possibly enhances the demand for either high or low skilled workers, depending on the labour or capital intensive industry. The capital inflows are also believed to be the main source of technological transferring. Multinational enterprises (MNEs) are crucial actors of globalization, as they simultaneously embody the international transfer of the factor of production and intermediate goods. They are also emphasized on research and development (R&D) which benefits not only the destination countries but also the home countries (OECD, 2010). The R&D is contributed by the capital investment, especially in the country capital-shortage country. The UN (2005) highlights the success stories of domestic companies in the electronic industry in Thailand which transferred knowledge and integrated themselves into the global economy.

D. Change in domestic labour conditions and the labour market

The domestic condition of the labour market has also dynamically changed. There are two major debates: education and female participation.

Educated people normally represent the potential labour supply for high- skilled workers. An increase in educational accessibility changes the relative supply between high- and low- skilled workers. Freeman (1994) suggests that larger wage gaps between high-skilled and low-skilled workers in the United States and the United Kingdom can be explained by a reduced supply of more-educated workers in the 1980s and 1990s.

Table 3.1 shows that women's participation rates in developed countries have increased³. Chantavanich, et al (2007) inferred that cheap migrant workers help increase the educational opportunity of middle-class females because cheap workers do domestic work instead of their duties. It draws the female graduates to the labour market, not to house work.

Strikingly, male and female labour participation in developing countries is different from in developed countries. The figure shows that in developing countries, both male and female participation has declined, while the number of educated people has increased. It should be noted that the female participation rate in Southeast Asia has remained high due to the regional and historical practices. Another hypothesis which possibly explains this phenomenon is that

² The other four elements are (i) free flow of goods; (ii) free flow of services; (iii) free flow of investment; (iv) free flow of capital. One in the action plans is Develop core Competencies (concordance of skills and qualifications) for job/occupational skills required in all services sectors by 2015.

³ Given the cultural and gender-differentiated patterns of participation of each country.

job seekers with high education prefer to work in the formal sector. Highly educated graduates choose to be unemployed and wait for the possibility to access into the formal sector rather than be employed in undesirable or low wage jobs (Susangkarn, 1987).

Table 3.1 Labour Participation: Classified by Gender

Male		1980	1985	1990	1995	2000	2005	2008	Growth 1980-2008
Developed	Australia	78.5	75.9	75.7	74	72.3	72.2	72.5	-8%
	Japan	79.8	78.2	77.4	77.7	76.3	73.4	73.2	-8%
	Singapore	81.6	80.6	79.3	78.9	78.7	77.3	75.9	-7%
	UK	76	74.2	74.1	70.6	70.0	69.3	69.7	-8%
	US	77.3	76.1	75.8	74.6	74.4	72.6	72.3	-6%
Developing	China	87.5	85.9	85	84.9	83.6	80.9	79.7	-9%
	Lao P.D.R.	84.7	83.3	83	82.4	81.3	79.7	78.7	-7%
	Thailand	86.9	87.5	87	83.3	81.3	81.1	81	-7%
Female		1980	1985	1990	1995	2000	2005	2008	Growth 1980-2008
Developed	Australia	44.8	46.2	52.1	53.6	54.6	57	58.4	30%
	Japan	47.6	48.6	50.1	50	49.2	48.4	48.6	2%
	Singapore	44.7	44.9	50.7	49.7	52.3	53.5	54.2	21%
	UK	44.7	48.3	52	51.8	53.5	54.7	55.2	23%
	US	51.1	54.1	56.9	58.4	59.5	58.6	58.9	15%
Developing	China	71	71.6	73	72.3	70.9	68.5	67.5	-5%
	Lao P.D.R.	81	80.3	80.3	80.1	79.5	78.5	77.8	-4%
	Thailand	75.5	75.6	75.1	66.3	66.1	66.2	65.9	-13%

Note: Labour force participation rate is the proportion of the population ages 15 and older that is economically active: all people who supply labour for the production of goods and services during a specified period.

Indicator: Labour participation rate, male (female) (% of male(female) population ages more than 15 years old)

Source: International Labour Organization, Key Indicators of the Labour Market database.
Catalog Source: World Development Indicators

E. Institutional effects and the labour market

Under globalization, international cooperation and internationalization of business increase its significance. The larger size of Multinational firms is also weakening the unions' power (Scruggs and Lange, 2002). However, the minimum wage is set aiming to reduce wage inequality by raising wages in the lower end of the wage distribution. The minimum wage is possibly set to maintain low wages to encourage national competitiveness. The minimum wage is claimed to enhance a greater employment rate for low-skilled groups (Neumark and Wascher, 2006). Thailand also falls into this category. The economic crisis does not effect on the minimum wage setting, but the wage mechanism is intervened.

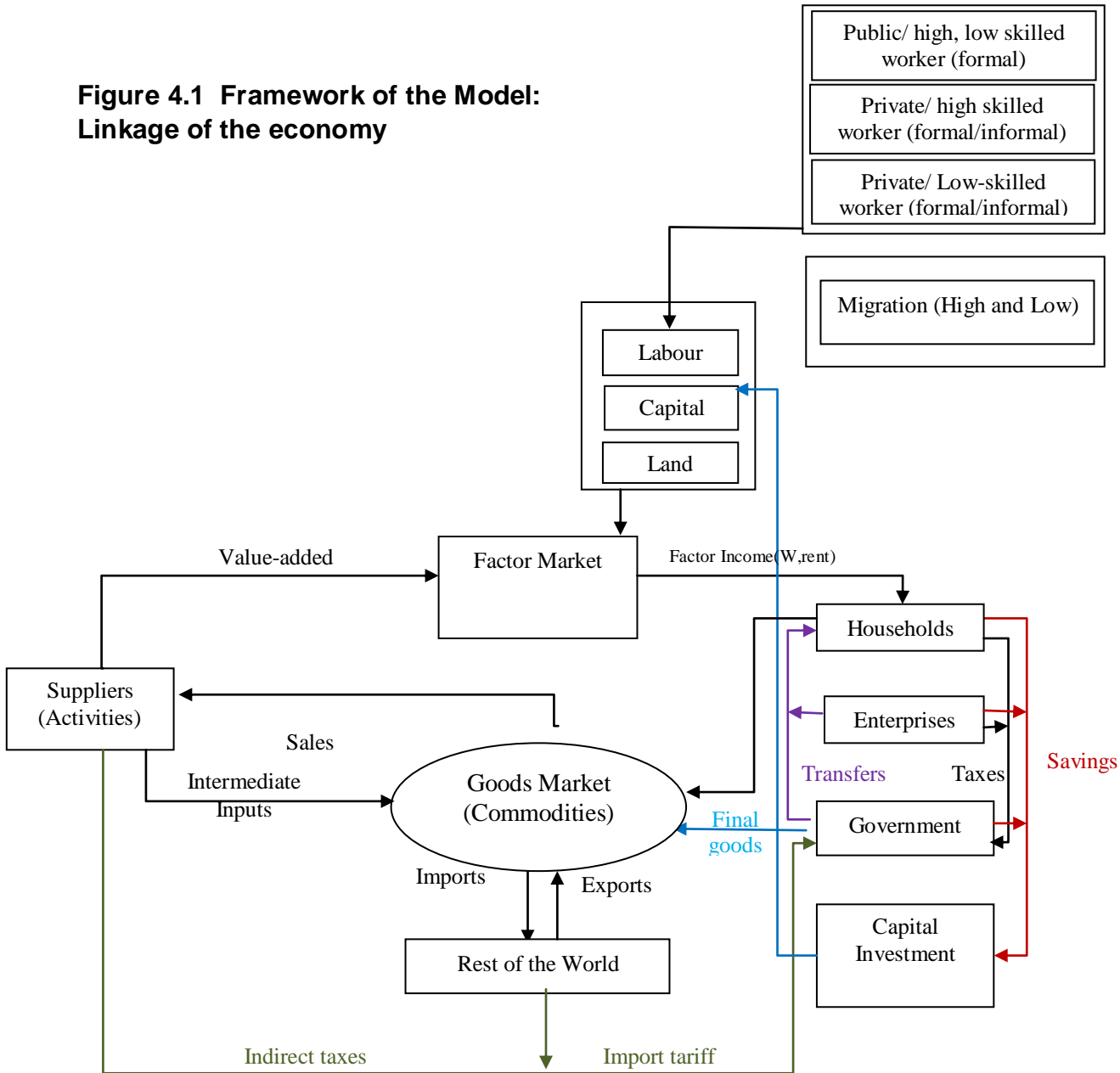
4. ANALYTICAL MODEL

This section aims to briefly demonstrate the important equations of general equilibrium applied in this study. To measure the effect of economic crisis, all proxies of economic crisis are applied in the CGE models including trade, technology of production, factors of production, domestic labor conditions, and the institutional effect. The Constant Elasticity of Substitution (CES) function performs the behavior of allocation between high and low skilled workers as well as other group of labours.

The general equilibrium is applied in this study since it simultaneously determines production, consumption, prices and international trade for all goods and services in the economy. The linkages in the economy are shown in the Figure 4.1. However, this method requires the following assumptions.

Each economic agents act rationally, such as the consumer maximize utility from consumption, firms maximizes their profit. Perfect competition prevails in each domestic industry in each country. Consumers and producers' decision based in the real prices not the nominal prices. Community preferences in consumption can be represented by a consistent set of community indifference curves. The illegal immigration is treated as the low skilled workers because most of them are elementary workers. The good market is competitive. The labor market behave monopsonistic especially, the low skilled market. The formal low-skilled worker is limited at the lower bound by the minimum wage.

**Figure 4.1 Framework of the Model:
Linkage of the economy**



To capture the impact of the economic crisis on each type of labour, the sectors of production are classified into 3 types. Those 3 sectors are (1) slow technological development (represented by the agricultural sector), (2) high technological development (represented by the industry or manufacturing sector) and (3) medium technological development (represented by the other sectors).⁴

⁴ According to the net flow of foreign direct investment classified by sector in 1970 – 2009, the proportion of industry sector (Food & sugar, Textiles, Metal & non metallic, Electrical appliances, Machinery & transport equipment, Chemicals, Petroleum products, Construction materials, Others), construction, and mining & quarrying takes about 53 percentages of the total net flow of FDI. The service sector accounts for 41 percentages, while the agricultural sector includes only 0.2 percentage of the FDI. Moreover, the trade to GDP proportion (import and export/ GDP) of agricultural, service and agriculture are 63 – 121%, 15-22%, and 7- 10% accordingly. This can be criteria to segregate into 3 sectors.

One of the contributions of this study is to classify the type of labor according to the character of labor market in the developing countries by 4 criteria. The first criterion is a main propose setting which can classified into public or private sector, which reflects the duality labor market. The later criterion is the skill set: high skilled and low skilled workers. The next criterion is the source of labors whether natives or international migrants should be selected to serve the job. Finally, the subset of the labor availability, which implies the formal, informal or registered, unregistered migrant, is the last criterion as explained in the following section.

1) **Purpose setting**

The first criterion is to classify by the purpose of the players in the economy. They are 2 major players, private sector and public sector. As can be seen in Table 2.3, it can be concluded that the employment in public sector exogenously determine without the market mechanism. Meanwhile, the business sector, mainly focusing on the profit, does not concern either the employment or wage share. In the other words, the market mechanism does not concretely relevant to the employment in the public sector.

2) **Set of Skill**

To achieve the principal objective of private sector, the demanded labor is responsively determined by the nature of work. For example, an engineering firm must set the number of high-skilled (e.g. engineers) and low skilled (e.g. laborers) workers to complete a certain work. The skill set can be determined in various dimensions. In this study, the occupation is used to classify the skill group, high and low skilled workers. They may be substitutable or complementable according to each sector.

3) **Set of Labor Available**

The type of labor is judged by the above set of skilled needed to accomplish a certain work. If we assumed the ability of locals and migrants are similar and substitutable to each others, the employers' decision to use the different source of workers is indifferent. However, the migrant laws and the labor laws are important in the number of workers. It is worth to briefly discuss about the Thai history to shed the light on availability of workers in the economy.

In Thailand, the migration issue become on the hot debate in the 1990s, because of the significant number of immigration during the economic boom. Like other countries, high proportion of migrants enters Thailand illegally, which causes the ambiguous number of the actual total migrants. The Thai government began to impose a migrant levy and an amnesty and registration of the illegal migrant.

Since the number of migrants usually concurs with the geo-political factors, as well as ethnic diversity and historical experience of migrant labor. (Athukorala and Manning, 1999:23). Inflows of low-skilled workers to the Thai Economy: the migrants normally come from Myanmar, Cambodian, Laotian, Chinese (Yunnan) and South Asian. The neighboring countries with lower incomes have immigrated into Thailand; the attractiveness fulfilled by the higher gap of income comparing to the neighbor's income. The internally and chronically

political conflict and economic stagnant in Myanmar is also an important driven factor for cross-border migrants from Myanmar to Thailand.

The concerns about the migrant workers were occasionally mentioned in the early of 1990s, yet it did not effective. For example, in September 1996, Thai government announced a three month registration program and an amnesty for all illegal migrants. It was not an effective measure; there were only a tiny number of illegal migrant to register. (Athukorala and Manning, 1999: 192-193). The government implemented this voluntary measurement due to the difficulty to catch illegal migrants. Unsurprisingly, the migrant workers as well as the employers feel indifferent in legal registration. Most of the immigrant workers were in the rural area; therefore, it was easily and possibly to hide from the scrutiny of government official.

After the economic crisis in 1998, a number of locals become unemployed. The stricter regulation, thus, imposed. The ministry of the Interior imposed the long jail sentence for smuggling illegal workers into Thailand. The duration of work permits, which use to be a several years permitted, was reduced to be an annually work permit.

Currently, the main purposes of Working of Alien Acts are to employ aliens in case of bringing about a large amount of foreign currencies for investment or expenses in the Kingdom, and to generate employment of Thai nationals in a large number. The alien employment is also allowed to the case where modern and advanced technology is required to bring about technology transfer or skill development to Thai nationals. In the practices, the high skilled workers are easily obtained the work permit, if their occupations do not the restricted occupations under the laws. The employment or sub-contraction of foreign firms also offers the opportunities for all high skilled workers

The recent law is also allowed to hire the aliens in the small enterprises or individual unit. The employment of foreigners is applicable for the employers, whose business generates income or paid tax in the past or present year. Yet, a work permit will be issued to an alien for every four Thai workers but the total number of aliens to be granted work permit shall not be more than three. Owing to the hardship to catch, many undocumented migrants, working in the low skilled occupation, still exist in the Thai economy. They are mostly suffered by various problems including bribery, losing of property, deception by brokers, debt⁵ to pay for broker and bribery, physical and sexual abuse especially women and girls, arrest and confinement by the officer in the origin and destination country, accident, injury and death during the journey.

It is also argue that the removal of all foreign workers from Thailand would reduce total GDP by around 0.5 percent annually. The wage of unskilled workers would increase to 4 percent and drop in the high skilled wages about 4 percent as well (Sussangkarn, 1996). Migrant workers play a significant role during the industrialized transition. On the other hand, the migrant workers are slower down the wage of the unskilled workers. In political concerns, they are also claimed to responsible for exacerbating the worst ills of society; for example, crime, prostitution, epidemic illness.

⁵ The broker charges Myanmar to entering Thailand is ranked between 3,000 to over 24,000 baht depending on the route distance (Chantavanich et al., 2007)

The immigrant workers normally send money back to home. According to a survey made by Chantavanich et al (2007) in 1996 reported that the 249 migrants in Mae Sai sent the money to homeland approximately 2,282 baht per person per year, or estimated at about 80 million baht per year. Another sampling province is Mae Sot with 292 samplings and remittance at about 5,656 baht per year, or about 200 million baht per year.

4) Sub-set of the Labour Available

This section is to classify the subset of the labour available as classified into locals and migrants. These two groups are also disaggregated into various types due to the different behavior of wage gain. The locals are composed of formal and informal employment, while the migrants are registered and unregistered workers.

(1) Formal an informal workers

Over 30 years, according to the labor force survey, the informal employment declines in every sector except one sector, the high skilled worker in the agricultural sector. For the whole economy, the share of informal to formal workers is about 0.75 in the late 1980s to 0.61 in the current situation. However, the number of informal high skill workers in this sector is swiftly changing, which may reflect the inconsistency of the data or the special characteristic due to the very flexibility of the market.

It should be noted that all developing countries share this decreasing trend. But the developed countries, especially the female, conversely increase in the form of part-time jobs. For example, in Japan the economic recession also fosters this phenomenon. The employer-initiated reductions in standard working hours for full-time workers which increased numbers of involuntary part-time workers were employed (OECD, 2010). However, due to the data from Socio Economic Survey, the mean wage of informal worker is lower than the formal one in any skilled group.

A number of studies, for example Enlinson and Laudo (2009), and Sussangkarn (1987) suggest that the formal and informal workers have different non-wage characteristics. Particularly, in Thailand, Sussangkarn (1987) using the bivariate probit estimate the indicator function or whether an individual gets into the formal sector. The study found that a male with better education, situated in Bangkok, and not a new domestic migrant to the area is likely to be found in the formal sector. The jobs are horizontally differentiated so that workers have heterogeneous characteristics. It implies that the labor supply is imperfect elastic.

The following sections attempt to explain the behavior of formal and informal employment of each skill.

- High skill

The formal employment of highly skilled workers bases on the negotiable condition. The market environment reflects their wages. The workers in this group are normally the highly skilled workers with highly collective bargaining.

The informal workers who work informally are mostly voluntary to do⁶. They argue that the formal work may require working conditions that does not match the workers' preference or their families' preference; therefore they do not tend to involve in the formal employment. Some jobs are naturally required the informal employment. Some family businesses, yet, need their qualified descendents to continue their business. The occupations in this category are, for instance, freelances, the web masters, visiting instructors, specialists, novel writers. The workers in this category gain income on the market wage due to their ability with negotiable wage. Even though their return is lower than the formal one, the working condition is much more flexible. We can interpret as the different worker's preference between income and leisure of the formal and informal worker.

- Low skill

The low skilled workers are mostly embodied with the low negotiation power. In the other words, the employer has the higher power to determine their wages. Therefore, the analysis on this type of labor must base on the monopsonistic principal. The models concerning the monopsony are firstly demonstrated, and then the Thai labor market in this skilled category is explored.

A directly government intervention on labor markets is to set minimum wage for the whole economy. It aims to reduce wage inequality by raising wages in the lower end of the wage distribution. It was found that the minimum wages benefited a greater employment rate for the low-skilled groups (Machin and Manning, 1992; Neumark and Wascher, 2006).

In Thailand, the low skill workers, who are formally employed, are automatically obliged to the minimum wage. It is empirically suggested by a survey⁷ that at the beginning of the work, they gain wage at the minimum wages set by the government. The wage may increase overtime with the worker's experiences; nevertheless, the increase of the wage does not significantly different. The wages of low skilled worker are naturally different in each sector.

Thai government has obligated to the minimum wage setting since 1973 at 12 Baht per day in the Bangkok and metropolitan area. Before 1963, the labor unions have been existed. Yet, the objective did not concern to the wage negotiation.⁸ A tripartite panel was formed comprising representatives from the government sector, employees and employers. The laws excluded employment in agricultural sector and self employed. In 1976, an amendment redefined minimum wage only to be suffice for the employed person only in order to reduce the burden of entrepreneurs and create equality between labor factions.

During the late 1970s to the late 2000s, the minimum wages in Thailand representing the principal wages for low-skilled workers had increased from 90.8 Baht to 153.6 Baht in nominal

⁶ From interviews: 2010

⁷ TDRI (2008) SME in Thailand. It is noteworthy that the worker in this category decides to work because of the difference of overtime payment.

⁸ In 1897, the first labor union was registered by Tram Worker Association with 200 members. It was established 'to let members help each other and to receive welfare. Nantapun, Chainan (1983) :79

value. While, the real wage (weighted the nominal value by the headline consumer price index) had a decreasing rate of real returns from 90.8 in 1991 to 89.15 in 2006. The drop of real value noticeably appeared since the economic crisis in the late 1990s.

The informal workers, yet their willingness is, in fact, desire to work formally. The workers in this type have no or less collective bargaining than that of employers. In addition, they are excluded from the minimum wage laws. This group is, mostly the poor. The occupations in this group are, for example, domestic workers, home artisan workers, sales and services elementary occupations, agricultural laborers. Therefore, the employers mostly occupy the bargaining power to manipulate their employee's income and benefits. (Not only are the Thai poor, but also migrant workers in this category.) They are normally suffered in the poor working condition.

2) **Registered and unregistered migrants**

The foreign workers can be classified into two main types: registered (legal) and unregistered(illegal) migrants. Note that there are both inflow and outflow labor. The number of low-skilled immigrant workers (both documented and undocumented workers) is estimated at about one million workers. Note that this study will not emphasize on the number of emigrant because the analytical framework focuses on the existing labor in the economy.

There are wage gaps between foreigners and locals of high skilled and low skilled workers. It was found by Voon and Miller (2005) that in 1996, controlling individual factors for example, education, experience, and gender, the migrants from English-speaking countries earn about 4% more than local born workers. In contrast, migrants from non-English-speaking countries earn about 9- 12% less than comparable Australian-born. It is commonly acknowledged that the immigrants from English-speaking countries mainly work in the high skilled occupations, while those from non-english speaking counties are normally work in the low skilled jobs. This phenomenon is also found in Germany (OECD, 2005).

For migrant workers in Thailand, the market behavior is completely different between high skilled and low skilled workers.

(1) High skill

The high skilled migrants are easily to obtain the work permit, if they comply with the Working of Alien Acts. The coverage of the work permit for foreigner is quite broad. Even though the main purposes of Working of Alien Acts are to employ aliens in case of bringing about a large amount of foreign currencies for investment or expenses in the Kingdom, and to generate employment of Thai nationals in a large number. The amount of investment is stipulated at only three-million Baht investment per person (at about 100,000 USD based on the exchange rate in January 2011), and a number of exemption facilitate the high skilled migrants to work in the country.

(2) Low skill

The migrants compose of registered and unregistered (illegal) persons⁹. The actual total number of migrants is impossible to count. Chantavanich, et al (2007) suggest that in 1996, the official estimation of the overall foreign population is about 1.5-2 million. This number is normally mentioned in the current literatures and interviews.

The private sector demand for cheap labor for their production line, but local Thais were not interested in the unskilled labor market due to the extension of basic education to secondary schools and their preference to work in the service sector (Chantavanich et al., 2007: 42). The firms which employ low skilled locals face the very high turnover rate. Some firms decide to partially hire the immigrant workers, especially from Union of Myanmar and Laos.

The majority of the migrant worker is found in the agricultural sector, followed by domestic work and construction. The rest disperse in the fishery and fish processing, rice mill, ice making, mining, transportation and others. Most migrant workers were normally registered along their national and Thai border; for example, Burmese migrant workers were registered along Thai- Myanmar border.

As discussed in the previous section, the work permit is necessary to work in Thailand. One with a work permit is under the fair laws to the locals, including minimum wage, Labor Protection Acts. Their working conditions are quite equivalent to the formal employees of locals.

Yet, the unregistered and low skilled migrants are suffered from the poor working conditions. Most of them gains wage less than half of Thais working as can be seen in the Table 4.1. Some of their employers seize their ID to prevent them to escape. Some do not receive the wage as agreement and they can do nothing to the employers (Chantavanich, et al: 2007). However, the unregistered workers are continuous increase since the minimum wage in Thailand is still higher than those in their countries; for instance, 3-5 times to Lao's minimum wage and close to their countries.¹⁰

⁹ There are 2 official checkpoint to Thailand; permanent international checkpoint (eg. Mae Sai, Chiang Rai province), and trade-check point (eg. Muang district, Mae Sarieng in Mae Hong Son province). The illegally entering migrant may enter across the river, sea, local pier, mountain border by foot or other vehicles. They are also trafficking by trunks.

¹⁰ Minimum wages. (11,154 Lao kip a day for private sector workers) (ranges from 148 Thai baht to 203 baht per day) Given 0.0039 Baht per 1 Lao kip. Available online: http://en.wikipedia.org/wiki/List_of_minimum_wages_by_country

Table 4.1 Monthly Wages of Thai, Registered and Unregistered Migrant Workers: 2001 - 2005

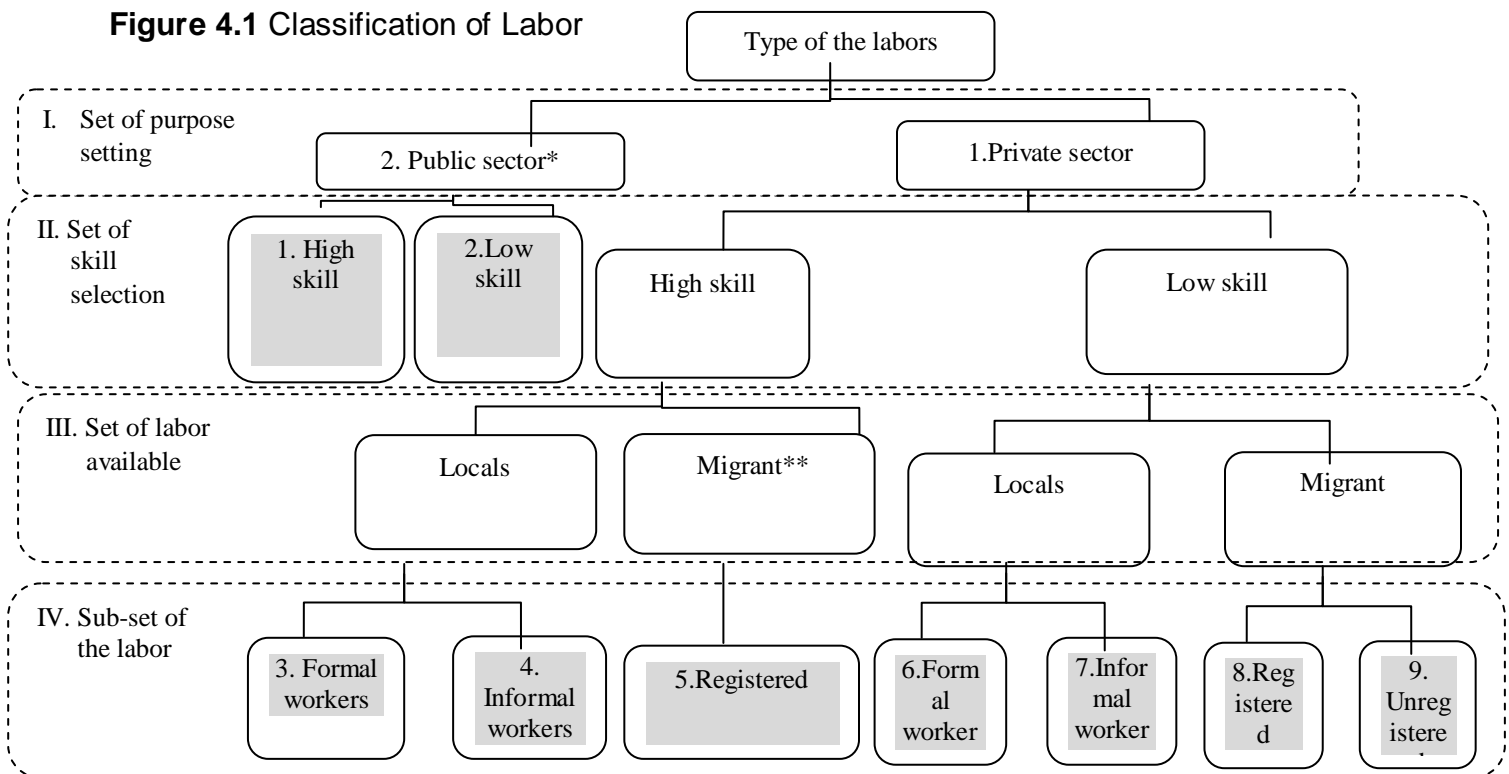
Sector	Thai worker	Registered Migrant	Unregistered Migrant
Agriculture	3,000 – 4,500	3,000 – 4,000	1,000 – 1,500
Construction	3,000 – 6,000*	4,500 – 6,000	3,300
Domestic work	5,900 – 7,000	1,000- 4,000	700-1,000
Entertainment sector and sex industry	-	-	5,000 - 10,000
Factory	5,500**	3,000 and higher	1,000-3,000
Fishery	10,000	3,000 – 4,500	2,800 – 3,900
Fishery and related work	5,000 – 6,000**	3,000 -4,500**	2,800 – 3,900
General labor	4,300-5,000	1,000-5,000	600 – 3,000

Source Chantavanich et al., 2007: 27. Table 3.1 . He compiled from various sources. Overall data is from ARCM' collected information. * Mahavirawat, et al.** Advance Global Business 2004, ***Ministry of Labour, 2004.

Sex workers, which is illegal in Thailand, can gain 8,000-20,000 baht per month (Chantavanich et al, 2007: 39)

As can be seen in the Figure 2.4 depicts the criteria and the type of labor.

Figure 4.1 Classification of Labor



Note: * There are some foreign workers directly hired by Thai government. Most of them are consultants or specialists. However, there are only a few; less than 0.001 percent of total workforce. This group, therefore, is considered insignificant.

** High skilled workers are assumed to be firstly hired by an existing firm in Thailand. Thus, there is no unregistered (or illegal) worker in this group.

The following subsection aims to provide the highlighted sets of models in the general equilibrium.

4.1 Production

All firms evolve in a competitive environment and maximize profits to determine output supply and factor demands. This study applied the assumption that both high skilled and low skilled workers and the capital are determined by the translog production function. Though, there are various functional forms for production function, this function is relatively flexible. It does not impose the constant elasticity of production and substitution between inputs. This aspect is a great debate in the production function more than 2 inputs, since the elasticity of substitution between different pair of inputs should not be the exactly equal.

$$\ln Y_i = \alpha_0 + \sum_1^i \alpha_i \ln x_i + \frac{1}{2} \sum \sum \alpha_{ij} (\ln x_i \ln x_j) + z_i + \varepsilon \quad (4.1)$$

z_i donates the other factor affecting the production function. x_i stands for the input factor in sector i . The inverse demand for input is defined by its share. The input demand for each sector is derived from the profit maximization as the following equation.

$$\pi(W_{Min}, W_H, R, M, Y) = P_Y(Y)Y - C(W_{Min}, W_H, R, P_M, Y); Y = F(L, H, K, M, Y) \quad (4.2)$$

H and L stands for high and low skilled workers, K represents for capital, M is the net migrant workers and Y is the output. Note that the high and low skilled locals are classified into formal and informal employment, which related in the CES function. There is no limitation in the high skilled migrant, since the law in Thailand allows high skilled migrants to urge for the license easily. Yet, the number of low skilled migrants is legally set by the government. The comprehensive discussion about the models concerning labours performs in the section 4.4.

The price of good is equal to marginal cost and mark up price: $P(Y) = \nu C_Y(P_{X^1}, \dots, P_{X^n}, Y)$. If the production function is homothetic of degree, the following restriction is imposed.

$$\sum \alpha_i = \theta, \sum \alpha_{ij} = 0 \quad (4.3)$$

The price of input equals to the partial differentiation with respect to input multiplied by a Lagrangian multiplier.

$$Px_i = \lambda f_{x_i} \quad (4.4)$$

By multiplying input x_i to both sides, the parameter λ represents the share of the cost to the inputs.

$$\lambda = \frac{C}{\sum fx} = \frac{C}{F\theta} \quad (4.5)$$

Then, the cost distribution ratio or the demand equation for each factor of production is yielded as the equation (4.6).

$$S_{i,s} = \frac{1}{\theta} \left[\alpha_{i,s} + \sum \alpha_{ij} \ln x_{j,s} \right] \quad (4.6)$$

Where z_i represents other variables i.e. dummy variable before and after economic crisis in 1997, the ratio of the high education to the lower one, the number of migrant workers.

The aggregate of material inputs is obtained with a Leontief technology.

$$\sum Y_i P^{d_i} \quad (4.7)$$

Where Y_i = Domestic sales of composite commodity, PD_{ij} = sales prices of composite commodity. The quantity of aggregate intermediate input per activities unit. The firms must maximize its profit and must choose to sell in the domestic or the foreign market. The transformation function exhibits in the constant elasticity of transformation in (4.8).

$$Y_i^d = a_{T_i} \left[\delta_{T_i} E_i^{-\rho_{T_i}} + (1 - \delta_{T_i}) Y_i^{dd-\rho_{T_i}} \right]^{\frac{-1}{-\rho_{T_i}}} \quad (4.8)$$

Where Y_i^d = supply of domestic output of firms, Y_i^{dd} = quantity of aggregate value added or the domestic output of firms, E_i = quantity of aggregate intermediate input. a_{T_i} = shift parameter in the CET function of firm. Assume the constant return to scale (homogeneity), therefore

$$\delta_{T_i} = \frac{1}{1 + \rho_{T_i}} \quad Y_i^{dd} = (1 - \delta_{T_i})^{\sigma_{T_i}} P_i^{dd-\sigma_{T_i}} \left[\delta_{T_i}^{\sigma_{T_i}} P^{E^{1-\sigma_{T_i}}} + (1 - \delta_{T_i}) P^{DD^{1-\rho_{T_i}}} \right]^{\frac{\sigma_{T_i}}{1-\sigma_{T_i}}} \left(\frac{Y_i^d}{a_{T_i}} \right) \quad (4.9)$$

$$E_i = \delta_{T_i}^{\sigma_{T_i}} P_i^{E^{1-\sigma_{T_i}}} \left[\delta_{T_i}^{\sigma_{T_i}} P^{E^{1-\sigma_{T_i}}} + (1 - \delta_{T_i}) P^{DD^{1-\rho_{T_i}}} \right]^{\frac{\sigma_{T_i}}{1-\sigma_{T_i}}} \left(\frac{Y_i^d}{a_{T_i}} \right) \quad (4.10)$$

Where Y_i^{dd} = Domestic production delivered to the home market (includes the transportation), P_i^{dd} = Price of domestic production delivered to the home market quantity of aggregate value added or the domestic output of firms, E_i = quantity of aggregate intermediate input, and P_i^E = Price of product exported. δ_{T_i} = elasticity of transformation.

Armington assumption, the firm produces a composite commodity using the domestic commodity supplied to the domestic market and imports of this commodity, is shown in the equation 4.10. The firm must minimize its total cost of the domestic commodity and import goods (M_i).

$$TC_i = P^M M_i + P^{DD} Y^{DD} \quad (4.11)$$

Subject to

$$X_i = a_{A_i} \left[M_i^{-\rho_{A_i}} + (1 - \gamma_{A_i}) X^{DD} \right]^{-\frac{1}{\rho_{A_i}}} \quad (4.12)$$

Given σ_{A_i} is the elasticity of Armington function

$$M_i = \gamma_{A_i}^{\sigma_{A_i}} P^{M-\sigma_{A_i}} \left[P_i^{\sigma_{A_i}} P_i^{M^{1-\sigma_{A_i}}} + (1 - \gamma_{A_i})^{\sigma_{A_i}} P_i^{DD^{1-\sigma_{A_i}}} \right]^{-\frac{\sigma_{A_i}}{1-\sigma_{A_i}}} \left(\frac{X_i}{a_{A_i}} \right) \quad (4.13)$$

$$X^{DD} = (1 - \gamma_{A_i})^{\sigma_{A_i}} P^{DD-\sigma_{A_i}} \left[P_i^{\sigma_{A_i}} P_i^{M^{1-\sigma_{A_i}}} + (1 - \gamma_{A_i})^{\sigma_{A_i}} P_i^{DD^{1-\sigma_{A_i}}} \right]^{-\frac{\sigma_{A_i}}{1-\sigma_{A_i}}} \left(\frac{X_i}{a_{A_i}} \right) \quad (4.14)$$

Where X^{DD} = Domestic production delivered to the home market (includes the transportation), P_i^{DD} = Price of domestic production delivered to the home market quantity of aggregate value added or the domestic output of firms, M_i = the import delivered to the home market, and the P^M = the import price.

Note that the public commodities produced by the transportation sector, tourism sector, and the public utility are assume to be non-cross border trade. Even some public utilities, especially the power generator, are produced and trade among the neighboring countries, the present amount as the GDP ratio is small enough to neglect. Therefore, there is no decision making to exports. On the other hand, for sector not importing from the other economies, total supply is equals total domestic sales.

4.2 Demand for Goods and Services of Household

The household receives income from primary factors' remuneration, transfers from the government and from the rest of the world. A fix portion of its income is used to pay income taxes to the government and its savings are a linear function of its disposable income.

On the other hand, the household's money income from capital, labour unemployment benefit, transfer funds from government (TR_G) for training and educational subsidies and the transfer from the rest of the world (TR_F) and other transfers (TR_D).

$$Y^H = P^K \cdot K + P^L (LS - UNE) + TR_G + ER \cdot TR_F + TR_D \quad (4.15)$$

Where Y^H represents the household's income. LS is the total labour supply . Given saving is a fixed fraction of net money income. ER = exchange rate.

The model assumes that the preferences of the representative household are represented by a Stone-Geary utility function (or Linear Expenditure System). Each household maximize its utility subject to his budget.

$$U = \prod_{i=1}^n (c_i - \mu H_i)^{\alpha_{HLES_i}} \quad (4.16)$$

Subject to

$$C^{Bud} = \sum_{i=1}^n (1 - t_{c_i}) P^{D_i} C_i \quad (4.17)$$

Where C_i = consumer demand for commodities. μH_i is the minimum expenditure on the commodity i . μH_i can be interpreted as the minimum required quantity. α_{HLES_i} is the marginal budget share. t_{c_i} is tax of goods C_i . The Frisch parameter (ϕ) can be given by:

$$\phi = - \frac{C^{Bud}}{C^{Bud} - \sum_{i=1}^n (1 + t_{c_i}) P^{D_i} \mu H_i} \quad (4.18)$$

$$\mu H_i = C_i + \alpha_{HLES_i} \left[(1 + t_{c_i}) P^{D_i} \right]^{-1} C^{Bud} \cdot \phi^{-1} \quad (4.19)$$

4.3 Government

Government's expenditures for each good are fixed in real terms. Its other expenses consist of transfers to households and net transfers to the rest of the world. Its income comes from taxes on international trade and taxes on the remuneration of primary factors, taxes on imports consist of tariffs and other taxes, and taxes on financial units.

$$Y^G = t^{direct} + t^{Indirect} + ER_i \cdot TR_F + t^{Finan} \quad (4.20)$$

Where Y^G = the government income, t^{direct} = direct tax, $t^{Indirect}$ = indirect tax, and $ER_i \cdot TR_F$ = exchange rate multiplied by the transfer from the rest of the world t^{Finan} = taxes on financial units.

The Laspeyres consumer index is applied (PCINDEX). The government pays unemployment benefits and other transfers by the replacement rate in the nominal term. C_i^0 is the consumer demand for commodities at the time 0, $P^{D_i^1}$ is the price of goods at time 1 for goods i , and $P^{D_i^0}$ is the price of goods at time 0 for goods i .

$$PCINDEX^t = \frac{\sum_{i=1}^n (1 + t^{c_i^0}) P^{D_i^1} C_i^0}{\sum_{i=1}^n (1 + t^{c_i^0}) P^{D_i^0} C_i^0} \quad t=0,1 \quad (4.21)$$

4.4 Labour market

Labour is measured in efficiency units. First of all, it is important to emphasize that the workers are heterogeneous. Suppose that a representative worker embodied with the following utility function as equation (4.22).

$$U = I^\alpha Le^{1-\alpha} \quad (4.22)$$

Where I is money income or the worker's consumption, Le is the utility that the worker get leisure. α is the worker's preferences between income and leisure of each individual. Note that focusing on the heterogeneity of firms and workers, the informality arises in a model with heterogeneous profit maximizing firms to choose between formal and informal business. The advantage of the formal over informal businesses is the capital accessibility. Rawiwong et al(2009) reports a survey with 1,000 informal workers in Thailand. It is found that the first severe occupational problem is the financial shortage. It should be noted that this aspect is also emphasized by To(2008) about the different ability to adjust the capital requirement. He assumes that the formal enterprises have a fixed production cost of capital, while the informal employer's capital requirements are much more flexible and they have constant fixed production cost.

On the employer side, suppose employers the equation (4.23) represents the formal sector. The marginal revenue products of formal and informal worker are denoted by ϕ_i and ϕ_f . t_f is the tax that the informal employment must pay. The employer in the formal sector and informal sector maximizes its profits as the equation (4.23).

$$\pi_f = l_f \phi_f - l_f w_f (1 + t_f) \quad (4.23)$$

Since the employer in the formal sector tends to hire the formal employer, yet they have to pay taxes. Even though the formal sector employs the high skilled migrant workers only registered one. On the other hand, the informal sector tends to hire the informal worker as well as unregistered migrant. The unregistered migrant does not have to pay tax, but they have to pay for the working permit, and must pay for a fine if they get caught. It is worth to note that since this study assumes that the productivity of the locals or migrants does not differ, the registered migrants are equally treated as the formal locals. The unregistered migrants are considered as the informal locals, yet they have the chance to get caught. I apply Θ to represent the chance to be caught and break the rules. It can reflect the level of law enforcement. The higher level of law enforcement escalates the probability to be caught. $1 > \Theta \geq 0$. It can also imply the hardship to work in Thailand.

$$\pi_i = l_i \phi_i - l_i w_i - l_m^{un} w_m (1 + \Theta) \quad (4.24)$$

Since the productivity of the local and migrant is assumed to be the same, it implies a relationship between unregistered migrants and informal worker as (4.25). It is worth to note that

$$1 + \Theta = \frac{l_i}{l_m^{un}} \quad \text{or} \quad \Theta = \frac{l_i - l_m^{un}}{l_m^{un}} \quad (4.25)$$

If the Θ is low or close to 0, the labor allocation must be equally arranged ($l_i = l_m^{un}$). If the probability to be caught is smaller than paying tax ($\Theta < t_i$) and the marginal revenue products of formal and informal worker is identical ($\phi_f = \phi_i$).

Employer's first order conditions then yield the equilibrium wages as of the formal worker, the informal worker, and the unregistered migrant workers as (4.26)- (4.28). Note again the registered migrant high-skilled workers are treated as the formal workers. Assume that the ρ is different between high and low skilled worker.

$$w_f^* = \phi_f / (1 + t_f) \rho_f^k \quad (4.26)$$

$$w_i^* = \phi_i / \rho_i^k \quad (4.27)$$

$$w_m^{un*} = \phi_i / \rho_m^L (1 + \Theta) \quad (4.28)$$

While $k = H, L$. Since $\Theta \geq 0$, the equilibrium wage of informal workers then greater or at least equal to wage of unregistered migrant worker ($w_i^* \geq w_m^{un*}$). The employment level is then given by (4.29).

$$l_f^H = \alpha^H \left(w_f^* \right)^{\frac{1}{\rho_f^H - 1}} \left((n_f^H + n_m^H) (w_f^H + n_m^H)_i \left(\frac{\rho_f^H}{\rho_f^H - 1} \right)^* + n_i^H w_i^H \left(\frac{\rho_i^H}{\rho_i^H - 1} \right)^* \right)^{-\frac{1}{\rho}} \quad (4.29)$$

Under the minimum wage set by the government, if the minimum wage (w_{min}) is lower than or at least equal to the w_f^* , the employment level with the minimum wage is then can be substituted l_{min} into l_f^* , and w_{min} into w_f^* . Since only low skilled workers enjoys the benefit of the

$$l_f^L = \alpha^L \left(w_{min}^* \right)^{\frac{1}{\rho_f^{min} - 1}} \left(n_f w_{min}^{\frac{\rho_f^{min}}{\rho_f^{min} - 1}} + n_i w_i^{\frac{\rho_i}{\rho_i - 1}} + n_m^{un} w_m^{\frac{\rho_m}{\rho_m - 1}} \right)^{-\frac{1}{\rho}} \quad (4.30)$$

The minimum wages then not only effect on the employment of formal workers, but also other types of workers. If the wage is set by the monopsonistic employer (or government), the number of employment then adjust to it equilibrium. It should be noted that the minimum wage is set by the government for all sectors, which have various number of marginal revenue products ($w_f^* > w_{min} \geq 0$), therefore it is possible to vary among sectors. I

The Philips curve is applied to find the relationship between the rate of change in real gross wage rate and the unemployment.

$$\frac{P_L^1/P_{INDEX^1}}{P_L^0/P_{INDEX^0}} - 1 = phillips \left(\frac{UNE^1/LS^1}{UNE^0/LS^0} - 1 \right) \quad (4.31)$$

0= benchmark, 1= proposed change

Note that Puzon (2009) found that the marginal effect of the employment to the inflation rate during 2001 – 2006 of Thailand is -0.94 at more than 10 percent significance. It implies that the one unit change in unemployment effects on the inflation rate at about 0.94 unit. Then, in this study, the phillips is set as 0.94.

For high-skilled workers, the employment level is always determined by firms and plays on the competitive market. Yet for the low-skilled workers, the wage is set in the nominal rigid regime by binding the minimum wage($W_L^D \geq W_L^M$)

The binding of the minimum wage exits only in the low skilled and formal labour. The low skilled and informal workers will be bound between the sustainable wage and the minimum wage as shown in equation 4.32.

$$\mu H \geq W_L^{In} \geq W_L^M \quad (4.32)$$

4.5 The rest of the world

Thailand is the price taker in the world economy. The exchange rate is fixed leaving the trade balance to be determined endogenously.

$$\text{The import price in Baht is } P^{M_i} = (1 - t^{m_i}) ER \cdot P^{WM_i} \quad (4.33)$$

$$\text{The export price in Baht is } P^{E_i} = ER \cdot P^{WE_i} \quad (4.34)$$

$$\text{The balance of payments is defined as } \sum P^{WM_i} \cdot M_i = \sum P^{WE_i} \cdot E_i + S_i^H + S_i^G + S_i^F \quad (4.35)$$

Where P^{WE_i} and P^{WM_i} =World market price of exports and imports. S_i^H, S_i^G and S_i^F represent saving of household, government and financial sector.

This section provides the framework of the study and the highlighted models in this study. The results are demonstrated and discuss in the following section.

5. RESULT OF THE STUDY:IMPACT OF ECONOMIC GLOBALIZATION ON THE EMPLOYMENT

This section presents the results of the framework of the study in section III and IV. The impacts of economic crisis on the employment are measured. The estimated result is compared to the based case (before the economic crisis) to provide comprehensive change of economic globalization on the employment.

As can be seen in the Table 5.1, the low skilled worker of the manufacturing sector in Thailand has severely suffered from the economic crisis by the reduction in employment at about 14

percent. Since manufacturing firms are exporting companies, it supports the hypothesis that the lower demand of the main importers in the Western Continent unarguably reduces the demand for goods.

However, the data in Table 2.1-2.3 implies that the fall in the Thai employment is only temporary, and the informal sector, especially in the agricultural sector, is the essential absorber against the unemployment problem.

The low skilled informal workers are assumed substitutable to both unregistered and registered migrants. The wages of low skilled migrants are cheaper than the formal locals, the intention to employ the low skilled migrant has increased, yet it is limited by the legal quota of work permit.

Table 5.1 Estimated Impact of Economic Crisis on the Employment in Thai Economy: Compare to the Based Case

	Impact of the economic crisis on the growth of employment	Agriculture		Manufacturing		Services	
		High skill	Low skill	High skill	Low skill	High skill	Low skill
Domestic s	Formal	-0.5	+2.1	-0.1	-14.3	-1.2	-8.3
	Informal	-0.1	+4.8	+0.3	-3.1	-0.4	+1.1
Migrants	Formal* (Registered)	+0.2	-0.5	+1.4	-0.1	+3.1	-1.1
	Informal (Unregistered, low skilled only)**	-	+0.1	-	-0.1	-	+0.1

Note: *The high skilled migrants are assumed to easily obtain the work permit and more welcomed than

the low skilled migrants. Thus, the high skilled migrant worker automatically implies the formal employment.

** The unregistered low-skilled migrants or illegal migrant workers are estimated at about 1.5- 2 millions Chantavanich, et al (2007). Note that according to the definition there is no high skilled worker in this category.

The government attempts to increase its employment in substitute for the fall in the employment by private sector. The constant rate of increase in the public employment has substantially increased. The planned employment by public sector has enlarged together with the fiscal stimulus plan, so called “Thai Khem Kaeng” (ไทย เข้มแข็ง, Strong Thailand). It helps relieve the unemployment problem in the long run.

The short run adjustment in employment is also found in Vietnam. The Vietnamese government has supported the small and medium enterprises (SME). An unemployment insurance scheme, financial assistance, has been launched on January 1, 2009. Vietnamese workers who signed contracts of at least one year with foreign, government or individual companies will be eligible for unemployment insurance, accounting for 60 percent of the average salary of the employee. Additionally, on February 24, 2009, the Vietnamese government decided to provide interest-free loans to enterprises for paying salaries, social insurances and unemployment subsidies for their workers. (Thi Thuy Van, 2009)

However, the migrant worker within the Southeast Asia possibly returns to their homeland. UN Country Team (2009) in Cambodia notes that there is a high risk that laid-off workers from garment factories, construction sites and tourism-related industries return to their home villages putting pressure on agricultural resources. In addition, approximately 200,000 migrant workers, mostly in Thailand and Malaysia, are likely to return to Cambodia. This development would put even greater pressure on already crowded farmland and fishing boats. However, the situation harmonizes to Thailand. The financial and economic crisis in the Southeast Asia positively impact on the export sector. The similarity of the situation of the worst sector as well as the adjustment reflects the similar situation in Thailand.

6. CONCLUSION AND POLICY IMPLICATIONS

The concern of the effect of economic crisis in the Western world relates to a possible raise in returning migration from the developed country and the unemployment in the developing countries where mainly export goods to those countries. Therefore, the study aims to estimate the effect of economic crisis in the Western Continent on countries in Mainland Southeast Asia using Thailand as a representative. Since Thailand shares the common features in economic environment, particularly Cambodia and Vietnam. The study represents the case of small country, export in manufacturing goods, and being the net FDI receivers. Moreover, the majority of employment is informal in the agricultural sector.

The analytical framework of this study is Computable General Equilibrium Models (CGE) with imperfect labour market conditions, including the minimum wage and the informal sector. The Difference in Difference method is applied to evaluate the real effects of economic crisis on the employment. It also attempts to measure the impact of the crisis on the employment of registered and unregistered immigrants. The contribution of this study is to evaluate all proxies representing the economic crisis simultaneously, which actually happens in the economic crisis of the decades of globalization. It is contrary to the partial equilibrium analysis which focuses on the effect of each proxy on the employment. Moreover, this framework provides the possibility to classify the effects on various groups of labour.

The economic crisis is regarded as the external impact. It is carefully measured though the global linkages, including the decrease in the trade volume, the reduction of capital inflows from the West, changing in technology and the dynamic of migrant workers. The domestic labor conditions, including an increase in high graduates and female participation in the labor force, are also incorporated into the model.

The study found that during the late 2000s, the total number of the Thai worker working abroad has been dropped worldwide, except in Africa and Australia and Oceania. The study found that there was no significant in the number of the returning migrant from the developed countries. But it discourages the new registers to apply for those countries. However, the destination of the new registered has scattered to other continents, i.e. Africa, South America, and Australia and Oceania. In the North America, where has encountered the most severe economic problems, it is interesting that the number of new register has declined, while the reentry has very tiny changed. It implies that once the workers have a chance to be able to legally reenter,

they tend to remain in the labour market, given any economic situation. This situation of the reentry is similar to Europe, where the number of reentry workers quite remains at the same level during 2008-2010. Yet, the new registered workers were substantially high in 2009, before dropped in 2010. In overall, the number of Thai workers applies for working permit in Europe has increased. Noticeably, the number of both new registers and re-enters to Asia suddenly shifts down in 2009. In Asia, the number of new register, then, increases in 2010, conversely to the reentry workers which is declined

To measure the impact of economic crisis on the labour market in Thailand, the employment and economic status of the year before the economic crisis is assumed to be the base case, where the growth does not fluctuated. The employment of various groups after the crisis is then estimated. The result is then compared to the actual data and deducted the potential employment due to the based case. This comprehensive method attempts to find the actual effects of economic crisis on the various groups of labor and economic sectors. The study found that the low-skilled worker of the manufacturing sector in Thailand has suffered from the crisis, yet in the short term. The temporary decrease in employment of this group because most manufacturing firms are exporting companies. The lower demand of the main importers in the Western Continent unarguably decreases the demand for goods.

The Thai government plays the important roles in maintaining the employment level. Its employment growth is more than 3% during 2007-2009. The public employment growth increases to about 8% in 2010. The overall private employment from 2007 to 2010 shows positive growth. However, the influenced factor that encourages the private employment is the informal sector. The growth rate of formal employment is declined.

The recently economic crisis in 2009 impacts on the tremendous number of layoff of exporting firms which are normally in the manufacturing sector. The share of experienced unemployed persons shows that the most suffered sector was the manufacturing sector because of its suddenly shifted up share of unemployed persons. However, the agricultural sector and informal employment absorb the worsening impact of economic crisis in 2009. The combination of government's objectives to decrease the unemployment rate and the absorption of the informal employment from the formal one helps dissolve the possible severe unemployment problem. However, the increase in the informal employment posits the public concerns to systematically improve the poor working condition of this growth after the crisis. The adjustment of employment in Southeast Asia has been similar to Thailand, especially in Vietnam and Cambodia, due to the comparable economic environment.

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