Chapter 2

Economic Development and Social Implications in Thailand

1. Introduction

Thailand is a small developing economy in Southeast Asia with a population of 67.2 million persons as of 2014. She is a middle-income country with nominal GDP ranks at the 28th among world countries with GDP per capita of US$5,771 (Nominal.). Currently, manufacturing industry's share is 39.2 percent second to the service sector of 52.4 percent in 2012. Even though the share of agriculture GDP is only 8.4 percent, the sector resides with a majority of the Thai population. Although the population who are still under the poverty line in 201 was reduced to be 7.2 percent, Thailand cannot manage to reduce the income inequality. The Gini's coefficient is 0.484 and 0.375 measured from income and expenditure side respectively in 2011. The Thai economy is quite stable in terms of inflation, unemployment, public debt to GDP ratio. Thailand is a destination of foreign direct investment. The overall creditworthiness is quite satisfactory in the eyes of rating agencies. Thailand has stable external stability with stable exchange rates owing to the foreign currency reserve of 226.17 billion USD as of 2017.

Table 2.1: Current Macro-Economic Statistical Summary for Thailand 2016

Macro-Economic Statistical Summary for Thailand	
Population	67.2 million (July 2014)
GDP	US$1.108 trillion (PPP; 2016) US$404.824 billion (Nominal; 2016 est.)
GDP rank	28th (nominal) / 20th (PPP) (IMF, 2017)
GDP growth	0.9% (2014), 2.9% (2015), 3.2% (2016e), 3.2% (2017f)
GDP per capita	US$15,319 (PPP; 2015) US$5,771 (Nominal.)
GDP by sector	Agriculture (8.4%), Industry (39.2%), Services (52.4%) in 2012
Inflation (CPI)	3.02% (Headline, in 2012); 2.09% (Core, in 2012)
Population below poverty line	7.2% (2015)
Ease-of-doing-business rank	46th (2017)

Gini coefficient	0.484 (income) (2011) 0.375 (expenditure) (2011)
Labor force	39.41 million (2012)
Unemployment	0.9% (2014)
Main industries	Automobiles and automotive parts (11%), financial services (9%), electric appliances and components (8%), tourism (6%), cement, auto manufacturing, heavy and light industries, appliances, computers and parts, furniture, plastics, textiles, and garments, agricultural processing, beverages, tobacco
Exports	US$215.38 billion (2016)
Export goods	Textiles, footwear, fishery products, rice, rubber, jewelry, automobiles, computers and electrical appliances
Main export partners	United States 11.2% China 11.1% Japan 9.4%, Hong Kong 5.5% Malaysia 4.8% Australia 4.6%,Vietnam 4.2% Singapore 4.1% (2015 est.)
Exports	US$215.38 billion (2016)
Export goods	Textiles, footwear, fishery products, rice, rubber, jewelry, automobiles, computers and electrical appliances
Main export partners	United States 11.2%, China 11.1% , Japan 9.4%Hong Kong 5.5%, Malaysia 4.8%, Australia 4.6% Vietnam 4.2 %, and Singapore 4.1% (2015 est.)
Imports	US$194.19 billion (2016)
Import goods	Capital and intermediate goods, raw materials, consumer goods, fuels
Main import partners	China 20.3%, Japan 15.4%, United States 6.9% Malaysia 5.9% , and UAE 4.0% (2015 est.)
FDI stock	US$186.1 billion (Dec 2015)
Gross external debt	US$158.29 billion (Sep 2015)
Public debt	41.83% of GDP (July 2017)
Revenues	2.393 trillion baht (FY2016)
Expenses	2.214 trillion baht (FY2016)
Economic aid	None

Credit rating	Standard & Poor's: A- (Domestic) BBB+ (Foreign) A (T&C Assessment) Outlook: Stable Fitch: A- (Local Currency IDR) BBB+ (Foreign Currency IDR) A- (Country Ceiling) Outlook: Stable Japan Credit Rating Agency:[A (Local Currency IDR) A- (Foreign Currency IDR) A+ (Country Ceiling) Outlook: Stable
Foreign reserves	US$226.17 billion (25 AUG 2017)
Note: *All values, unless otherwise stated, are in US dollars.* Sources: 1) *"Thailand". World Economic Outlook Database. International Monetary Fund. Retrieved 27 Aug 2012.,2) "World Economic Outlook Database". International Monetary Fund (IMF). Retrieved 9 May 2013.* 3) Main data source: **CIA World Fact Book**	

In this chapter, we would like to describe the brief chronology of the Thai economic development during the last decades. This comprises story behind growth episodes during past decades in terms of the economic growth accounting basis. The third section will in point out the trend of population change as well as the implication for the labor market imbalance and an influx of foreign migrant labor to fill up the demand for unskilled labor by labor-intensive sector. The final section describes the social implication in terms of the income inequality despite success improvement in poverty eradication. This is to lay our analysis for the further chapter on future development and the needs for infrastructures.

2. The Chronology of Economic Development, Structural Change, and Welfare

Economic growth and structural change in Thailand has been impressive during 1960-1990's. Thailand has emerged as 'middle-income country' during the period. Agriculture GDP has declined substantially while manufacturing and service sector has shown impressive growth episode. Economic growth had been interrupted when she had faced with financial turmoil in 1997.

After fixing her macroeconomic imbalance with a realignment of proper exchange rate regime, privatization of state enterprise, and rationalization of banking and financial sector in 1997-2000 Thailand has recovered and trying to emerged regain a position of a middle-income country with a competitive position in the export market with sound current account position. The size of her economy after repositioning country profile has been increased with higher per capita income.

Despite the full effort, Thailand has been still locked in the chronicle ' middle-income trap' after the 'financial crises' in 1997. Capital investment in public infrastructure was delayed after the crisis and accentuated by changing policies after several political eruptions. These several setbacks in the Kingdom have crippled her to exploit her potential to sustainable growth.

Even though Thailand was able to pay back the short-term rescued fund to the IMF's and resumed economic growth, she was unable to pull out of her chronicle ' middle-income syndrome' after the 'financial crises' in 1997. The Capital investment in the public infrastructure was delayed. The gross fixed capital investment had declined 21.7, 44.0 and 4.5 percent per year in 1997, 1998 and 1999 respectively. The volatilities of investment in Thailand were observed again during 'global financial crises in 2009, heavy flooding in 2011, political uprising in 2013 and 2014. The low level of capital investment was accentuated by low growth trend of labor forces owing to declining population growth in Thailand after 2000. This implies that Thailand may not be able to achieve a sustainable growth path in the coming decades if without solving the retard in its capital investment and labor productivity.

The capital investment may need further mentioned. They comprise both the capital investment in hard and social infrastructures. The former includes physical infrastructure like transportation and communication networks, energy, as well as management and technology. The social infrastructure, on the other hand, would be indispensable to work with the former efficiently. They are an investment in human capital such as education and training, health and urban welfare provision of public goods and dwelling for the low income. The investment in social infrastructure is, therefore, a sufficient condition for economic development and welfare improvement necessitated by the physical infrastructure investment.

2.1 The Economic Growth Episode of Thailand 1965-2013

The growth episode of Thailand can be separated into three epochs. During 1960's, Thailand has emerged as a less developed economy which had primary sector as her main production base. Thailand was the main exporter of rice, mineral and timber products to earn her foreign exchanges. During 1970's, Thai economy had entered business cycle fluctuation as result of oil shock as well as political upheavals. Growth trend had been affected by second oil shock in 1980 until 1985. After the Plaza Accord in 1985, Thai economy had received an influx of foreign direct investment, especially from Japan after currency realignment. As a result, economic growth trend has shifted up again since 1987-1995.

The rapid economic growth and the saving-investment gap had put pressure on

Thailand to seek for foreign saving. The excess demand for the fund has reflected in the wide gap of saving deposit-loan rates. Under a fixed exchange rate regime, Thailand could stabilize the fluctuation in export earnings in local currency. The contradiction has forced Thailand to open up the flow-of-fund account namely the "Bangkok International Banking Facility or BIBF". This is to compile with IMF's condition to relax the domestic money market and allow the inflow-outflow of foreign fund.

The interest rates arbitrage as well as the influx of cheap foreign fund through domestic banks have facilitated local investment and promoting growth. The 'Impossibility of Trinity' dilemma as a result of the fixed exchange rate regime had overblown of unmanageable money supply and inflationary pressure of asset prices. The weak banking compliance, land and real estate speculation and cheap source of fund flow had escalated the asset prices and overblown commercial banks' balance sheet. Thailand had been attacked by currency speculators several times. The currency attackers had speculated the huge loss of Thai foreign currency reserves and that Thailand would be forced de facto to devalue its foreign exchange rate. Finally, Thailand had to devalue exchange rate substantially to sustain outflow of foreign funds. At the peak, 'Baht-USD' exchange rate was an overshoot of 50 baht from the previous fixed rate of 25.4 baht. Thailand was viciously trapped in the turmoil of financial crisis in 1997. The devaluation had overwhelmingly ruined the balance sheet of commercial banks, companies who had borrowed through BIBF. Thailand had requested for the organized rescue fund 17.4 billion USD from IMF. The aftermath of the bankruptcy of companies, changing shareholders of commercial banks to foreign capital had been recorded already elsewhere.

Economic growth rates shrank to -1.4 and -10.5 percent in 1997 and 1998 respectively. The growth rates of capital investment had declined from its past trend significantly. They had shrunk-20.5, -44.3 and -3.2 percent per year in 1997, 1998 and 1999 respectively. Even though growth had resumed after 1999, the growth episode in the aftermath of Asian financial crises had changed its trend downward since 2000. More importantly, the capital investment and capital stock accumulation has been low and cannot help push up Thailand growth potential as compared with the pre-crisis ear. This has become the bottleneck to Thai economic development and welfare improvement in the current decade and beyond if it is not optimally solved.

Figure2.1: Growth Episode of Thailand 1965-2013 As Shown by

Figure 2.2: Capital Accumulation of Thailand As shown by Growth of

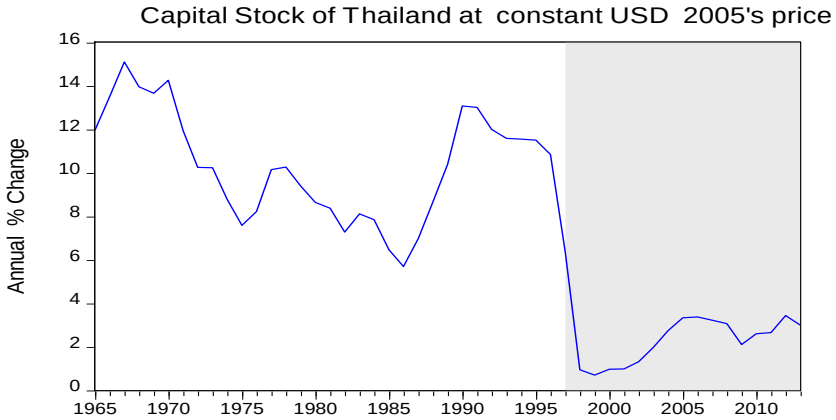
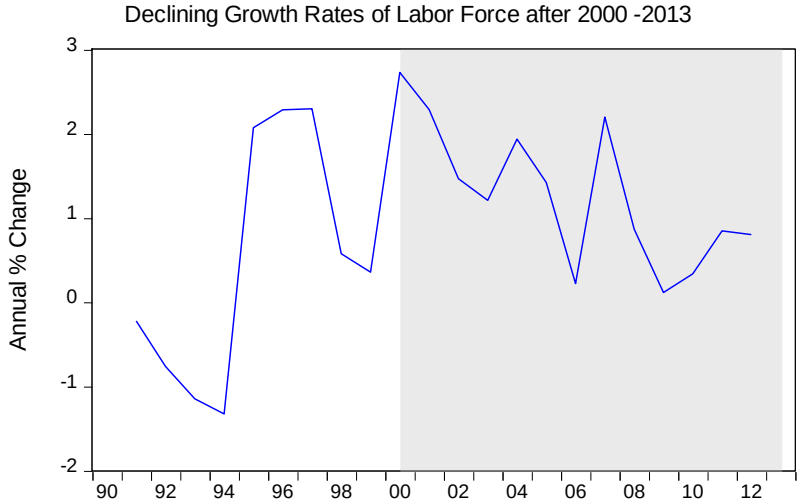


Figure 2.3: Declining Growth of Employment in Thailand 1990-2013 Shown by



Economic growth of Thailand had been vibrant during the past decades in each economic and social development plan since 1972. The average growth of GDP was 7.57 percent per year during 1972-1996. The GDP growth was contributed from the growth of

labor, land, and capital of 0.78, 0.12, and 5.38 percent respectively. Contribution by 'unexplained residual' or 'Total Factor Productivity, TFP' was on average 1.308 percent per year during the 5 planning periods. It was clear that capital accumulation in Thailand was gradually overemphasized in the development planning. The inefficiency of capital deepening in Thailand was as high as 6.7 in terms of 'Incremental Capital-Output Ratio, ICOR' during 1992-1996, pre-Asian financial crisis era. This may explain while financial crisis had erupted in Thailand in 1997.

Table 2.2: Growth Accounting During the Planning Periods of NESDB

Year	Avg. GDP growth	Labor	Land	Capital	TFP	K/Y* Capital-Output ratio	Y/K* Output-capital ratio	ICOR*
1972-76	6.53	0.68	0.31	3.06	2.49	3.34	0.30	1.4
1977-81	7.23	1.52	0.26	4.60	0.85	3.05	0.33	3.2
1982-86	5.37	0.54	0.05	4.36	0.43	3.13	0.32	2.9
1987-91	10.94	0.87	0.00	7.26	2.82	2.96	0.34	4.2
1992-96	7.95	0.33	0.02	7.65	-0.05	3.51	0.29	6.7

Note: * Last year of Plan 2) Labor, Land, Capital, and TFP are sources (contribution to) of Avg. GDP growth
3) ICOR=Incremental capital-output ratio 4) TFP is total factor productivity
Source: NESDB, Capital Stock of Thailand several issues

Table 2.3: GDP, Capital Stock, and Labor Employment Growth Rates 1990-2013

	1990	**1991**	**1992**	**1993**	**1994**
GDP at constant 2005's price (million USD)	8,923.9	96,534.3	104,337	112,946	123,097
(% change.)	11.2	8.6	8.1	8.3	9.0
Capital stock (million USD at constant 2005's price)	268,431	303,366	339,763	379,124	422,921
(% change)	13.1	13.0	12.0	11.6	11.6
LABOR employed (million persons)	32.2	32.1	31.9	31.5	31.1
(% change.)	--	-0.22	-0.76	-1.15	-1.33
Gross fixed capital formation (million USD at 2005's price)	42,914.5	48,356.3	51,565.6	56,348.8	62,753.2

(% change.)	29.6	12.7	6.6	9.3	11.4
	1995	**1996**	**1997**	**1998**	**1999**
GDP at 2005's price (million USD)	134,468	142,404	140,451	125,689	131,280
(% change.)	9.2	5.9	-1.4	-10.5	4.4
Capital stock (million USD at constant 2005's price)	471,585	522,724	555,958	561,216	565,144
(% change.)	11.5	10.8	6.4	0.9	0.7
LABOR employed (million persons)	31.7	32.4	33.2	33.4	33.5
(% change.)	2.07	2.28	2.29	0.58	0.35
Gross fixed capital formation (million USD at 2005's price)	69,809.7	74,718.4	59,370.8	33,055.5	31,988.8
(% change.)	11.2	7.0	-20.5	-44.3	-3.2
	2000	**2001**	**2002**	**2003**	**2004**
GDP at constant 2005's price (million USD)	137,515	140,496	147,967	158,532	168,589
(% change.)	4.8	2.2	5.3	7.1	6.3
Capital stock (million USD at 2005's price)	570,628	576,220	583,767	595,320	611,659
(% change.)	1.0	1.0	1.3	2.0	2.7
LABOR employed (million persons)	34.4	35.2	35.7	36.1	36.8
(%change.)	2.73	2.29	1.47	1.21	1.94
Gross fixed capital formation (million USD at 2005's price)	33,741.2	34,123.7	36,357.9	40,741.8	46,104.3
(%change.)	5.5	1.1	6.5	12.1	13.2
	2005	**2006**	**2007**	**2008**	**2009**
GDP at constant 2005's price (million USD)	176,352	185,333	194,682	199,519	194,870
(% chg.)	4.6	5.1	5.0	2.5	-2.3
Capital stock (million USD at 2005's price)	632,041	653,373	674,442	695,089	709,680
(% change.)	3.3	3.4	3.2	3.1	2.1

LABOR employed (million persons)	37.4	37.5	38.3	38.6	38.7
(%change.)	1.42	0.22	2.20	0.86	0.11
Gross fixed capital formation (million USD at 2005's price)	50,965.1	52,933.7	53,738.2	54,368.8	49,345.1
(%change.)	10.5	3.9	1.5	1.2	-9.2
	2010	**2011**	**2012**	**2013**	
GDP at constant 2005's price (million USD)	210,091	210,253	226,373	230,371	
(%change.)	7.8	0.1	7.7	1.8	
Capital stock (million USD at 2005's price)	728,155	747,460	773,153	796,320	
(% change.)	2.6	2.7	3.4	3.0	
LABOR employed (million persons)	38.8	39.1	39.4	--	
(% change.)	0.34	0.85	0.80	--	
Gross fixed capital formation (million USD at 2005's price)	53,959.0	55,713.7	63,066.0	61,824.5	
(% change.)	9.4	3.3	13.2	-2.0	

Source: Data are from National Accounts, NESDB, Labor Force Survey, NSO several issues

Table 2.4: Macro-Economic Indicators on the Expenditure Side

Year	Private Consumption' expenditure (% growth)	Private Consumption' expenditure % of GDPR	Investment (% growth)	As % of GDPR	Export (% growth)	Trade Openness (x100% GDPR)	Gross Saving As % of Current GDP	Current A/C Balance As % Curren GDP	Inflation in % per year average from monthly base
			(3)	(4)	(5)	(6)	(7)	(8)	
1995	NA	54.5	NA	49.3	NA	0.91	35.05	-8.02	5.8
1996	5.03%	54.2	6.9	49.9	-4.48%	0.83	34.69	-8.03	5.8
1997	-1.41%	54.9	-21.7	40.1	9.05%	0.85	32.20	-2.01	5.6
1998	-10.20%	53.4	-44.0	24.3	10.79%	0.87	32.64	12.53	8.0
1999	4.07%	53.1	-4.49	22.2	8.64%	0.92	30.02	9.81	0.3

2000	7.04%	54.4	3.09	21.9	15.83%	1.06	30.05	7.37	1.7
2001	5.90%	55.7	1.83	21.6	-0.02%	1.03	27.96	4.24	1.6
2002	6.22%	55.8	6.19	21.6	5.89%	1.03	26.58	3.47	0.7
2003	7.35%	55.8	12.64	22.7	9.13%	1.05	27.12	3.13	1.8
2004	7.43%	56.4	15.86	24.7	14.63%	1.16	27.79	1.60	2.8
2005	4.20%	56.5	14.28	27.1	7.76%	1.25	26.38	-4.04	4.5
2006	2.80%	55.3	2.61	26.5	10.79%	1.27	28.06	1.04	4.7
2007	1.19%	53.1	1.75	25.6	8.89%	1.29	31.42	5.93	2.2
2008	2.83%	53.6	2.34	25.8	6.26%	1.37	28.55	0.32	5.5
2009	-1.25%	53.4	-10.8	23.1	-12.54%	1.15	28.51	7.88	-0.8
2010	5.00%	52.1	11.60	24.0	14.13%	1.27	28.72	3.37	3.3
2011	1.77%	52.6	4.87	25.0	9.18%	1.39	29.33	2.54	3.8
2012	6.34%	52.2	10.20	25.7	5.08%	1.37	27.62	-0.41	3.0
2013	0.84%	51.2	-0.82	24.8	2.78%	1.36	26.29	-1.15	2.2
2014	0.62%	51.1	-2.61	23.9	0.04%	1.32	27.67	3.71	1.9

Note 1: Private Consumption Expenditure measured at a constant price; Gross Fixed Capital Formation at Constant price; GDPR is at a constant price; Export and Import growth rates are at constant prices; Trade Openness = Real Export plus Real Import over constant GDP ratio. Note 2: Thailand had invoked the Asían financial crisis in 1997. In 2009 Thailand was affected by the global financial crisis and heavy flooding in Thailand in 2011

Source: World Bank (2015), and WEO (2012)

Knowing that Thailand has been delayed in capital investment, in early 2015, the current government has approved an infrastructure development plan in special economic zones. The plan includes 45 projects, budgeted at 2.6 billion baht. Another 79 projects, worth 7.9 billion baht, are planned to carry out in 2016. Most of the projects are transportation and communication infrastructure investment. These are, for example, the new railway's system, roads system network as well as enlargement of airports. This is to lay integrated hard infrastructure to link with AEC through cross-border trade routes.

The projects are financed by complementary of government revenue, government bond and another funding method such as 'public-private' fundraising. The planned investment budget is US$83 billion over seven years. The idea is to link with 2.4 billion consumers in China and India, and the AEC (ASEAN Economic Community).

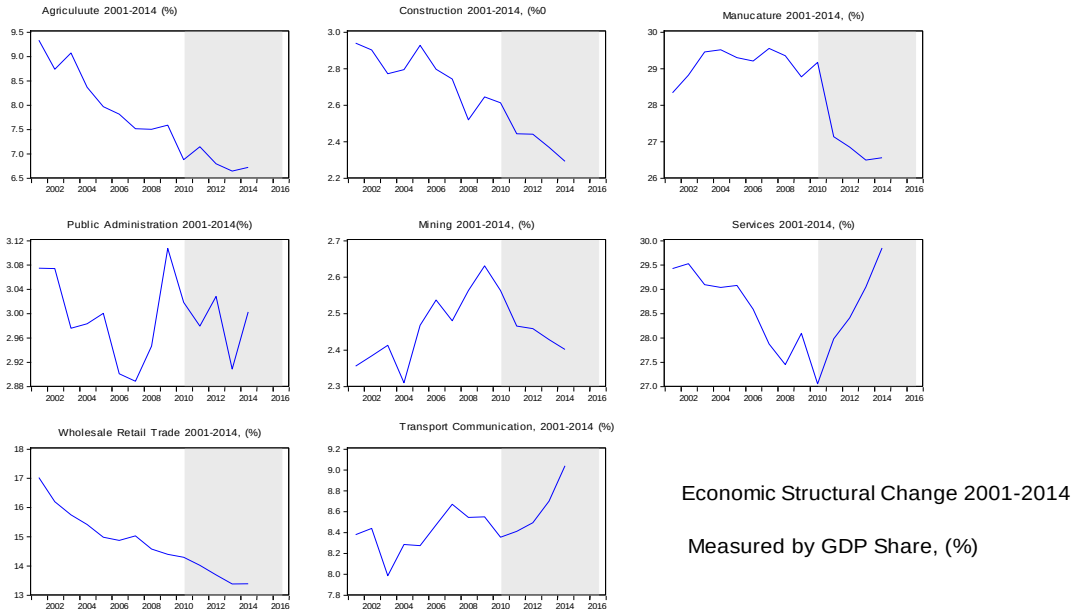
2.2 Structural Adjustment in Thailand 2001-2014

The agricultural sector has declined its contribution in terms of value added share. 'Land' contribution has declined as land frontier has been reached. Our growth accounting below has shown that land has subsequently declined in its contribution in Growth Accounting[1]. This is in accordance with the shifting from agriculture sector to non-agriculture sector in Thailand. Manufacturing share has surpassed the share of agriculture in 1980's. Thailand had a success story of manufacturing growth during 1980-2000. Later, after 2000-2013 the GDP's share of Transport and communication and Service sector have been rising

Before the Asian crisis 1965-1997, Thailand has tried to raise productivity by gradual mechanization in the agriculture sector to counter rising wage rate. Likewise, the manufacturing sector has tried to introduce modern technology and machines during last decades to drive industries successively from labor-intensive to a further level. However, after the financial crises and business cyclical downswings, agriculture, manufacturing, and services sector could not turn away from cheap unskilled labor to technology-intensive that works with skilled labor. In the public sector, capital investment in public infrastructure had been prolonged.

In agriculture, land productivity has declined as an encroachment on new land has reached frontier. Farmers are aging, while the younger generation is reluctant to pursue the farming career. The price of agriculture product has been suppressed and volatility of world demand.

Figure 2.4: GDP Share by Sector 2001-2014



[1] *Growth accounting of GDP (%) = [Growth of Capital (K)* value share of r.K / Y] + [growth of Labor (L)* value share of w.L/Y] + [Growth of Land services (LD) *value share of land value rent*LD/Y] + TFP. Where w = average wage ; r = average rate of return to capital input; rent = land rent ; d(XXX)/dt = derivative (XXX) with time respectively.*

It should be noted that for Thailand, the automotive production and sales employed approximately 417,000 workers in 2015. It is approximately 6.5 percent of total employment across all manufacturing industries. In 2014, Thailand exported US$25.8 billion in automotive goods. As many as 73 percents of automotive sector workers in Thailand may face a risk of job loss due to technological change in the industry towards automation and change consumer's preference[2].

Moreover, China has replaced the United States as Thailand's largest export market while the latter still holds its position as its second-largest supplier after Japan. Thailand's traditional major markets like North America, Japan, and Europe, as well as other Thailand's regional trading partners, have helped Thai export growth in recent economic recovery

Table 2.5: Sources of Growth in Thailand as Shown by Growth Accounting

Sources of Growth In Thailand 2010-2015						
	1999	**2000**	**2001**	**2002**	**2003**	**2004**
GDP growth [dY/dt]/Y	4.4	4.8	2.2	5.32	7.14	6.34
of which contributed to Growth of factor inputs (weighted by value-added share)						
- Total Factor Productivity, TFP (Unexplained Residual of growth determinants)	3.04	3.40	0.62	3.36	4.95	3.36
- Growth of Capital service (r.k) [dK/dt]/K	0.9	1.2	1.0	0.91	1.29	1.81
- Growth of Labor head (w.L)[dL/dt] /L	0.46	0.2	0.58	1.01	0.79	0.87
-Growth of land service (rent.LD) [dLD/dt]/LD	Na.	Na.	Na.	0.03	-0.02	0.01

[2] *Chang, Jae-Hee; Rynhart, Gary; Huynh, Phu (July 2016). ASEAN in transformation: How technology is changing jobs and enterprises (PDF) (Bureau for Employers' Activities (ACT/EMP) working paper; No. 10 ed.). Geneva: International Labour Office, Bureau for Employers' Activities (ACT/EMP). ISBN 978-92-2-131142-3. Retrieved 1 April 2017*

Sources of Growth In Thailand 2010-2015 (continued)						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
GDP growth [dY/dt]/Y	4.53	5.11	4.93	2.48	-2.33	7.8
of which contributed by Growth of factor inputs (weighted by value added share)						
- Total Factor Productivity, TFP (Unexplained Residual of growth determinants)	2.03	2.36	2.16	-0.28	-4.28	4.94
- Growth of Capital service (r.k) [dK/dt]/K	1.96	2.31	2.28	1.99	1.40	2.53
- Growth of Labor head (w.L)[dL/dt] /L	0.50	0.41	0.51	0.69	0.56	0.28
-Growth of land service (rent.LD) [dLD /dt]/LD	0.40	0.04	4.93	2.48	-2.33	0.04

Source of Growth In Thailand 2010-2015(continued)					
	2011	**2012**	**2013**	**2014**	**2015**
GDP growth [dY/dt]/Y	0.1	6.5	2.90	0.71	2.8
of which contributed by Growth of factor inputs (weighted by value added share)					
- Total Factor Productivity, TFP (Unexplained Residual of growth determinants)	-1.45	3.69	0.73	0.2	1.73
- Growth of Capital (rk).[dK/dt]/K	1.28	2.36	2.2	1.27	1.13
- Growth of Labor (wL).[dL/dt] /L	0.35	0.76	-0.03	-0.76	-0.06
-Growth of land service (rent.LD) [dLD /dt]/LD	-0.07	0.0	0.0	na	a

Source: Source: NESDB, Capital Stock of Thailand several issues

The average growth rate of GDP during 1999-2004 was 5.03 percent per year. It was contributed by a growth of capital stock, labor, and a land factor of 1.19, 0.65, and 0.01 percent respectively. During this period, TFP contribution to growth was as high as 3.12 percent per year. Growth performance was on average 3.51 percent per year during 2005-2009. The TFP contribution was 0.89 percent lower than the contribution from the growth of the capital stock of 1.96, from labor 0.59 and from land 0.92 percent per year during the same period. During 2010-2015, growth rates have recovered to 3.87 percent with the contribution from TFP of 1.80 percent. The contribution from capital stock, labor and land factor inputs is 1.64, 0.42 and 0.46 percent per year respectively.

Growth accounting in 2013 may not be a further indication of sector different of growth prospect in Thailand. It seems that agriculture has lost its long-term role as

leading growth contribution in Thailand. The service sector has emerged as a leading sector while it is still not clear of how the manufacturing sector would be heading for in the coming decades. In 2013, which is not a normal year owing to political upheaval in Thailand, the manufacturing sector has been slow down significantly. It has negative TFP like that of the agriculture sector. Overall capital productivity in Thai economy in 2013 was not impressive. The reason has been mentioned earlier. Public and private capital investment in Thailand has been delayed and makes Thailand dipped deep into business cycle dowsing and cannot get out of the 'middle-income syndrome'.

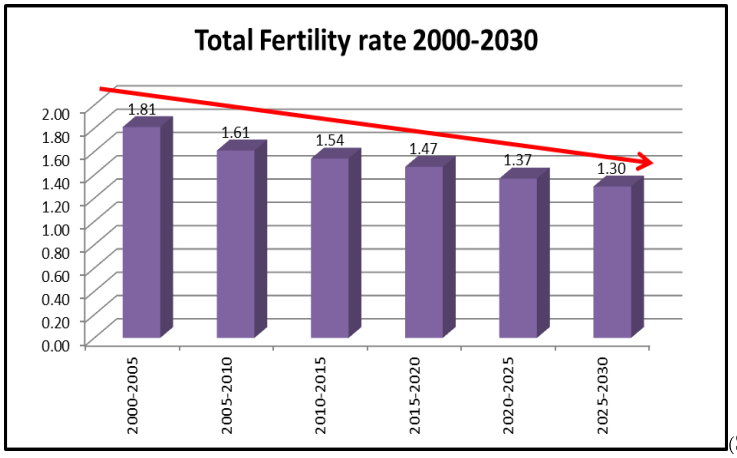
3. Population As Determinants of Sustainable Growth and Welfare 2015-2040

3.1 Population Change towards Aging Society in Thailand

It is projected the Total Fertility in Thailand would be declining 2000-2030. The peak of a population would be in 2025 and declined thereafter until 2040. The gap between genders still exists over time. A number of the male is lower than female projection. It is clear that Thailand enters to the epoch of population aging. The working population is declining as well.

It is clear that declining fertility in Thailand will have deep repercussion on Thai economy in the long-run. Labor force and labor supply would be a shortage in terms of quantity. The more severe constraint for Thailand would be insufficient qualified labor supply for modern industries. Labor shortage problem cannot be solved by relying on foreign migrants like now. In the coming decades, modern industries like the ICT, modern energy engineering, the Artificial Intelligence, and Robot as well as biotechnology etc., would be likely to change the industrialization landscape in the world. Population and labor quality of Thailand has to comply and prepare for such change.

Figure 2.5: Declining Total Fertility rate 2000-2030



(Source: NSO, NESDB)

Aging and urbanization in Thailand would be materialized sooner or later. We cannot avoid preparing the capital investment in hard, technical as well as soft infrastructure for the future. The constraint as result of the aging population may be turned into positive factor as far as biotechnology and medical health investment can be properly planned in Thailand. The non-communicable disease (NCD) where the disease is not caused by infectious agents but rather by a social behavior of human would be dominant threats to our society like other developed and developing countries in the urbanization process. We, therefore, need to prepare the public and private investment in the preventive medical health. The rising proportion of the female population would be also a benefit than the cost. Clearly, household type would be much oriented to 'single head' as result of high divorce rates, 'one-person' as single women are more independent to live and work without marriage as before. Thus, the demand for dwelling in the urban area is indispensable. Especially, low-income housing would be topic among policy planners in Thailand in the coming decades.

Figure 2.6: Population by Age Cohort: Male and Female 2010-2040

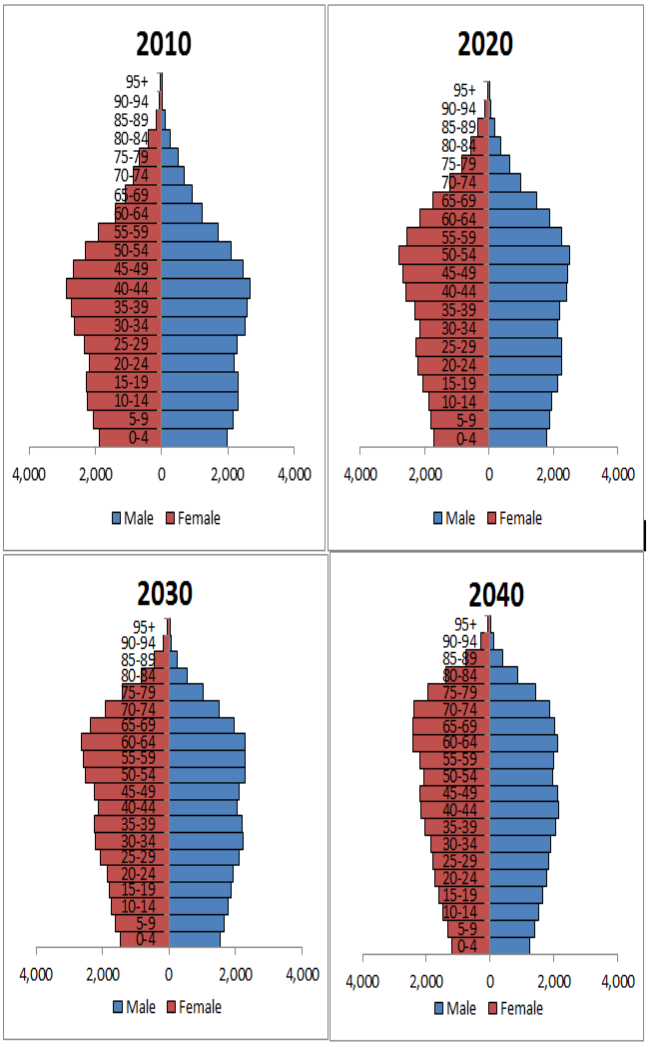
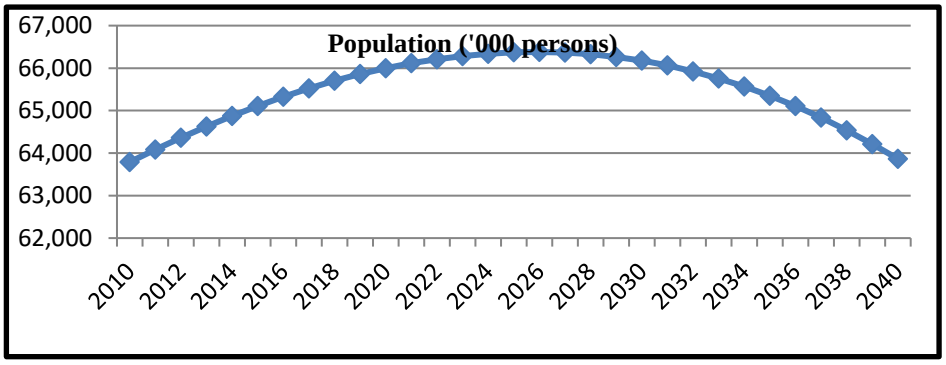
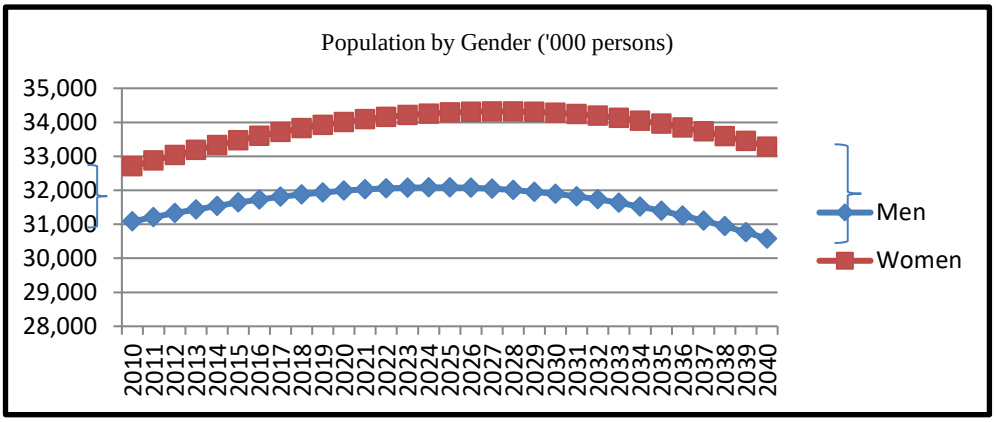


Figure 2.7: Trend of Population in long-run 2010-2040



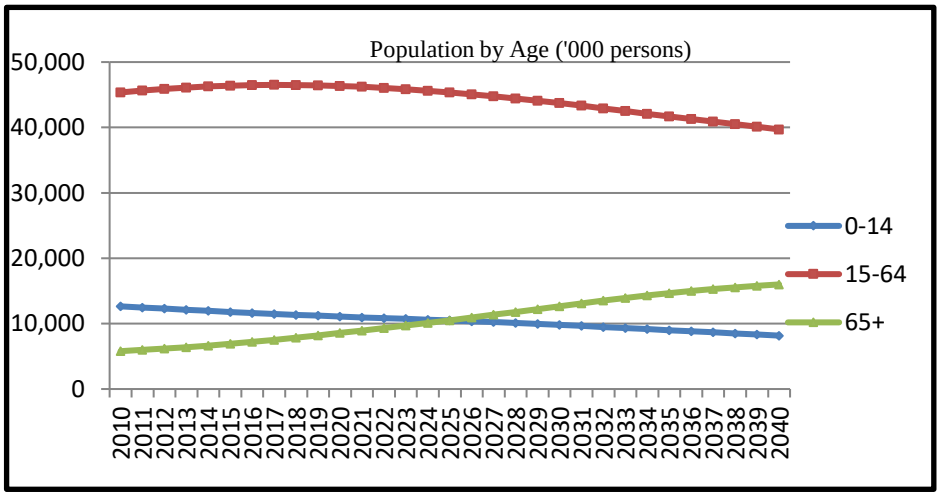
(Source: NSO, NESDB)

Figure 2.8: Widening Gender Gap



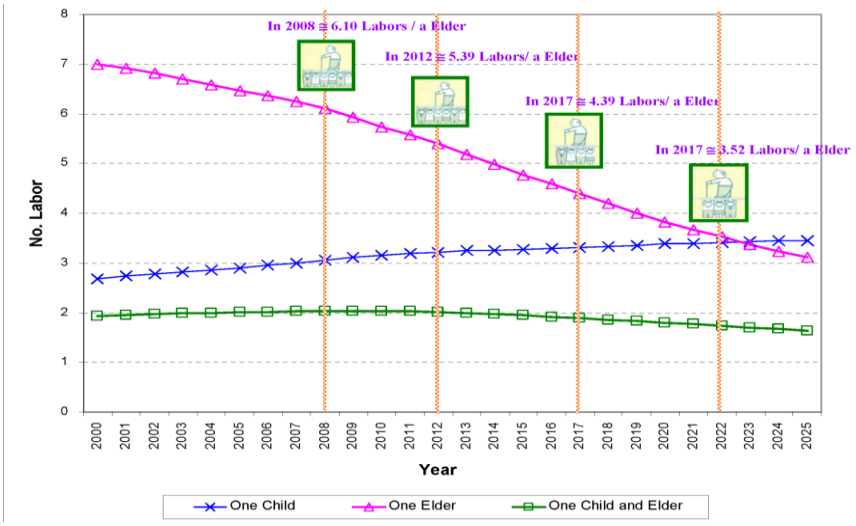
(Source: NSO, NESDB)

Figure 2.9: Trend of Population Aging 2010-2040



(Source: NSO, NESDB)

Figure 2.10: Increasing burden of Working population 2000-2025



3.2 Structural Change in Thai labor market 2000-2015

Not only was the structural change in production sector observed during the phase of new normal (2000-2015), there was a structural change in the labor market as well. Skills by the level of education and occupation are defined as follows:

Table 2.7: Skilled – Unskilled Labor Definition this study

Occupation	Human capital Investment intensity	Skill Classification
1. Managers	Occupation dominant.	Skilled
2. Professionals Technicians and associate professional	Occupation dominant	Skilled
3.1 Clerical support workers	Moderate	Skilled
3.2 Clerical support workers	Low intensity	unskilled
4.1 Service and sales workers	Moderate	Skilled
4.2 Service and sales workers	Low – intensity	unskilled
5.1 Skilled agricultural, forestry and fishery workers	Moderate	Skilled
5.2 Skilled agricultural, forestry and fishery workers	Low – intensity	unskilled
6.1 Craft and related trades workers	Moderate	Skilled
6.2 Craft and related trades workers	Low – intensity	unskilled
7.1 Plant and machine operators and assemblers	Moderate	Skilled
7.2 Plant and machine operators and assemblers	Low – intensity	unskilled
1.1 Elementary occupations Workers	Moderate	Skilled
1.2 Elementary occupations	Low - intensity	unskilled

Note 1) Skilled Matching Criterion by Occupation-Human capital Investment 2) Low human capital intensity is inclusive of Primary education and lower; secondary and post-secondary education both general and vocational stream 3) High human capital intensity is inclusive of tertiary education up to doctoral degree respectively.

There is a clear increasing trend of skilled labor employment in most of the

sector. Most of them are 'wage earner' type of skilled labor. The monthly wage gap between skilled and unskilled labor is a key factor in determining employment by labor skill formation. The wage gap between skill-unskilled labors who is Thai nationals has induced employment substitution between skill and unskilled labor. Employers who would need skilled labor to suit skill intensive technology investment could not find the proper supply from the labor market. While on the other hand, an employer who sticks to labor-intensive technology could neither find unskilled labor in the market.

The Asian financial crisis since 1997 and maybe global financial crisis, as well as an unstable political situation in Thailand, have affected public investment in both physical as well social infrastructures. The domestic private sector has behaved accordingly in delaying their capital investment in firms' types of machinery and equipment. The only private capital investment was from foreign firms at large. As a result, the private sector has been pressured to employed foreign migrants to optimize their wage cost solution.

The influx of these foreign migrants has suppressed the average wage in Thai labor market as well. The prolonged capital investment by private and public sector has suppressed overall productivity of capital and labor, simultaneously resulting in declining TFR too.

Cheap wage bill may help firms to survive but it has deteriorated the demand for education and training investment of households. Households may be able to borrow to finance the investment to higher education in vocational and graduate level but they may be not certain of a long-run return on education investment since wage rates have been suppressed for so long. This may lower intake of young children into the school system. The situation of shortage of labor in Thailand thus did not lead to higher wage and skills' formation as mostly understood in the textbook. Rather, population aging, shortage of unskilled labor, delay in human capital investment has resulted in severe skill labor shortage where unskilled labors are solved by foreign migrants, wage suppression and deterioration in household welfare.

Structural change in Thai labor market can be seen from the declining trend of employed persons both wage and non-wage earners (self-employed) in agriculture sector vis-à-vis others. We can observe a rapidly rising trend of skill labor employment in all other sectors since 2011. In fact, the rising trend of skill wage earners has been very clear in these sectors. This implies that Thai industries and services have changed to employ more skilled labor. Clearly, we observe the rising trend of skill wage during the latter half of 2000. This does not mean that unskilled wage would be stagnant but rather we can observe the rising trend of unskilled wage as well.

For the agriculture sector, it is interesting to see the shifting downward trend of

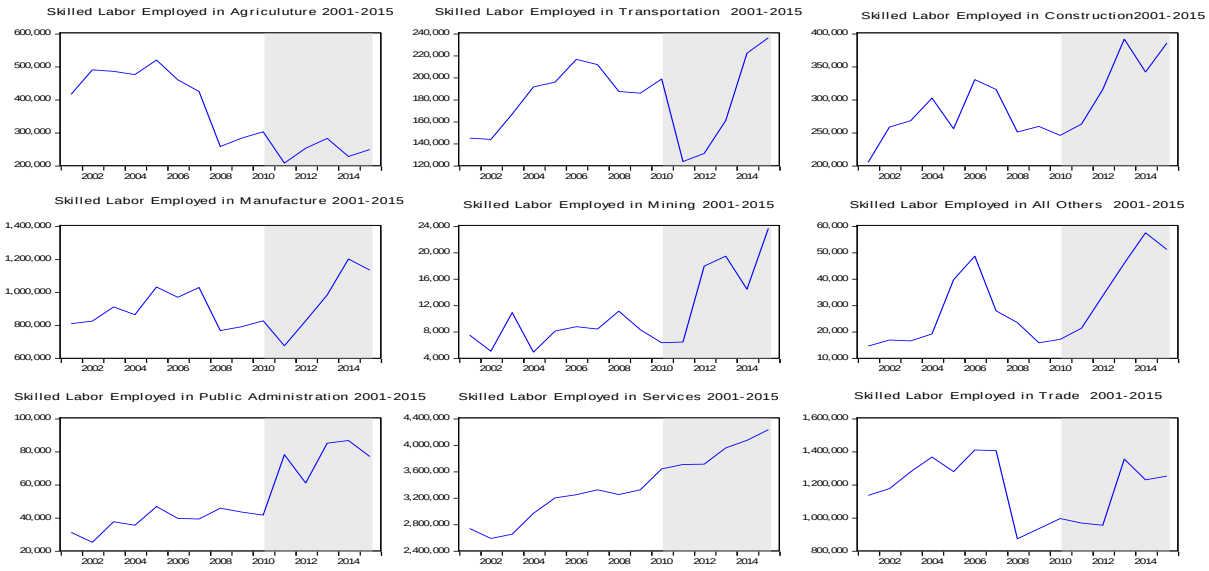
skill wage after 2011, while there has been increasing trend of unskilled wage during 2006-2013. This may be a result of rising paddy price as result of government rice policy. It has declined thereafter owing a downward movement of agriculture price and mechanization in the rural paddy field to substitute for the shortage of unskilled labor.

The Thai labor market has been shifted to normal trend after the long suppression of daily wage. This might be the result of rising of a minimum wage to 300 baht a day in 2012. There might have spilled over effect to pull unskilled labor from rural field to urban area. Assuming that average wage is average productivity of labor by sector. The unskilled wage gap still exists among sectors too. The average monthly wage gap of unskilled labor in manufacturing –agriculture sector has been widening during a phase of business cycle. The service – manufacture wage gap was not significant. However, we observe the declining trend of public administration average wage per month of the unskilled labor.

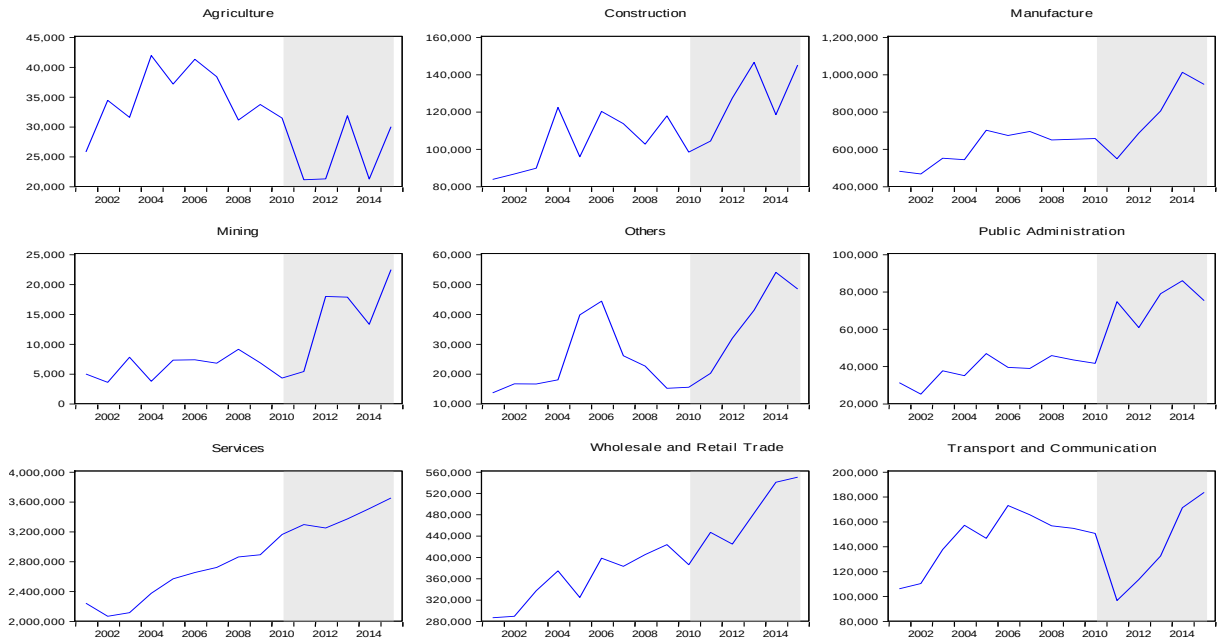
The average wage of skilled labor in every sector is much higher than those of the unskilled labor. This confirms the average higher return on investment in education and training as well heath factor of human capital theory. Skill wage of manufacturing sector 40,000-45,000 baht per month during 2013-2014 twice of that skill labor's wage in the agriculture sector and 1.5 times of skill labor's wage in the service sector. Interesting enough, we observe the skill labor's wage for the public sector was as high as 60,000 baht a month in 2013.

The wage gap of skill and unskilled labor among sectors in Thailand are consistent with human capital investment paradigm. That is to say, should Thailand would shift her economy towards capital-intensive away from labor-intensive industries by further capital investment in physical infrastructure is a necessary condition to solve the over-dependent on foreign migrant labor. The higher capital intensity would only sufficiently work with higher qualified labor with proper modern skills. Thus, Thailand would need to have proper human capital investment. In order to raise the "Human Development Index", Thailand would need further social investment in human capital investment in education and training, health and urban welfare of her populations. Moreover, as public sector investment in physical infrastructure would also need qualified personnel to provide service from civil servants of central and local government officials, we would also need to raise their productivity too.

Figure 2.11: Total Skilled Labor Employment and Skill Wage Earners by Sector 2001-2015

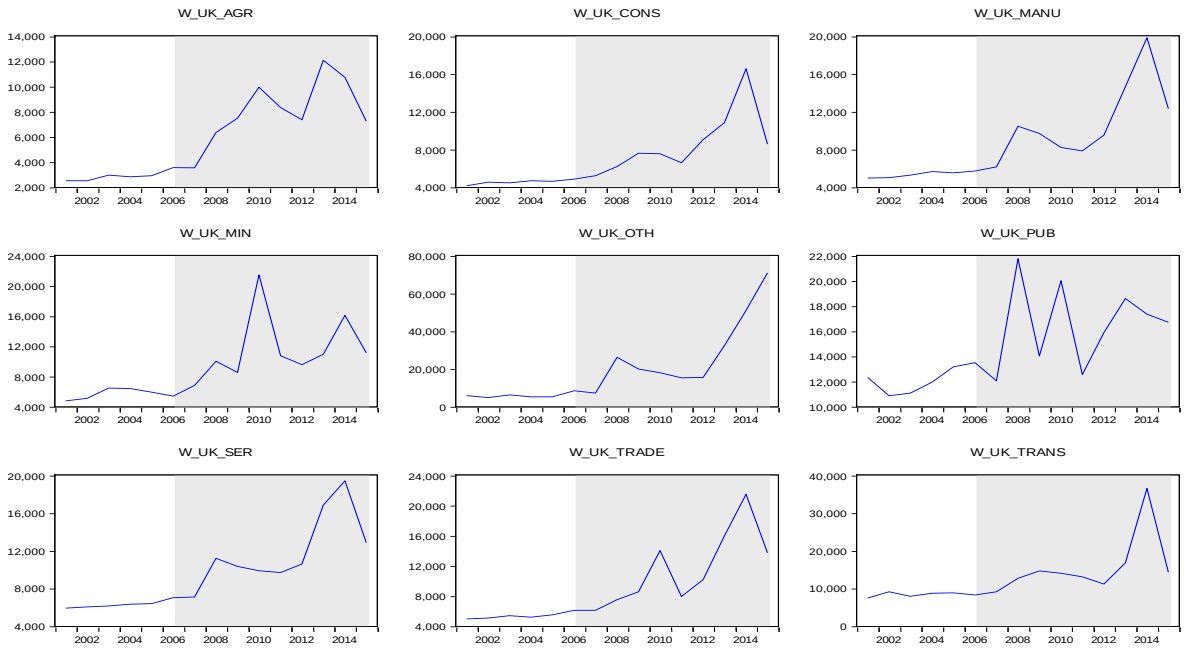


Total Employed Skilled Labor (wage and non-wage earners) 2001-2015 (number in persons)

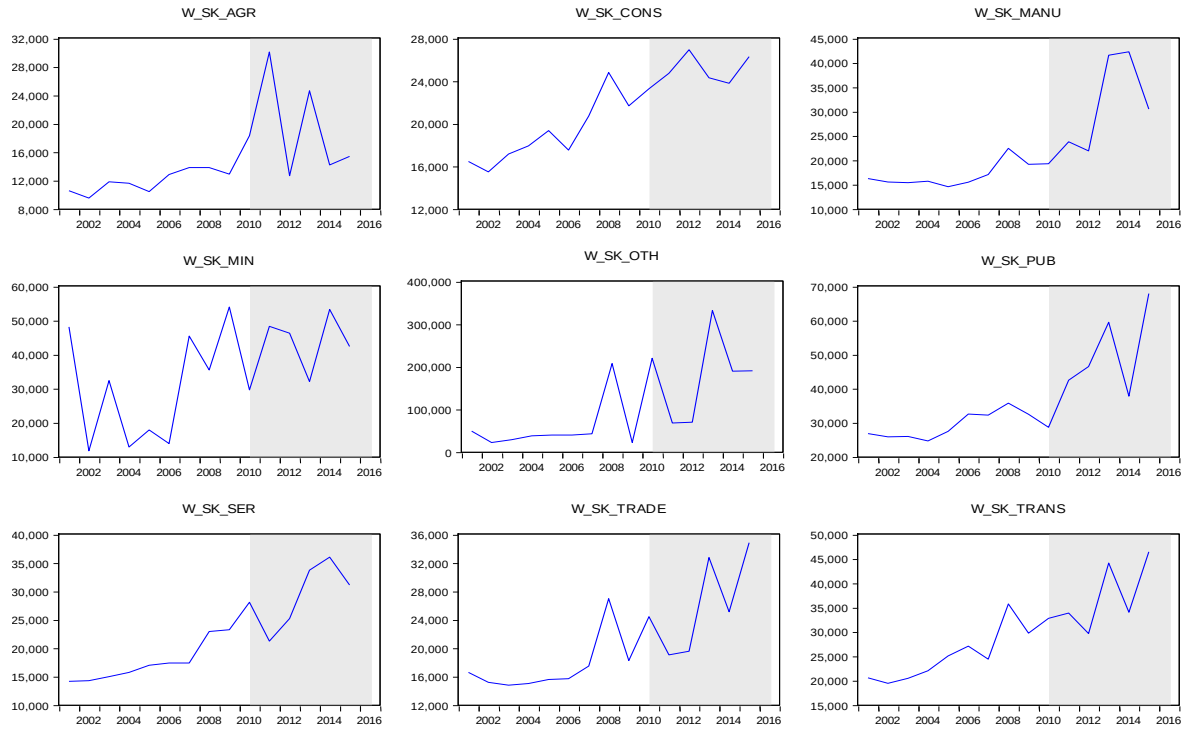


Number of Skilled Wage Earner by National Account Sector 2001 2015 (in persons)

Figure 2.12: Unskilled and Skill Wage Earners by Sector 2001-2015



Average Wage of Unskilled Labor (imputed from wage earners)
2001 2015 (in baht per month)



Average Wage of Skilled Labor 2001 2015
(in baht per month)

Note: imputed from skilled w age earnersl

3.3 Rural-Urban Internal Migration and International Migration

Depopulation in Thailand has been critical in the Rural Sector. The wage differential over the decades between rural-urban and over concentration of urbanization has caused rapid 'Internal Migration' out of rural to urban. Education investment could not supply sufficient skilled labor. Low unskilled wage has caused a shortage of Thai unskilled labor supply. Employers employ foreign migrants for labor-intensive economic activities. Bangkok has become Mega-Urban City Area while on contrary, rural becomes 'hallowing'. It is not clear whether internal migration will reach a turning point as has been observed in many other forerunners countries.

FDI and Aggregate demand expansion have induced excess demand for labor. The capitalization of Thai industry has been delayed. Most of the domestic industry relied on cheap wage unskilled labor. The excess demand gap for unskilled labor was fulfilled by guest labor from neighboring countries

According to Limskul, Puttanpong, and Borwornchaithamrong (2015), the AEC Integration would have a positive impact on Thai economic development. The labor-intensive has to reduce her dependency on foreign guest labor or move outward to neighboring countries.

Table 2.8: Internal Migration and International Migration Thailand - ASEAN

Internal Migration in Thailand 2002-2009

		2002	2004	2005	2006	2007	2008	2009
NORTHEASTERN	Urban	168,349	99,841	34,657	45,500	34,750	18,069	18,729
	Rural	554,373	294,551	118,148	137,974	90,731	107,000	83,226
NORTHERN	Urban	88,932	56,084	48,761	28,869	26,140	17,874	19,516
	Rural	236,421	121,000	50,274	66,310	43,032	55,421	47,646
SOUTHERN	Urban	83,132	48,665	44,377	25,154	21,114	25,110	29,170
	Rural	73,466	53,812	37,655	24,877	34,866	25,423	32,196
CENTRAL	Urban	336,610	215,655	206,603	132,724	120,635	149,229	213,283
	Rural	280,101	203,358	197,717	102,030	116,443	106,253	116,094
Bangkok	Urban	1,535,793	794,104	654,381	440,641	485,085	390,238	452,782

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Note: data is shown in terms of 'Net Migration'.

Source: Limskul, Puttanpong, and Bowonthumrongchai (2015)

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- Migrants stock in Thailand and ASEAN

2015								
	Tha	cam	lao	MYM	ROASEAN	ROW	vie	Migration Ou
Tha		106,850	4,729	117	197,915	660,534	1,133	**971,278**
cam	214,868		1,356	47	8,957	309,632	127	**534,987**
lao	183,421	925		53	11,554	339,594	183	**535,730**
MYM	1,261,521	185	393		41,356	187,378	645	**1,491,477**
ROASEAN	24,067	1,892	20	905		4,818,458	9,216	**4,854,559**
ROW	617,386	11,416	4,336	170,200	2,516,972		13,794	**3,334,104**
vie	12,869	129,997	9,245	303	54,035	1,996,558		**2,203,007**
Migration In	**2,314,133**	**251,264**	**20,079**	**171,626**	**2,830,789**	**8,312,153**	**25,099**	

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Source: Limskul, Puttanpong, and Bowonthumrongchai (2015)

The internal migration (net) from rural to urban was observed phenomena (not shown here) during 1980, 1990, and 2000. It was a time where population and labor force in Thailand increased. The wage gap between rural-urban had induced an outflow of internal migrations Thailand. In the past, the net migration was significant from rural and urban (non-BMR) area to the BMR per se. The period from 2000-2009 has depicted a reverse trend of internal migration outflow to BMR with declining trend.

The constraint of public-private capital investment has resulted in the delay technological change in Thai industries. The agriculture, manufacture and services activities in Thailand still relied on labor-intensive technology. Thus, employers chose to hire foreign migrants instead of Thais who would seek lesser tough jobs. In 2015, it was found that most of the foreign migrants were from neighboring countries, especially from Myanmar, Cambodia, and Laos.

The current situation of the labor market in Thailand can be summarized as follows: Total Thai 39 million persons are employed in 2010. Among those employed persons who are defined as *skilled* are altogether 3.5 million persons or 9% of total employment. The foreign guest labors in Thailand amount to 1.8 million persons or 4.8% of total employment. They comprise highly skilled worker of 100,714 persons and semi and low skilled worker of 1.79 million persons respectively. Mining and Quarrying is the sector which employs intensive foreign skilled labor (4.46% of total labor employed in this sector). In term of wage bills, Mining and Quarrying sector has paid 25.73% of total wage bills in this sector. The service sector is the biggest absorption of foreign skilled labor. They amount to 60,533 persons. The Manufacturing sector has absorbed a large number

of 'Unskilled Foreign Labors'. They have amounted to 553,892 persons or 10.78%

Table 2.9: Thai-Foreign Employed Labor by Skills (Persons)

	National Skilled Labor	Foreign Skilled Labor	National Unskilled Labor	Foreign Unskilled Labor	Total
Agriculture, forestry and fishing	31,611	261	16,485,412	354,477	16,871,761
Mining and Quarrying	5,246	1,584	27,004	1,645	35,479
Manufacturing	400,474	19,873	4,165,493	553,892	5,139,732
Public Utilities	42,158	784	94,549	1,668	139,159
Construction	165,037	6,468	1,104,525	117,225	1,393,255
Wholesale and retail trade, repair of motor vehicles motorcycles	269,200	11,107	4,187,545	202,933	4,670,785
Transportation and storage	48,688	2,105	696,021	11,852	758,666
Service	2,426,102	60,533	5,204,183	259,562	7,950,380
Unknown	65,137	1,999	2,180,919	290,425	2,538,480
Total					39,497,697

Table 2.10: Thai-Foreign Employed Labor by Skills (in percentage)

	National Skilled Labor	Foreign Skilled Labor	National Unskilled Labor	Foreign Unskilled Labor	Total
Agriculture, forestry, and fishing	0.19%	0.00%	97.71%	2.10%	100.00%
Mining and Quarrying	14.79%	4.46%	76.11%	4.64%	100.00%
Manufacturing	7.79%	0.39%	81.04%	10.78%	100.00%
Public Utilities	30.29%	0.56%	67.94%	1.20%	100.00%
Construction	11.85%	0.46%	79.28%	8.41%	100.00%
Wholesale and retail trade, repair of motor vehicles motorcycles	5.76%	0.24%	89.65%	4.34%	100.00%

	National Skilled Labor	Foreign Skilled Labor	National Unskilled Labor	Foreign Unskilled Labor	Total
Transportation and storage	6.42%	0.28%	91.74%	1.56%	100.00%
Service	30.52%	0.76%	65.46%	3.26%	100.00%
Unknown	2.57%	0.08%	85.91%	11.44%	100.00%

Source: NSO's Population Census 2010 with adjustment.

3.4 Income Distribution and Welfare

Thailand has reached the level of economic development where poverty has reduced substantially. The implication of poverty reduction means an improvement of household's welfare. The government policies in the past have contributed to the rising agricultural products' price. There are debt relief measures for farmers and low-income housing for the urbanites, universal health care program, self-help village development programs (OTOP, village fund, village investment fund…). These policies have indicated social welfare improvement for the Thais.

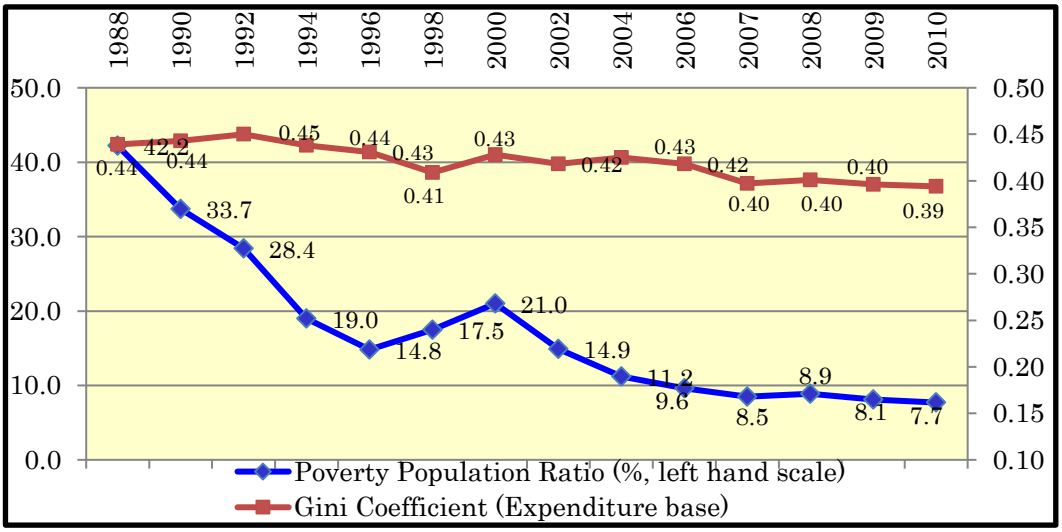
Even though poverty has declined but income inequality was still being worsened. The Gini's coefficients have not been significantly improved over the decades of economic development in Thailand.

Table 2.11: Poverty Line and Income distribution 1988-2010

year	Poverty Line in Baht per Month per person	Population below Poverty Line (%)			Gini's Coefficient (Computed from SES)	
		WHK	Urban	Rural	HH expenditure base	HH Income base
1988	633	42.2	23.7	49.7	0.439	0.487
1990	692	33.7	20.5	39.2	0.443	0.515
1992	790	28.4	12.1	35.3	0.450	0.536
1994	838	19.0	9.9	22.9	0.438	0.520
1996	953	14.8	6.8	18.2	0.431	0.513
1998	1,130	17.5	7.1	22.0	0.409	0.507
2000	1,135	21.0	8.6	26.5	0.428	0.522
2002	1,190	14.9	6.4	18.9	0.418	0.507
2004	1,242	11.2	4.6	14.2	0.425	0.493
2006	1,386	9.6	3.6	12.0	0.418	0.511

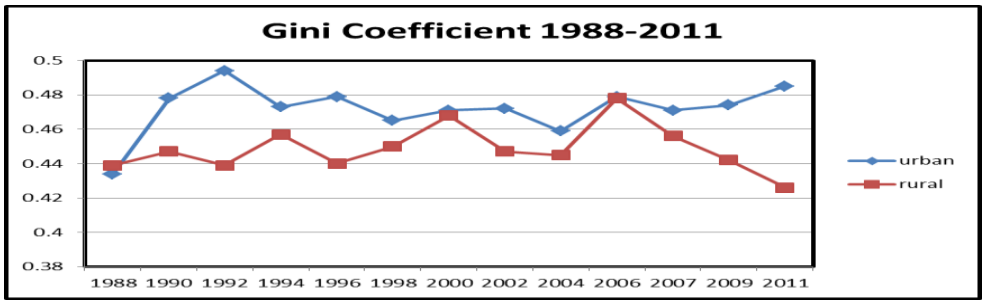
2007	1,443	8.5	3.3	10.7	0.397	0.497
2008	1,579	8.9	3.0	11.5	0.401	・・・
2009	1,586	8.1	3.0	10.4	0.396	0.485
2010	1,678	7.7	2.6	10.4	0.394	・・・
Source: Socio-economic Survey, National Statistical Office, Computed by NESDB						

Figure 2.13: Poverty Ratio and Expenditure Inequality of Households



Source: NESDB, Thai government.

Figure 2.14: Worsen inequality among Urban Households, Improved income inequality among Rural Households (Measured from income base)



Source: NESDB, the Thai government

4. Conclusions

The overall economic development in Thailand during last decades can be concluded as follows:

1) Impressive growth episode during 1960-2000 has reached its frontier as 'middle-income country'. As the new epochal trend of growth was lower than past

record and indicated that Thailand cannot overcome the 'middle-income trap' syndrome.

2) Thailand has shifted her level of capital deepening to be lower than its past trend after the financial crisis. The capital accumulation and population declining trend in terms of 'Total Fertility Rates' and the shortage of labor supply imply that Thailand could not reach her sustainable growth potential in the long-run. If Thailand could raise labor productivity and skills to compensate for labor supply shortage, she would be able to overcome this bottleneck. Unfortunately, insufficient and misled human capital investment in education has resulted in an insufficient 'skill formation' of her human resource. The lack of sufficient competency and qualifications has been constraints for long-run sustained growth.

3) The economic growth in Thailand has been successful in reducing poverty level but still could not overcome income inequality (measured by the Gini's coefficients). The urbanization process may bring about severe inequality than a rural area.

4) The findings mentioned above has justified a study on how to raise productivity and growth through further capital deepening and human capital investment. The clarification of needs of social infrastructure development is an answer to these questions.