Estimation of the National Transfer Account for Thailand in 2006[1]

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This document includes two parts of Thailand NTA 2006 estimation. First presents the sources of data and the data constructed to be the aggregate control. The second part not only presents the method of estimation of the NTA age profile but also present the comparison of the result of the NTA 2006 and the previous year NTA.

1)The Aggregate Control of NTA 2006

In order to construct the aggregate control for Thailand in 2006, the sources of data are National Income of Thailand (NESDB(2007)), Office of the Permanent Secretary of Ministry of Education, Thailand's Budget In Brief FY 2007 of Bureau of Budget and National Health Accounts in Thailand 1994-2001. Data shown in Table 1 is summarized from NESDB (2007). For the Income approach, it presents the compensation of employees and the operating surplus. For the expenditure approach, it presents both public and private consumption expenditure, the net saving, the indirect taxes, the subsidies and the transfers from the rest of the world. However, NESDB (2007) includes the data of education and research as one item for the public consumption. Moreover, NESDB(2007) does not present the data of the housing. Hence, the housing will be estimated as other consumption.

The source of the indirect taxes data which is presented on the left hand side of Table 2 is collected from Thailand's Budget In Brief FY 2007 of the Bureau of Budget. However, Thailand's Budget In Brief FY 2007 presents the import and export duties in one item. Based on the proportion of each of them to the both of them in the year of 2004, each export and import duties in the year of 2006 are estimated. After that by using the aggregate data from Table 1, all items of the indirect taxes are calculated to be the macro control as presented on the right hand side of Table 2.

[1] This document is constructed in order to review all works I have done during participation at the Population, Development, and Policy: A Follow-Up Workshop of The 39th Summer Seminar, Honolulu, Hawaii, June 3 - July 3, 2008. I would like to thank the McArthur Foundation for the financial support. I would particularly like to thank Dr. Andrew Mason, Dr. Karen Mason, Dr. Sang-yhop Lee, Dr. Amonthep Chawla, and Dr. Mathana Phananiramai for providing guidance, knowledge, and supports. I also wish to thank all staffs, and my workshop-mates for help throughout the seminar period.

Table 1. National Income Account of Thailand **(Millions of Baht)**

Income Approach	2006p
Compensation of Employees	**2,245,146**
Operating Surplus	**3,385,808**
Income from Unincorporated Enterprises	2,312,942
Income from Private Corporations and Property	797,544
Property Income	287,536
Less: Interest Payment on Consumer Debt	76,525
Less: Interest Payment on Public Debt	98,467
Saving of Private Corporations	252,947
Corporate Income Tax	414,031
Corporate Transfer Payment	18,022
Income from Public Enterprises and Property	275,322
Government Income from Property and Entrepreneurship	106,154
Saving of Government Enterprises	169,168
National Income	**5,630,954**

Expenditure Approach	2006p
Public Consumption Expenditure	**924,609**
Education and Research	314,329
Health	101,120
Other	509,160
Private Consumption Expenditure	**4,375,478**
Education	44,445
Health	297,754
Other	4,033,279
Net Saving	**1,340,831**
Households	446,487
Corporations	252,947
General Government	472,229
Government Enterprises	169,168
Less: Indirect Taxes	922,019
Subsidies	39,636
Less: Net Public Current Transfers from ROW	6,697
Less: Net Private Current Transfers from ROW	120,884
National Expenditure	**5,630,954**

Sources: National Income of Thailand 2006 Edition (NESDB 2007)

Table 2. Allocation of Indirect Taxes of Thailand (Millions of Baht)

Statistical Yearbooks:	2004	2006*	Macro Control:	2004	2006
Indirect tax on consumption	**537,627**	**951,772**	**Indirect tax on consumption**	**714,729**	**864,722**
Business tax	85		Business tax	113	0
Alcohol tax	60,597		Alcohol tax	80,558	0
Tobacco tax	27,130		Tobacco tax	36,067	0
Petroleum tax	74,581	88,040	Petroleum tax	99,149	79,988
Vehicle tax	54,489		Vehicle tax	72,438	0
Other consumption tax	55,749	309,736	Other consumption tax	74,113	281,407
Excise tax		33,400	Excise tax		30,345
Import duties**	102,561	118,596	Import duties**	136,346	107,749
Value-added tax	162,435	402,000	Value-added tax	215,944	365,233
Indirect tax on production	**46,999**	63,065	**Indirect tax on production**	62,481	57,297
Stamp duties	6,744	7,200	Stamp duties	8,966	6,541
Natural resource tax	18,014	26,840	Natural resource tax	23,948	24,385
Fees and permits	2,146	2,120	Fees and permits	2,853	1,926
Export duties**	263	304	Export duties**	349	276
Specific business tax	19,832	26,600	Specific business tax	26,366	24,167
Total	584,625	1,014,837	**Total**	**777,210**	**922,019**

Source: *Thailand's Budget In Brief FY 2007
National Income of Thailand 2006 Edition (NESDB 2007)

The labor income can be divided into two categories. One is the compensation of employees (2,245,146**)** from Table 1. Another one is the labor share of mixed income which is the two-third of the income from unincorporated enterprises less the imputed rent ((2/3)*(2312942-39936) = 1,515,337).

The NTA simple allocation rule was applied to allocated the indirect to labor income, property income (assets and asset income), and consumption. The result is shown in Table 3. And all data from Table 1 and Table 2 are summarized to be the structure of the public flow account shown in Table 4.

Table 3 Transfer Outflow Allocation of Thailand 2006 **(Millions of Baht)**

Transfer Outflows	Total	Labor Income	Assets and asset income	Consumption
Net Outflow of Taxes, Subsidy, Social Contribution, and Current ROW	1,514,554	743,521	292,593	503,320
Taxes on production and imports	922,020	279,128	139,564	503,328

Table 4 Structure of Public Flow Account of Thailand 2006 (Millions of Baht)

Public Transfers			
Net Public Transfers			0
Public Transfer Inflows			1,059,877
	In-kind Transfer Inflows	924,609	
	Cash Transfer Inflows	135,268	
Public Transfer Outflows			-1,059,877
	Taxes and Grants Transfers	-1,514,554	
	Surplus(+)/Deficit(-)	454,677	
Public Asset-based Flows			
Public Asset-based Reallocations			-472,229
	Asset Income		0
	Less: Public Saving [1]		472,229

2)<u>The Age Profile of the NTA 2006</u>

Due to the time constraint, only the upper part of NTA2006, the life cycle deficit, and the public transfers are done. The estimation mainly utilizes the data from Socio-Economic Survey (SES) 2006, NESDB (2007) and the population data from the United Nation (UN).

2.1 Life Cycle Deficit

2.1.1 Labor Income (YL)

Labor income consists of two sources of incomes: the compensation of employees, which composes of earnings and fringe benefits, and labor's share of the mixed income, which is the self-employment income. To estimate the age profile of labor income in Thailand, the individual level of earning from wages and salaries (record 13), earning from business, industry, or profession other than farming (record 14), and farm operation (record 15) reported in SES (2006) are used.

From record 13, the wage income (YL1) includes the earning from wage and salaries (iw12), the overtime, bonus and others (iw13), and total value of welfare received from employee (iw14). From record 14, the profit from business (Profit) is calculated from the share of the net profit of the business by multiplying the share (ib11/100) to the net profit (ib08-ib09). From record 15, the profit from farm operation (FProfit) is calculated by subtracting all cost of operation including the estimated rental value of the land (ia24+ ia25+ia26+ ia27) and the value of animals at the first day (ia19), from all farm income including the income from rented work animals/tool and compensation from agricultural (ia08+ia09+ia10), the value of harvested crops (ia11), value of livestock (ia15), value of fishery and hunting (ia20). The share of labor income is the two-third of profit from business and farm operation. The data includes all people's first and second job. And the estimation process drops the outliers and drop people who has negative profit.

The mean of earning from wage and salaries is estimate as the weighted mean of the individual's income who is the employee (hm37 equals 1 or 2 or 3 or7). The self-employment income is estimated as the weighted mean income of the share of labor income allocated to the member of family who reports himself as not the employee (hm37 equals 4 or 5 or 6) The following is the Stata code for the labor income estimation.

```
egen employ_income= rsum( YL1i  Profit FProfit)
replace employ_income=0 if employ_income==.
gen employees=(hm37==4 | hm37==5 |hm37==6)& age90>=15
gen selfemp=(hm37==1 | hm37==2 |hm37==3 | hm37==7)& age90>=15

gen wage_income = employ_income if employees==1
gen selfe_income = employ_income if selfemp==1
replace wage_income=0 if wage_income==.
replace selfe_income=0 if selfe_income==.
```

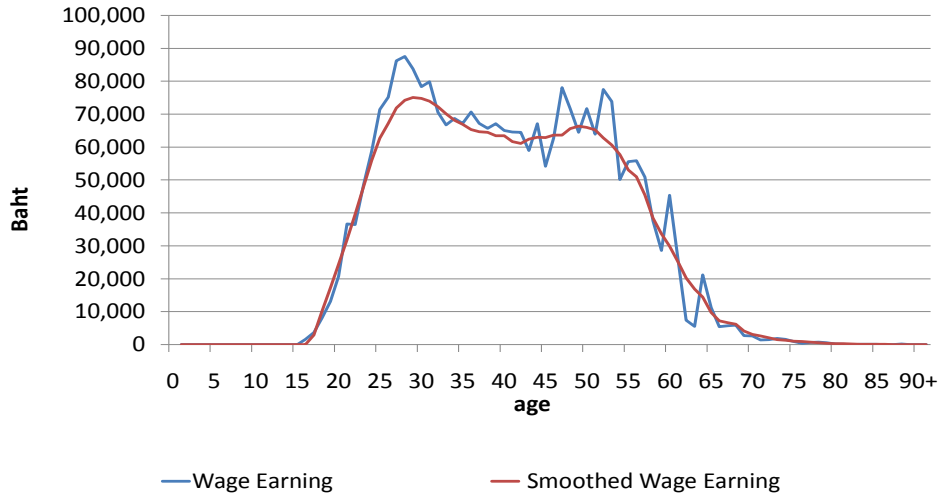
```
replace selfe_income=selfe_income/3*2

egen mean_wage_income=mean(wage_income), by(age90)
replace mean_wage_income=0 if mean_wage_income==.

egen hh_wage_income=sum(mean_wage_income), by( reg cwt amp tmb area ed blk psu_no hhno)
egen hh_selfe_income=sum(selfe_income), by( reg cwt amp tmb area ed blk psu_no hhno)
replace hh_wage_income=0 if hh_wage_income==.
replace hh_selfe_income=0 if hh_selfe_income==.

gen share_selfe_income=(mean_wage_income/hh_wage_income)*hh_selfe_income
replace share_selfe_income=0 if share_selfe_income==.
table age90 [aw= weight], c(mean wage_income  mean share_selfe_income )
```

The weighted mean of wage earnings (wage_income) and self-employment income (share_selfe_income) are smoothed by using the R-program with 0.1 spanned and using the national population as their weight. Since SES 2006 reports the people's occupation of age over 14 years old. Hence the labor income is smoothed by R-program from age over 14 years old. The age profiles of both wage earnings and self-employment income are constructed by using the national population age distribution and controlling them with their aggregate value (the compensation of employees (2,245,146**)** for wage earnings and the labor share of mixed income (1,515,337) for self-employment income). To generate the actual labor income, the indirect taxes on production and imports allocated to the labor income is added up to YLE and YLS. Then, the adjust factor is obtained by dividing the total labor income and taxes with the total labor income. Then, multiply both age profile of the labor income with the adjust factor. The age profiles of total labor income (YL) consisted by the wage earnings (YLE) and the self-employment income (YLS) are the value already adjusted by the indirect taxes.

Figure 1-3 show the smoothed per capita wage earnings (YLE) and smoothed employment income (YLS) and smoothed labor income (YL) with their per capita values before smoothing. Figure 4 combines all smoothed per capita labor income. The age profile of the labor income yields the two-peaks shape because of the two-peaks shape of the per capita wage earnings. The first peak appears in very early age at around 28 years old. Then, the labor income drops at the prime age and a little bit rises again as the second peak around the age of 48 years old. Comparing the normalized of labor income of year 2006 to some previous years in Figure 5, the labor income profile of all other years do not appear in the two-peaks shape as in 2006. When the per capita wage earnings and per capita self-employment in 2006 are compared with the previous in Figure 6 and 7, the big difference of the labor income of the year 2006 and others is noticed. The shape of the per capita self-employment of the year 2006 is not different from

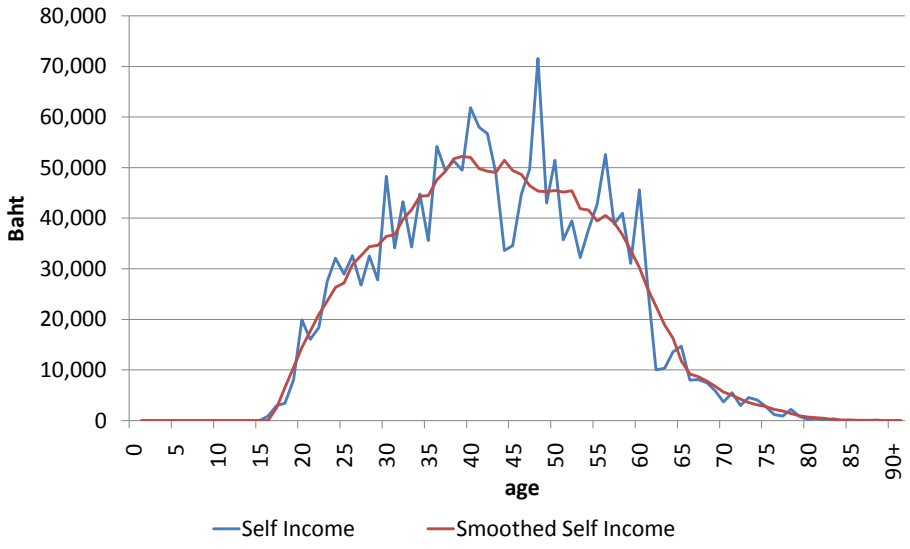
others, but only the peak and the shape up-rises earlier. While the per capita wage earnings of other years have normally single peak, only the per capita wage earnings of the year 2006 has two peaks.

Figure 1 Per Capita Wage Earnings, Thailand 2006



National Transfer Accounts: Thailand

Figure 2 Per Capita Self-Employment Income, Thailand 2006



National Transfer Accounts: Thailand

Figure 3 Per Capita Labor Income, Thailand 2006

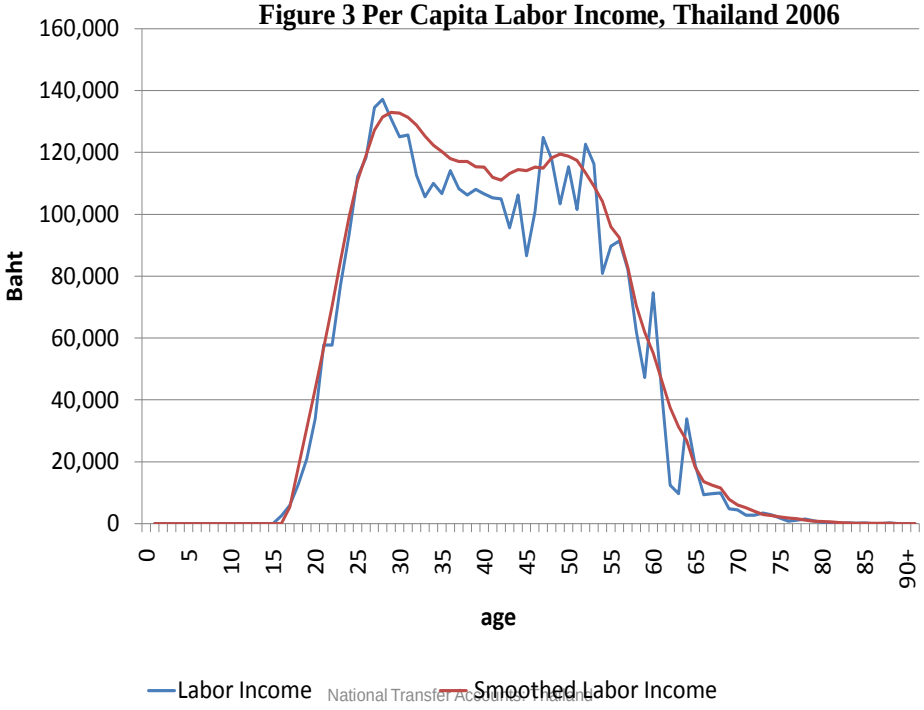


Figure 4 Per Capita Labor income, Wage Earnings and Self Employment Income, Thailand 2006

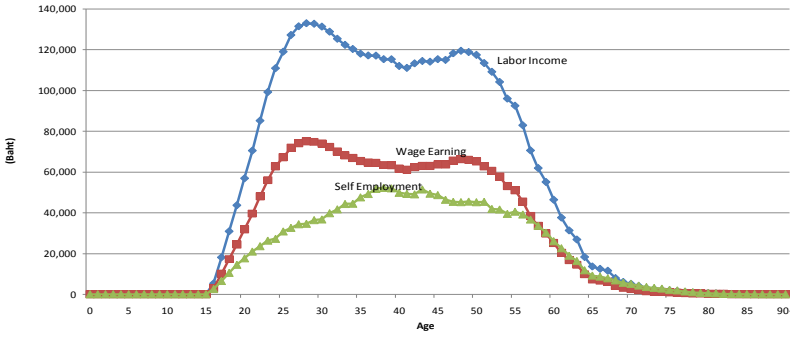


Figure 5 Normalized Per Capita Labor Income, Thailand

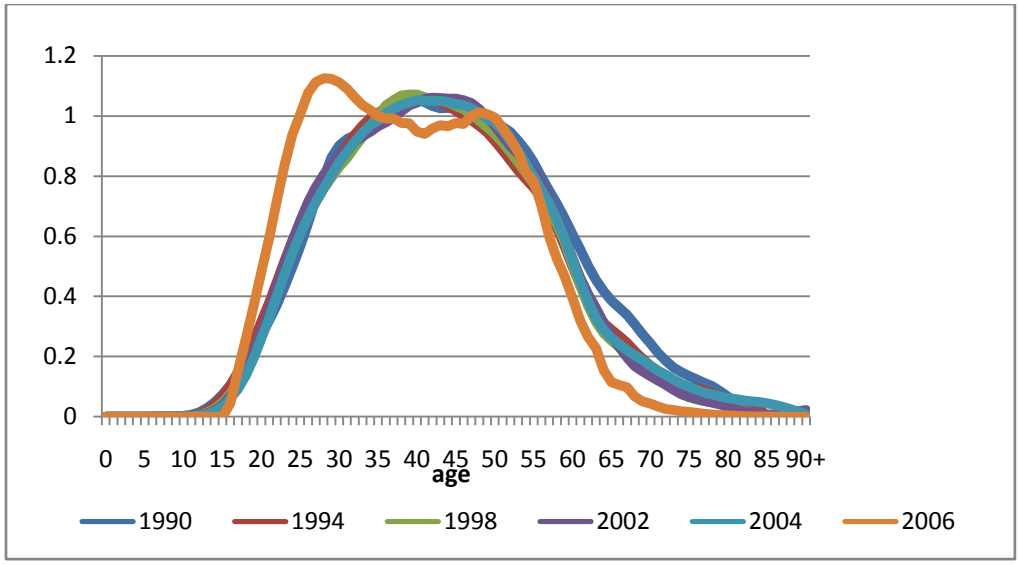


Figure 6 Normalized Per Capita Wage Earnings Income, Thailand

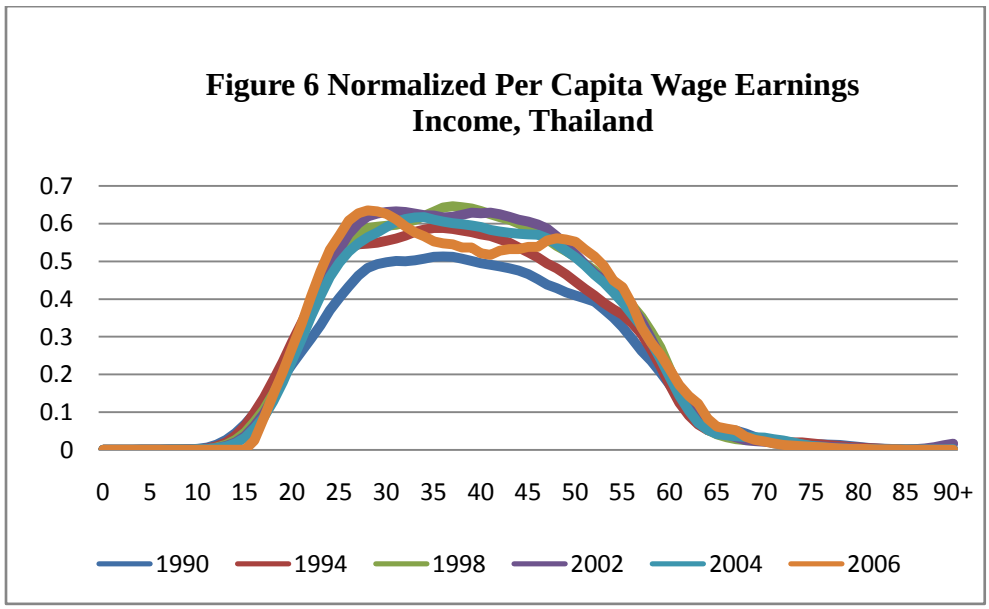
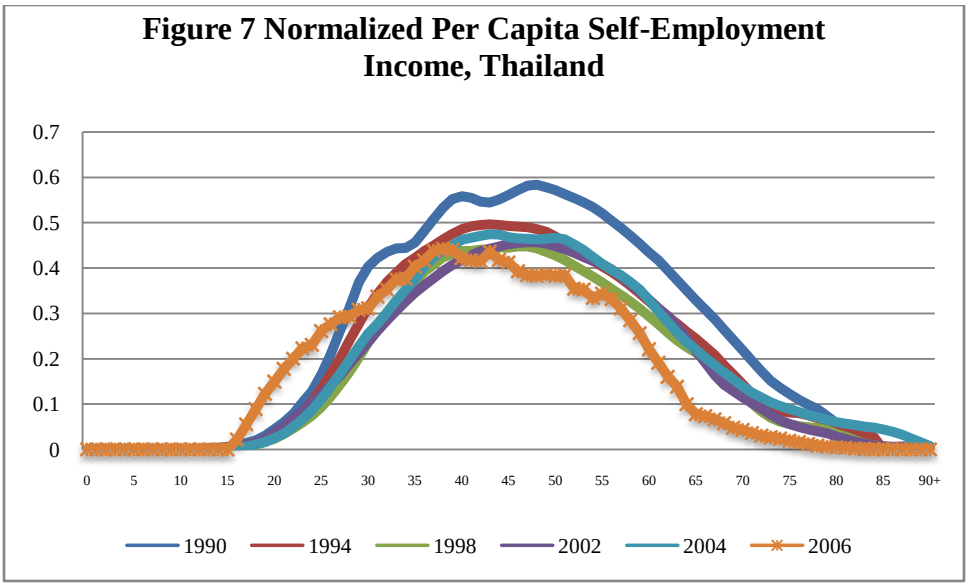


Figure 7 Normalized Per Capita Self-Employment Income, Thailand



2.1.2 Consumption (C)

Consumption consists with the public and the private consumption. Each contains with the education, health and other consumption. The estimations mainly rely on SES 2006, National Health Accounts in Thailand 1994-2001, Office of the Permanent Secretary, Ministry of Education, NESDB (2007) and the population data from the United Nation (UN).

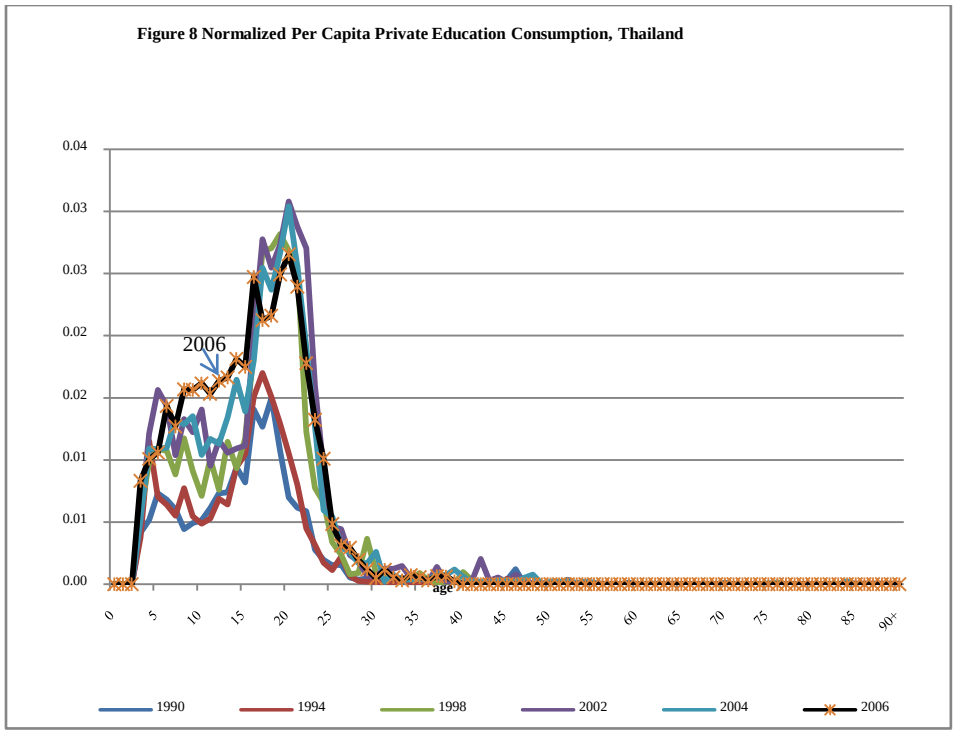
2.1.2.1 Private Consumption (CF)

-Private Education Consumption (CFE)

To estimate the age profiles of the private education consumption, the household level of the education expenses (record 9) reported in SES is used. The education expenses compose of both tuition and school fees for public (eg89) and private school (eg90), text books and school equipment (eg91), special learning course (eg92), and other education expenses (eg93). The regression model is used in order to allocate the education expenses to the household members. The household education consumption is regressed on the number of household members including those aged 3 to 39. The members aged between 3 to 5 are included because even though SES reported that the school enrolled members' age starts from 6 years old, they might get some share of household expenses at the kindergarten level. Then, the model regresses on the number of not enrolled and enrolled household members by each single year from aged 3 to 25 and by group of aged 26-30 and group of aged 31-39, as the following Stata code.

```
gen school=(hm14==1 | hm14==2)
egen   p3   = count(school) if school ==0      & age ==3,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p4          = count(school) if school ==0      & age ==4,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p5          = count(school) if school ==0      & age ==5,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p6          = count(school) if school ==1      & age ==6,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p7          = count(school) if school ==1      & age ==7,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p8          = count(school) if school ==1      & age ==8,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p9          = count(school) if school ==1      & age ==9,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p10         = count(school) if school ==1      & age ==10,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p11         = count(school) if school ==1      & age ==11,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p12         = count(school) if school ==1      & age ==12,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p13         = count(school) if school ==1      & age ==13,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p14         = count(school) if school ==1      & age ==14,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p15         = count(school) if school ==1      & age ==15,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p16         = count(school) if school ==1      & age ==16,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p17         = count(school) if school ==1      & age ==17,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p18         = count(school) if school ==1      & age ==18,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p19         = count(school) if school ==1      & age ==19,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p20         = count(school) if school ==1      & age ==20,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p21         = count(school) if school ==1      & age ==21,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p22         = count(school) if school ==1      & age ==22,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p23         = count(school) if school ==1      & age ==23,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p24         = count(school) if school ==1      & age ==24,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p25         = count(school) if school ==1      & age ==25,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p2630= count(school) if school ==1         & age >=26&age<=30,by(reg cwt amp tmb area ed blk psu_no hhno)
egen        p3139= count(school) if school ==1         & age >=31& age<=39,by(reg cwt amp tmb area ed blk psu_no hhno)
recode p* (.=0)

egen        mp3 =max(p3),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp4 =max(p4),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp5 =max(p5),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp6 =max(p6),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp7 =max(p7),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp8 =max(p8),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp9 =max(p9),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp10 =max(p10),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp11 =max(p11),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp12 =max(p12),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp13 =max(p13),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp14 =max(p14),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp15 =max(p15),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp16 =max(p16),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp17 =max(p17),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp18 =max(p18),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp19 =max(p19),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp20 =max(p20),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp21 =max(p21),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp22 =max(p22),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp23 =max(p23),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp24 =max(p24),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp25 =max(p25),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp2630 =max(p2630),by(reg cwt amp tmb area ed blk psu_no hhno)
egen        mp3139 =max(p3139),by(reg cwt amp tmb area ed blk psu_no hhno)

regress ed_expen mp3 mp4 mp5 mp6 mp7  mp8 mp9 mp10 mp11 mp12 mp13 mp14 mp15 mp16 mp17 mp18 mp19 mp20 mp21 mp22 mp23
mp24 mp25 mp2630 mp3139 if hm01==1 & ed_expen >0 [aweight = weight], noconstant vce(robust)
```

Figure 8 shows the comparison between the private education consumption of the year 2006 and some previous years. The age profile of per capita private education consumption of the year 2006 is not much different from other years' profiles, but a little bit higher expenditure for the secondary level.



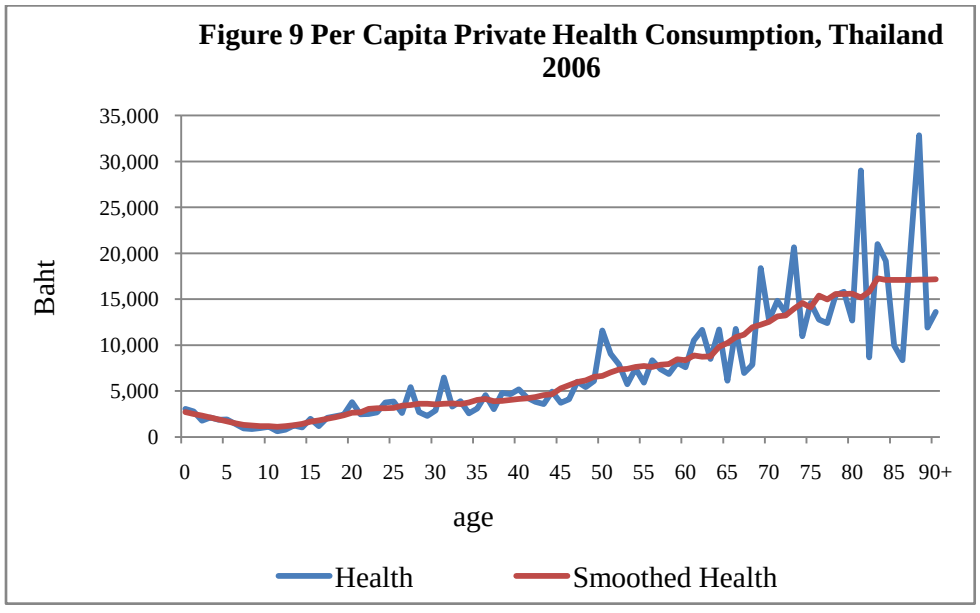
-Private Health Consumption (CFH)

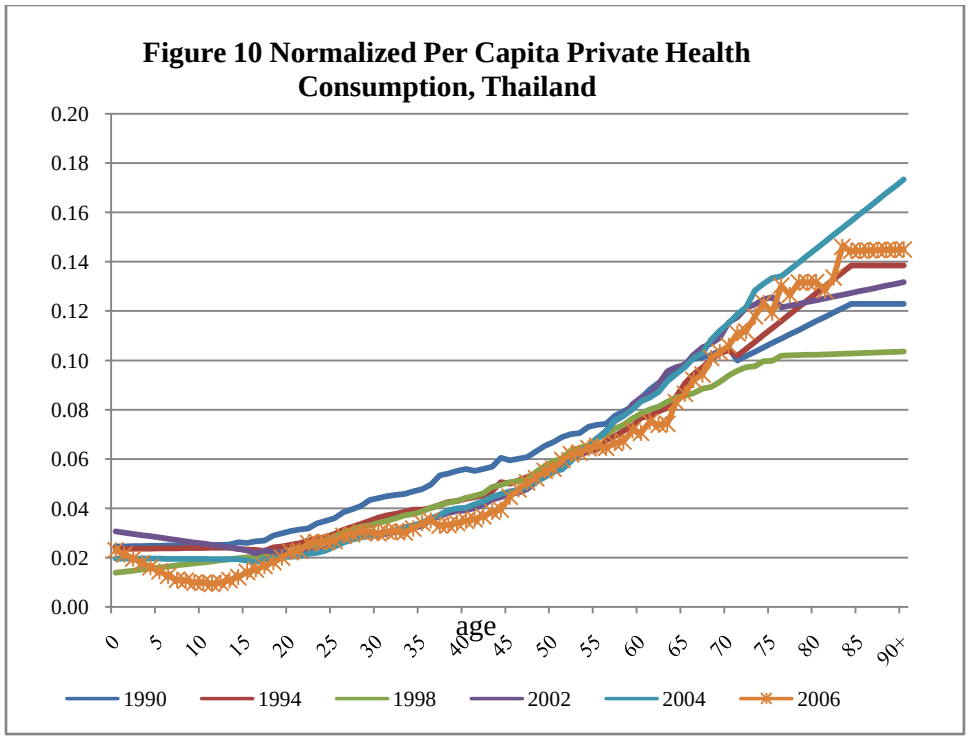
To estimate the age profile of private health consumption, the household level of the health expenditure (record 7) reported in SES is mainly used. The household health expenditure is the summation of the medical and health care (eg 47-eg51), the outpatients medical expenses (eg52-eg57), and the inpatients medical expenses (eg58-eg60). The regression model used in allocation the household health expenses to the household members use the regression model with the cubic method. Since there is no information about the per capita of individual health expenditure of the year of 2006, the per capita value of the year of 2002 is used instead. The following Stata code is used for the estimation.

```
gen a=age90
gen asq=age90^2
gen acub=age90^3
gen a000=age90==0

egen b0=sum(pvhealth02), by( reg cwt amp tmb area ed blk psu_no hhno)
gen b11=a*pvhealth02
egen b1=sum(b11), by( reg cwt amp tmb area ed blk psu_no hhno)
gen b22=asq*pvhealth02
egen b2=sum(b22), by( reg cwt amp tmb area ed blk psu_no hhno)
gen b33=acub*pvhealth02
egen b3=sum(b33), by( reg cwt amp tmb area ed blk psu_no hhno)
gen a00=a000*pvhealth02
egen a0=sum(a00), by( reg cwt amp tmb area ed blk psu_no hhno)
```

```
sort  reg cwt amp tmb area ed blk psu_no hhno

regress health b0 b1 b2 b3 a0 if hm01==1 [aweight = weight], noconstant vce(robust)

gen bb0=_b[b0]
gen bb1=_b[b1]
gen bb2=_b[b2]
gen bb3=_b[b3]
gen x0=_b[a0]
gen health02i=(bb0+bb1*a+bb2*asq+bb3*acub+x0)*pvhealth02

replace health02i =0 if health02i <0
recode health02i (.=0)

egen hhpvhealth02=sum (health02i), by( reg cwt amp tmb area ed blk psu_no hhno)
gen sharepvhealth= health02i /hhpvhealth02
gen indhealth02=sharepvhealth*health

table age90 [aw=weight], content (mean  ind health02 )
```

The weighted mean of the health consumption is smoothed by using the R-program with 0.1 spanned and using the national population as their weight. Then, the age profile of per capita value is calculated by using the national population and is controlled by the private health expenditure from NESDB 2007. Figure 9 shows the smoothed and unsmoothed values of the per capita private health consumption. The age profile of private health consumption confirms the normal pattern that the expenditure is high when the people are young and higher when they are getting old. However, the Figure 10 shows that the private health consumption of the year of 2006 is a little bit lower than other years' profiles.





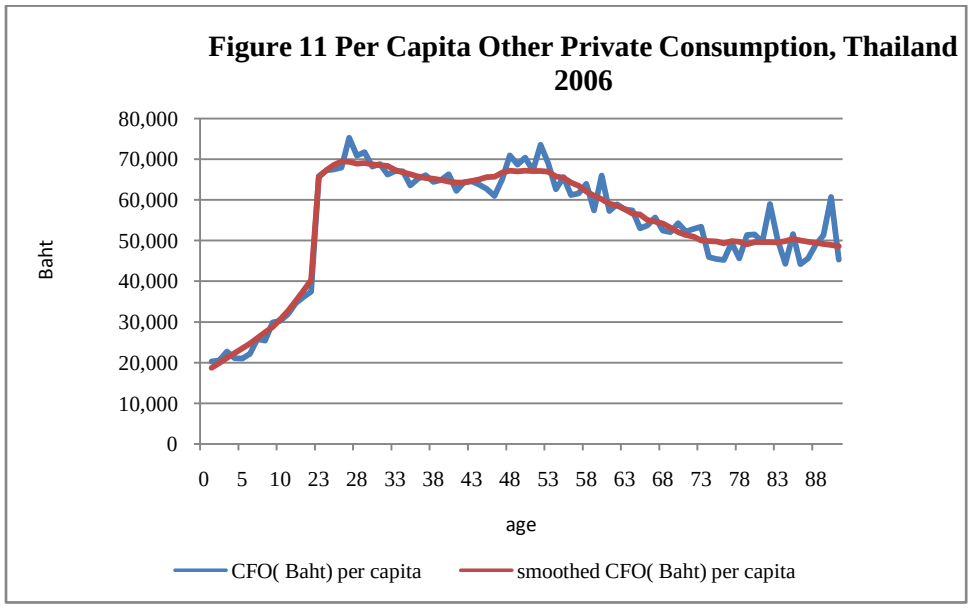
-Private Other Consumption (CFO)

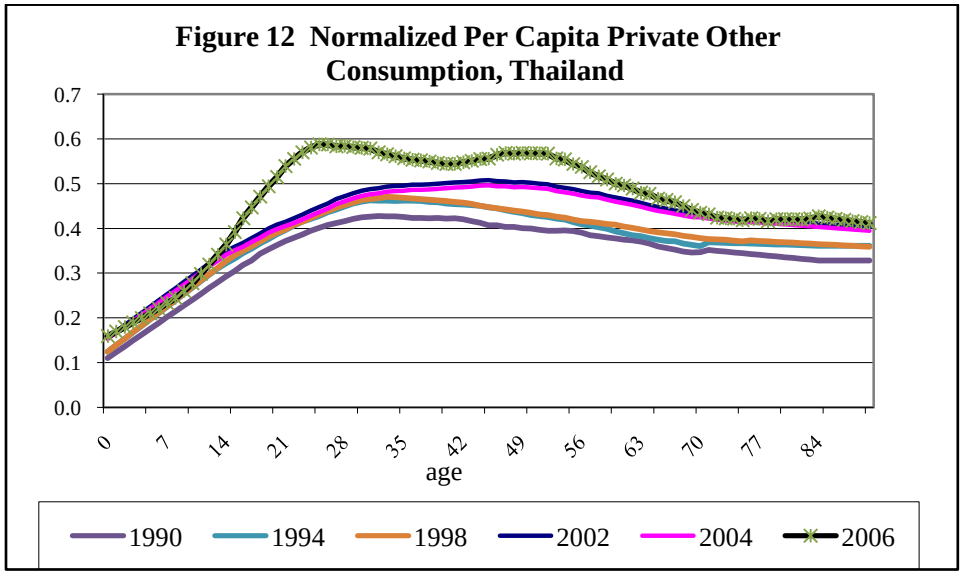
Other private consumption is calculated by subtracting the education expenses and health expenses from all household expenses (con_ex3 + fb_ex3 + tp_ex3 in record 1) reported in SES 2006. The other private consumption is allocated to individual by calculating the weight of consumption of each age as the following Stata code.

```
gen scale = 0.4 if age90 <= 4
replace scale = 0.4+(0.6*(age90-4)/16) if age90 >= 5 & age90 <= 20
replace scale = 1 if age90 >= 21

sort reg cwt amp tmb area ed blk psu_no hhno
egen iscale = sum(scale), by(reg cwt amp tmb area ed blk psu_no hhno)
gen CFOi = (scale / iscale)* other_ex

table age90 [aw= weight], c(mean CFOi)
```

Then, the weighted mean of the private other consumption is smoothed by using the R-program with 0.1 spanned and using the national population as their weight. After it was multiplied by the national population, and controlled by NESDB 2007, the age profile of other private consumption is adjusted by the indirect taxes allocated to consumption. Figure 11 shows the age profile of per capita private other consumption. Figure 12 shows a little bit two-humps

shaped the other private consumption of the year 2006 compared to other years. Those small peaks appear at the age, which are about the peaks of the labor income.





2.1.2.1 Public Consumption(CG)

-Public Education (CGE)

The details of public education expenditure of the year 2006 can be obtained from the Office of the Permanent Secretary, Ministry of Education (1997-2006) as in Table 5. There are

two types of the budget allocation. One is allocated by the level of education and another one is not by the level of education. The methodology of the public education estimation is the following.

1. Allocate the education expenditure amount 314,329 million baht from NESDB 2007 into the same percentage of budget allocation to the student by each level: kindergarten, secondary, higher, the expenditure which is not allocated by level, and others as shown in Table 5.
2. Since the elementary level in the year 2004 got 62.22% of the total budget for elementary and secondary levels, then break the expenditure amount of 216, 595.83 million baht to be 134,782.6 million baht for elementary level and 81813.24 million baht for secondary level. This is c_{1l}.
3. Obtain the number of the student in each level from the Office of the Permanent Secretary, Ministry of Education.
4. For the expenditure which is not allocated to each level, 356.15 million baht, allocate 80.85% of this amount to the primary and the secondary levels, and 19.15% of it to the higher level. Since the information from Ministry Education appears that 62.22% of total budget for the elementary and secondary levels goes to the pre-elementary and elementary, 37.78% goes to the secondary, then, allocate 62% of the expenditure which is amount of 287.9346 (=232.784) to primary level and 37.78% of that amount to the secondary level (=55.15 million baht). Those expenditure equally divided to the student in each level (c_{2l}).
5. Allocate c1l and c2l to student in each level. This means that the expenditure c_{1l} and c_{21} are equally allocated to every students ($c_l = c_{1l}+c_{2l}$).
6. From SES 2006, the percentage of public school enrolment is obtained. For example: 99% of people aged 18 attends the secondary school and 1% of people aged 18 attends the higher education. Then, the student aged 18 received the public expenditure $c_l(18) = c_l(\text{secondary})*0.99+c_l(\text{higher})*0.016$.
7. From SES 2006, the percentage of public school enrolment is obtained. For example, 53% of student aged18 attends the public school. Hence, the people aged 18, receive the public expenditure amount $0.53*c_l(18)$ For the student aged 3-5, from Ministry of

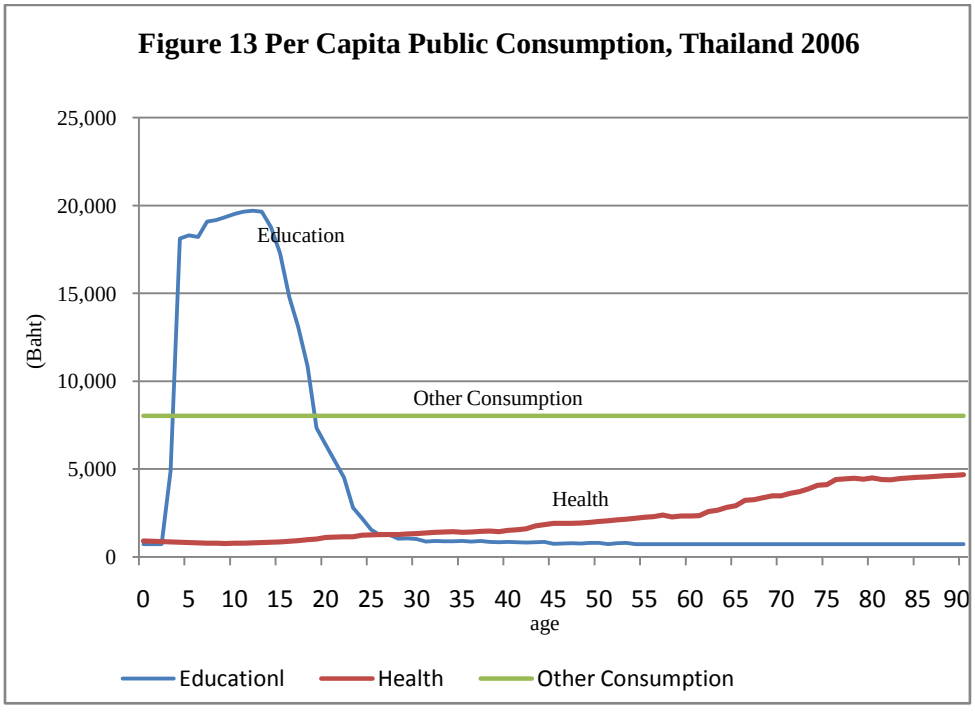
education the percentage of enrollment to population was reported. Then, adjust this number with the proportion of student aged 6 who enrolls in public school, 82%.

8. Multiply the expenditure per head to the number of population each age, and add this amount with the expenditure allocated for every level (equally distribute to everyone), and then controlled by the expenditure to every level (268,267).
9. Combine the result from number (5) and number (8) yields the age profile of public education. (as shown in Figure 13)

Table 5 Education Expenditures by Function: Fiscal Years 1997-2006

Type of expenditure	Budget		Allocation in NI
	Millions Baht	%	
Education			
Kindergarten and Primary and Secondary	203,246.20	68.91	216,595.83
Higher	48,152.30	16.33	51,315.00
Not Allocated by Level of Education	334.20	0.11	356.15
Total expenditure for every level	**251,732.70**	85.35	268,267.02
Services and Support to Education	33,654.90	11.41	35,865.42
Other Types of Education	9,568.10	3.24	10,196.55
Total Other Types	**43,223.00**	14.65	46,061.98
Total	**294,955.70**	100.00	**314,329.00***

Source: Office of the Permanent Secretary, Ministry of Education (1997-2006)
***Research and Education from NESDB (2007)**



-Public Health (CGH)

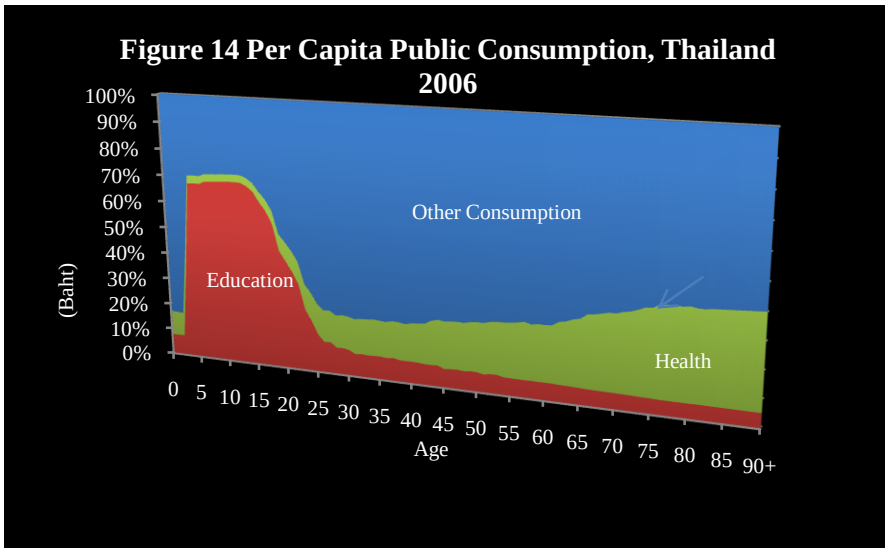
The detail of health expenditure for the year 2006 is not available. However, according to the National Health Accounts in Thailand 1994-2001, about 31 percent of all expenditure of the year 2001 went to the capital formation, administration and other public protections, and about 69 percent went to the inpatients, outpatients, and medicines. Hence, the method of the public health consumption is the following.

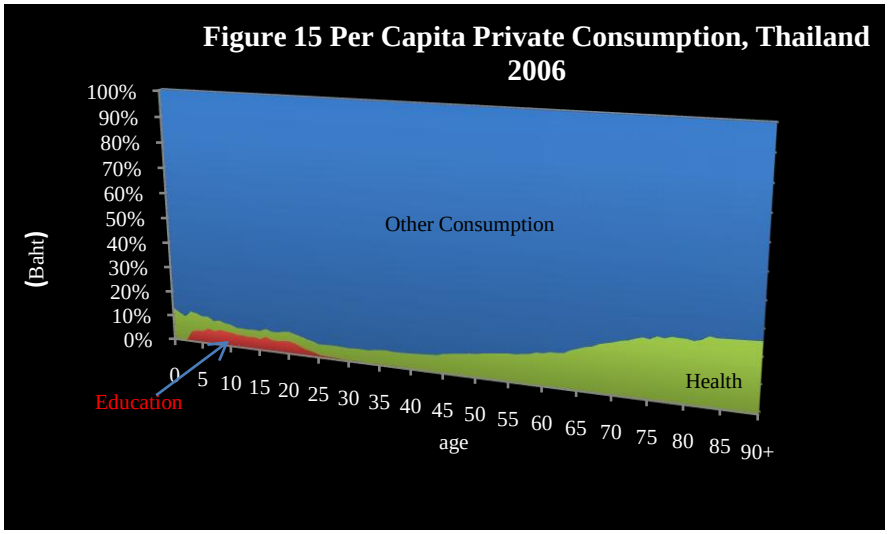
1. Divide the health expenditure from NESDB 2007 ,which is amount of 101,120 million baht, into two part 31:69 percent.
2. First part of the expenditure (Capital +admin+ P&P), which is amount of 31,347.2 million baht, goes to all people as per capita expenditure.
3. The second part of the expenditure (OPD+IP+ medicine), which is amount of 69,772.8 million baht, allocates to people as the age profile, which the private health consumption estimated from SES 2006 is used.
4. The household level of health consumption reported in SES 2006 (record 7) is utilized. The private health consumption in the medical and health care (eg47-eg51), the outpatient expenses in public hospital (eg52), and the inpatient expenses in public hospital (eg58) are estimated. Then, smooth it by R-program with 0.15 spanned. This smoothed result is used as the proxy of public health consumption per head.
5. Multiply the age profile from number (2) with the number of national population, and control it by the public expenditure amount 69,772.8 million baht.
6. The age profile of public health expenditure is obtained by summation the result from number (2) and number (5). The per capita of public education is shown in Figure 13.

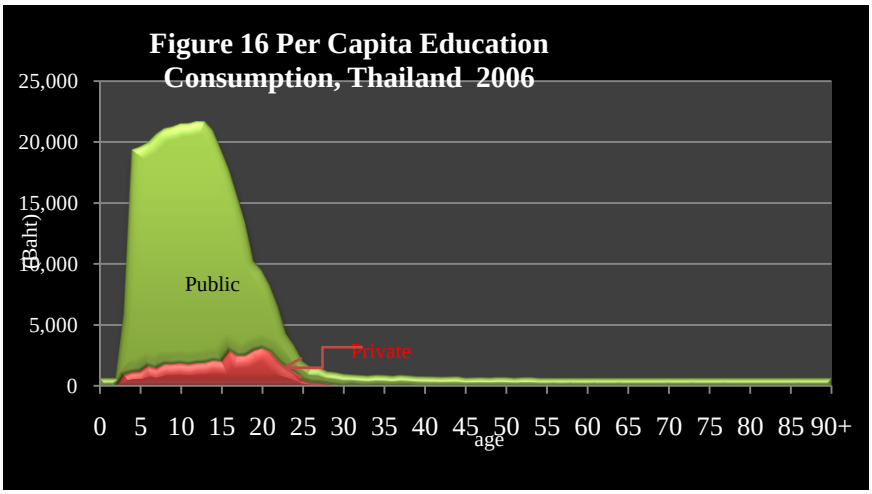
-Public Other Consumption (CGO)

The public consumption other than the education and health is equally allocated to everyone. The amount of other public consumption from NESDB (4,033,279 million baht) is divided by the total national population. Figure 13 also shows the age profile of per capita public other consumption.

Figure 14 shows that in Thailand the highest proportion of public expenditure to the young is for the education. The proportion of the health expenditure increases as the age increases. Figure 15 shows that Thai people spend for the education in a very small proportion to their overall private consumption when they are young, but the most part of education expenditure comes from the government, as shown in Figure 16. They have to spend more for the health consumption when they are getting old. Figure 17 shows that the expenditure from the government contains only about 20 percent of the over-all health expenditure of the old aged people.







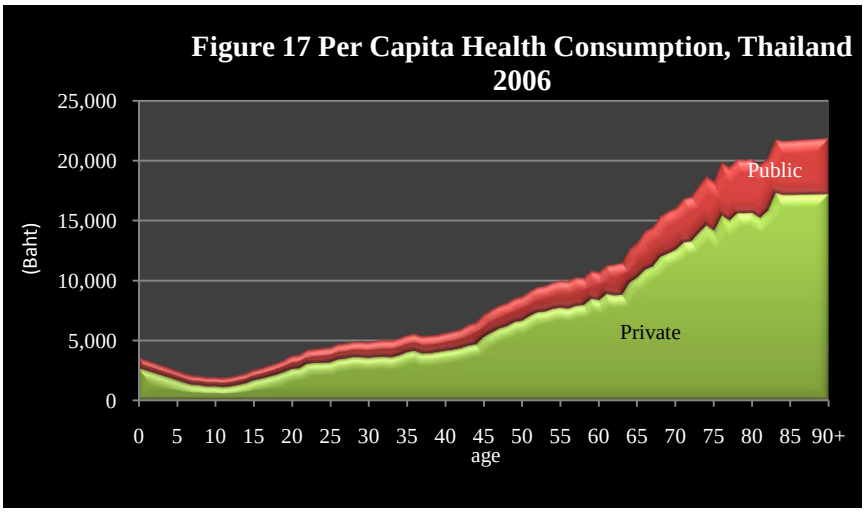
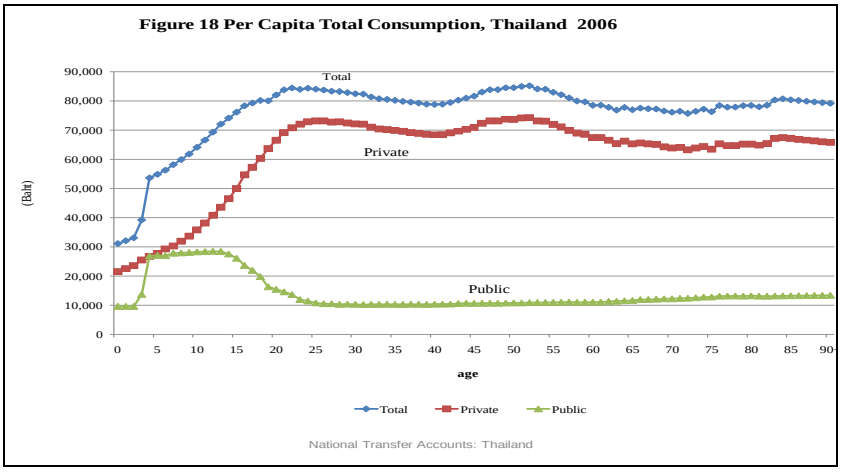


Figure 18 and 19 shows all the age profile of private consumption, public consumption and total consumption. The proportion of consumption from the public is high when the people are young because of the education consumption.



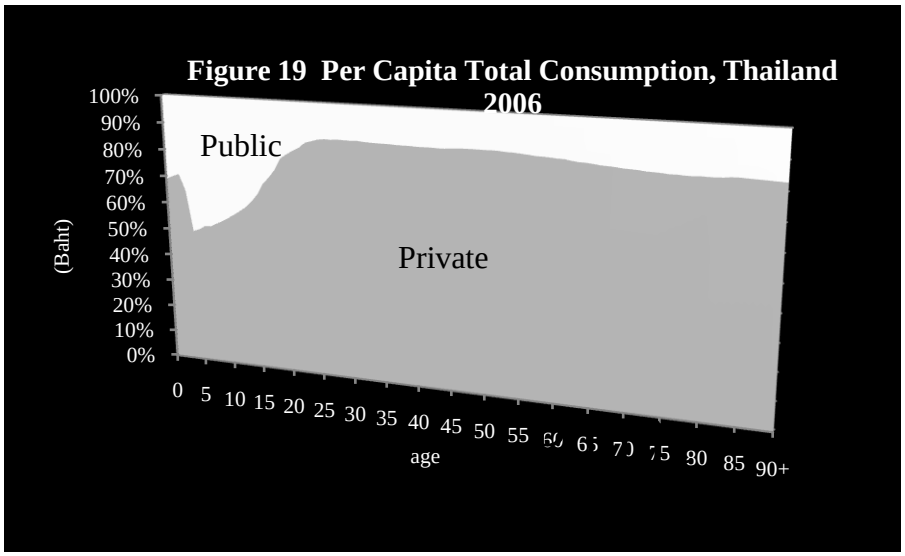
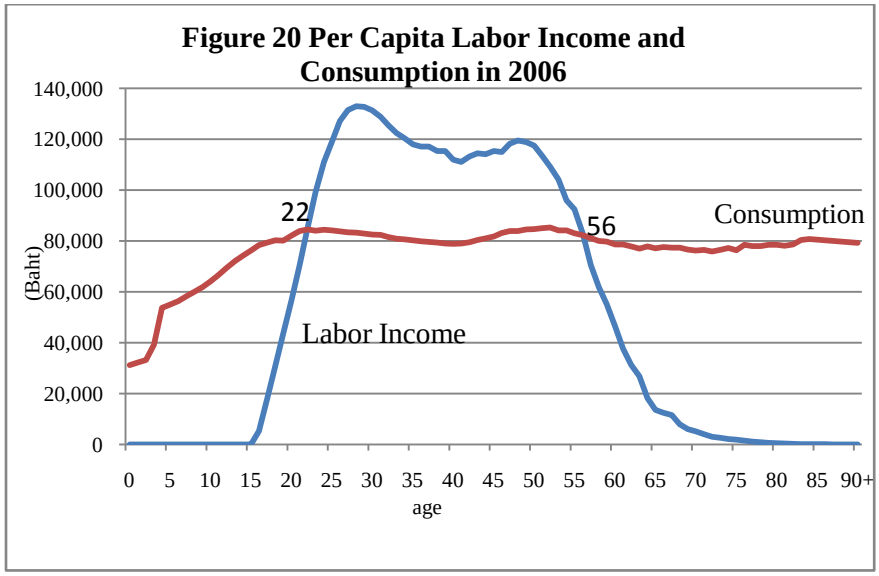


Figure 20 shows the age profile of per capita labor income and the consumption. Figure 21 and Figure 22 show the age profiles of per capita and aggregate of life cycle deficit, respectively. Figure 23 shows the comparison of life cycle deficit of various years. The shape of the age profile of per capita life cycle deficit of the year 2006 is quite different from the previous years' LCDs. The age of starting surplus and end of surplus are not much different from the previous years' LCDs. The surplus of the year 2006 is a little bit earlier than the previous years'LCDs, starting from aged 22. The end of surplus is also earlier than other years (ends at aged 56).



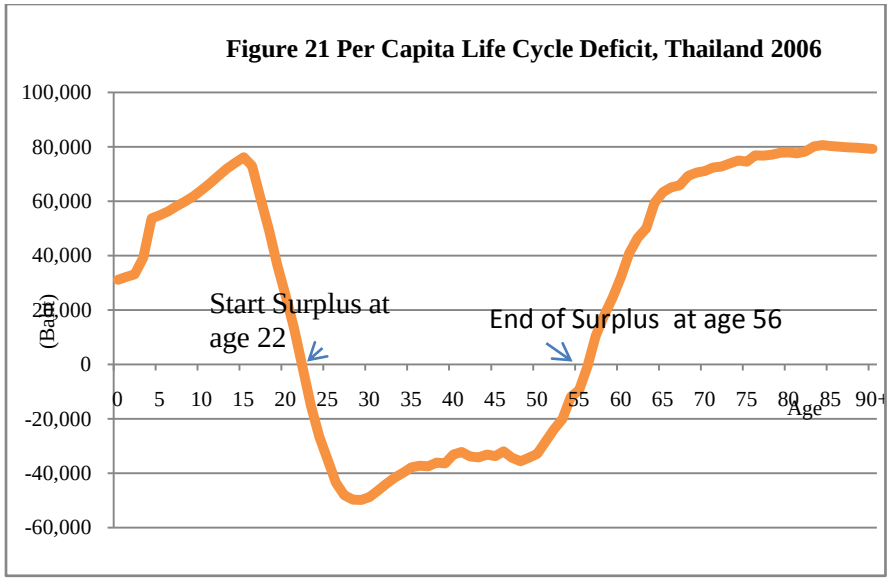


Figure 21 Per Capita Life Cycle Deficit, Thailand 2006
100,000
80,000
60,000
40,000
20,000
0
-20,000
-40,000
-60,000
(Baht)
Start Surplus at age 22
End of Surplus at age 56
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age

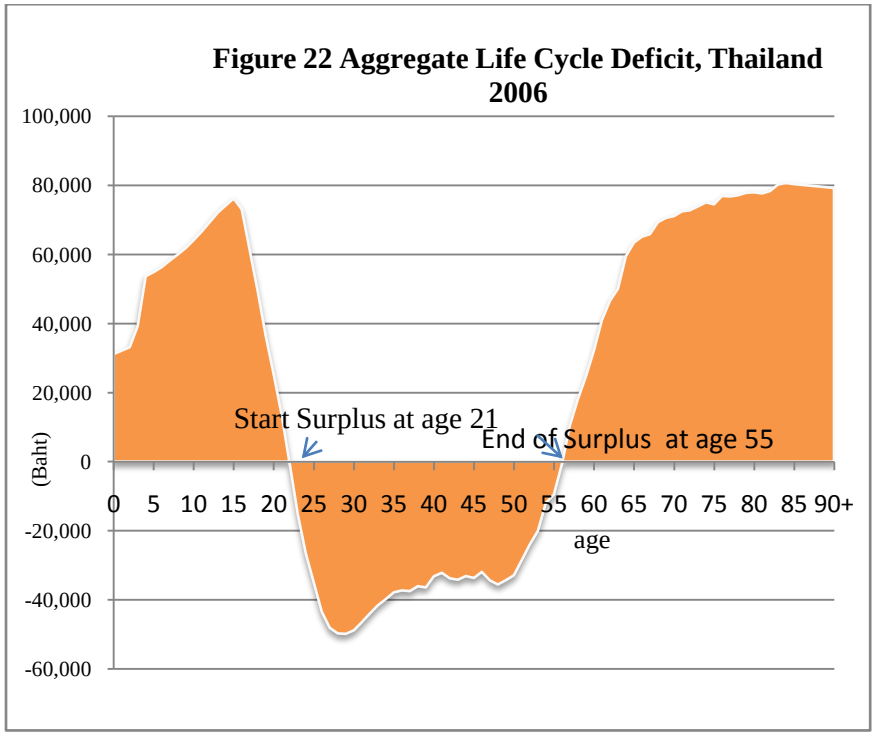
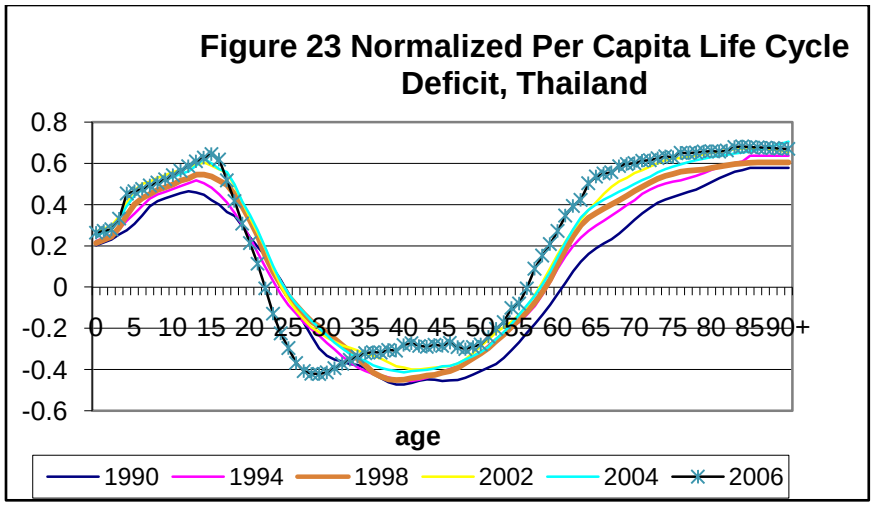


Figure 22 Aggregate Life Cycle Deficit, Thailand 2006
100,000
80,000
60,000
40,000
20,000
0
-20,000
-40,000
-60,000
(Baht)
Start Surplus at age 21
End of Surplus at age 55
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
age



2.2 Public Transfer consists of inflow and outflow. For this part, the estimation is not completed due to the time limited during the seminar. Only some items are constructed for the age profile. During the workshop, both cash and inkind transfer for the inflow are estimated. But for the outflow, only the age profile of general taxes and the surplus are estimated. Not total outflow is estimated.

2.2.1 Inflow

Public inflow consists of the inkind-transfer and cash inflow. The inkind-transfer is the government expenditure (CG). The cash inflow , which is amount of 135,268 million baht, is the transfers to the individuals including the Social Security Benefits and other cash transfers. The total inflow of the year 2006 is 1,059,877 million baht. Due to the time constraint and the information about the cash transfers is not available, the cash inflow is equally allocated to all population.

2.2.2 Outflow

Public outflow consists of two parts. One is the taxes and grants which is amount of 1,514,554 million baht. This part includes both direct and indirect taxes less subsidy, social security contribution, and non-taxes including the net transfer to the rest of the world. Another part is the surplus/deficit, which is the difference of the inflow and the taxes and grants. The amount of surplus in the year 2006 is 454,677 million baht (1,059,877- 1,514,554).

The age profile of general taxes and grants composes with three parts. One is the taxes and grants allocated to the labor income. To estimate this part, the smoothed age profile of labor income is utilized, and controlled with the total amount of taxes and grants to the labor income (743,521). The second part is the taxes and grants allocated to the consumption. To estimate this part, the smoothed age profile of other private consumption is used as the proxy of the private consumption profile, and controlled with the total amount of taxes and grants to the consumption (292,592). The third part is the taxes and grants allocated to the property income (assets and asset income). To estimate this part, the household level data of income from rent (io08 of record 16), interest and dividend (io10+io11 of record 16), and the imputed rent (ad01 of record 17) from SES 2006 are used. The weighted mean of the head of household's asset income is estimated. After it was smoothed by R-program with 0.1 spanned and controlled by the taxes and granted to this part (503,320), the age profile of the property income tax is obtained. Figure 24 shows all per capita age profile allocated to labor income, consumption, and property income. The proportion of all taxes profile, as shown in Figure 25, presents the higher property income tax when the age of people increases. However, when the people are very old the highest proportion of the tax-paying is the taxes charged to their consumption. Figure 26 shows the age profile of aggregate taxes from each source.

The age profile of the general taxes and grants (as shown in Figure 24), which is combined by the taxes and grants to the labor income, consumption, and property income, is utilized to allocate the surplus. The difference of the general taxes and grants and the surplus yields the age profile of net taxes outflow because the general taxes and grants profile is greater than the surplus. Figure 27 shows the age profiles of per capita general taxes and grants, transfer surplus, and net taxes. Figure 28 shows the age profiles of aggregate general taxes and grants, transfer surplus, and net taxes. Finally, the age profile of the net transfer, which is the difference between the inflow and outflow, is estimated. Figure 29 and Figure 30 show the age profiles of per capita inflow-outflow-net transfer and the aggregate profile, respectively. Figure 31 and Figure 32 show the age profiles of per capita and aggregate of net public transfer, respectively. The net transfer to the young is high due to the high public education consumption. Even though the public transfer inflow increases as the age increases, the outflow of transfer due to the property tax is higher as the age increases. Hence, the net public transfer to the old-aged people is not high. The net transfer is positive around aged 70.

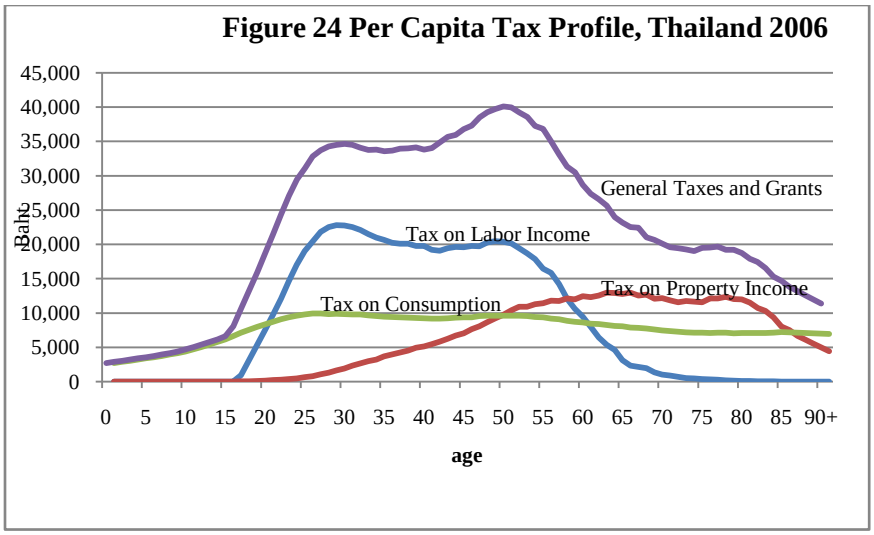


Figure 24 Per Capita Tax Profile, Thailand 2006
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Baht
General Taxes and Grants
Tax on Labor Income
Tax on Property Income
Tax on Consumption
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
age

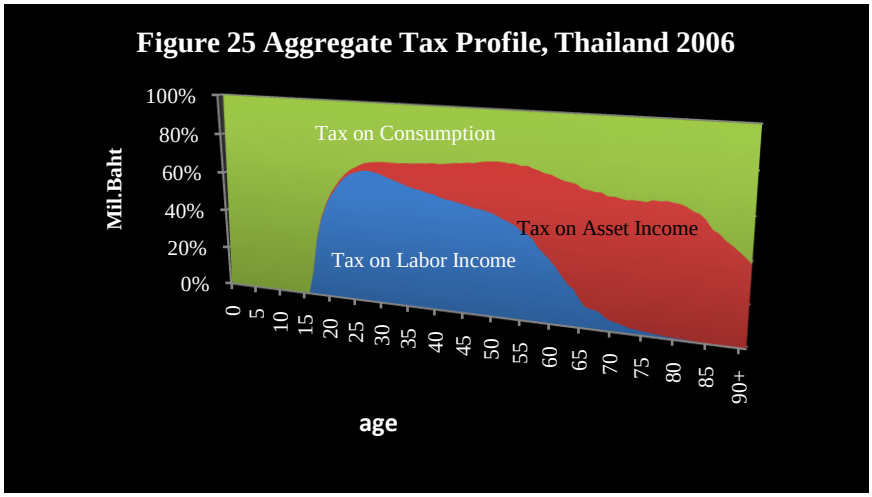


Figure 25 Aggregate Tax Profile, Thailand 2006
100%
80%
60%
40%
20%
0%
Mil.Baht
Tax on Consumption
Tax on Asset Income
Tax on Labor Income
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
age

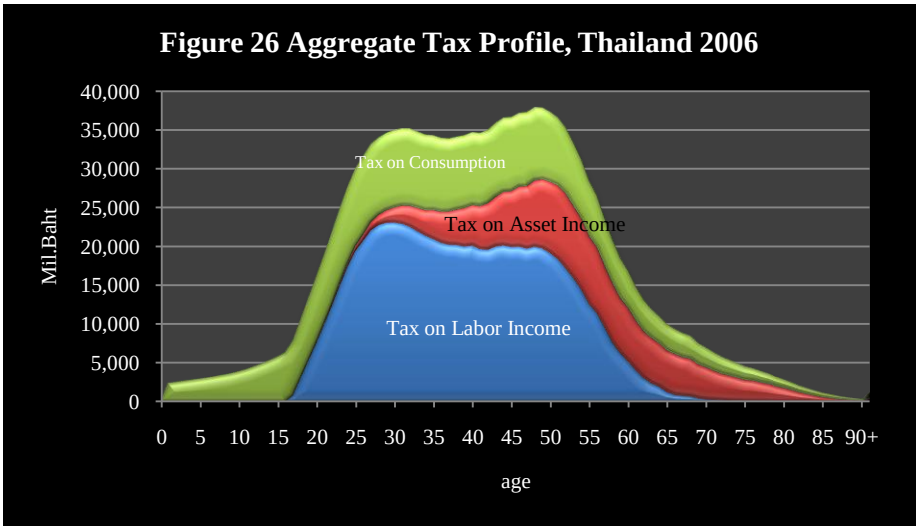


Figure 26 Aggregate Tax Profile, Thailand 2006
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Mil.Baht
Tax on Consumption
Tax on Asset Income
Tax on Labor Income
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
age

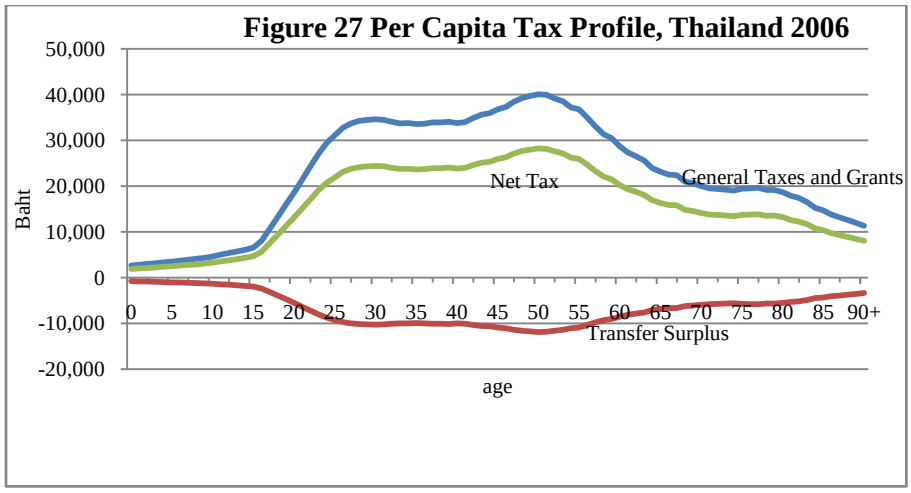


Figure 27 Per Capita Tax Profile, Thailand 2006
50,000
40,000
30,000
20,000
10,000
0
-10,000
-20,000
Baht
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
age
Net Tax
General Taxes and Grants
Transfer Surplus

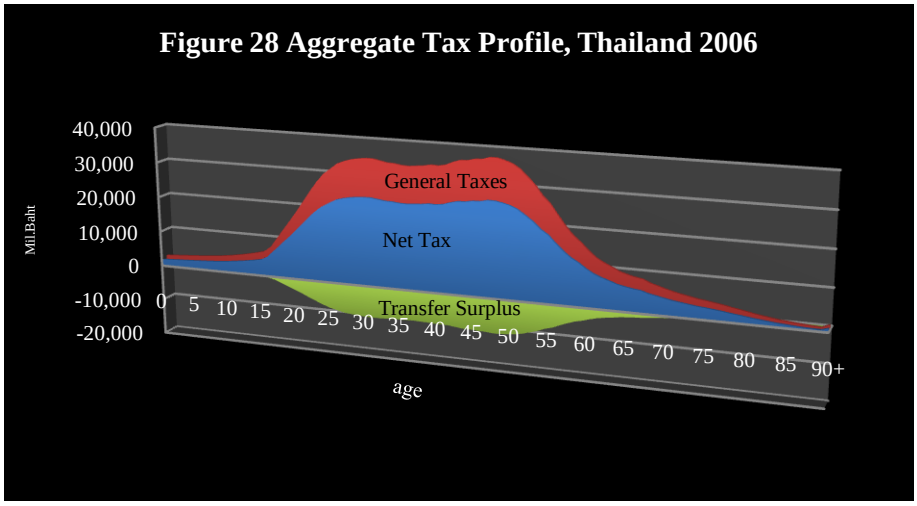


Figure 28 Aggregate Tax Profile, Thailand 2006
40,000
30,000
20,000
10,000
0
-10,000
-20,000
Mil.Baht
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
age
General Taxes
Net Tax
Transfer Surplus

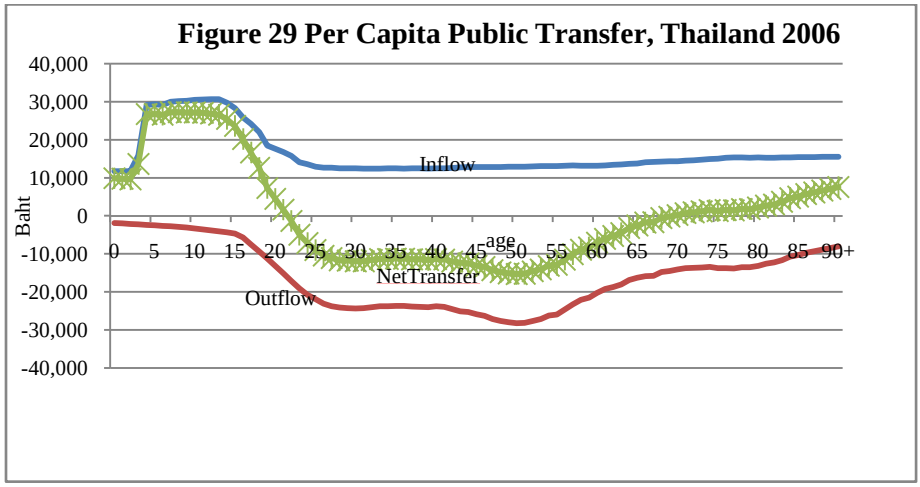


Figure 29 Per Capita Public Transfer, Thailand 2006
40,000
30,000
20,000
10,000
0
-10,000
-20,000
-30,000
-40,000
Baht
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
age
Inflow
NetTransfer
Outflow

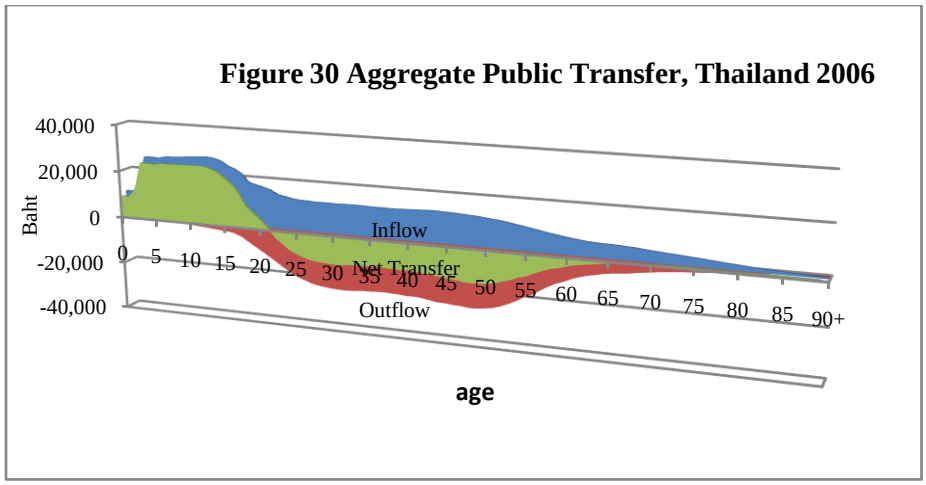


Figure 30 Aggregate Public Transfer, Thailand 2006
40,000
20,000
0
-20,000
-40,000
Baht
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Inflow
Net Transfer
Outflow
age

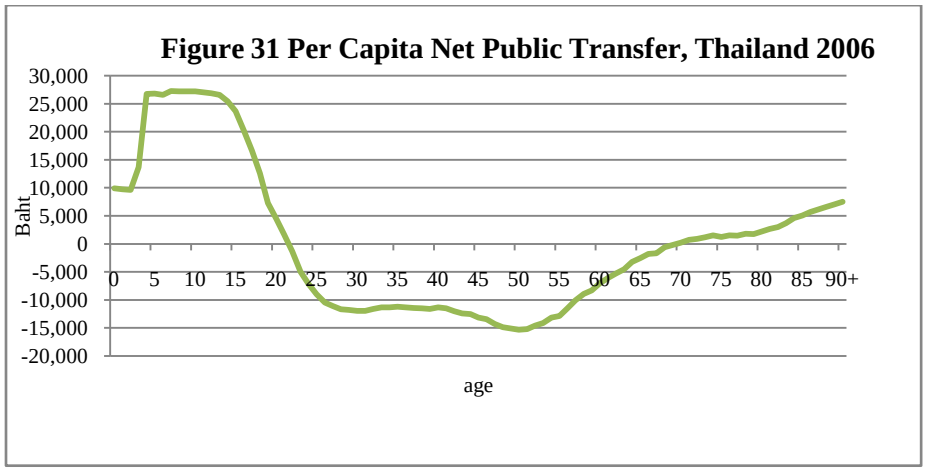


Figure 31 Per Capita Net Public Transfer, Thailand 2006
30,000
25,000
20,000
15,000
10,000
5,000
0
-5,000
-10,000
-15,000
-20,000
Baht
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
age

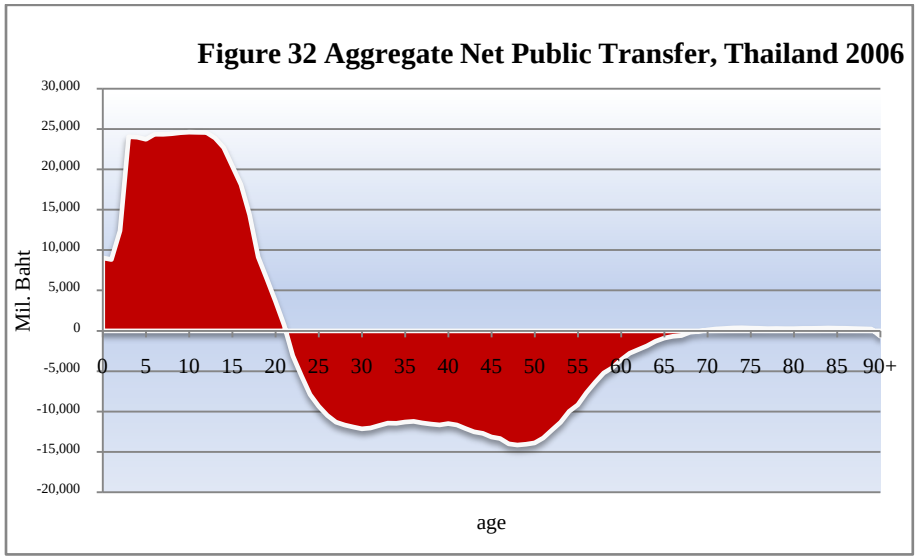


Figure 32 Aggregate Net Public Transfer, Thailand 2006
30,000
25,000
20,000
15,000
10,000
5,000
0
-5,000
-10,000
-15,000
-20,000
Mil. Baht
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
age

Further Work

1) To complete the public transfer, the allocation of cash inflow must be studied. The allocations of both inflow and outflow have to be corrected. The public transfer age profile should be reconstructed.
2) The shape of the age profile of labor income has to be reinvestigated.