

Aggregate Control and Public Sector in NTA

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Outline

- I. Public Sector in NTA
- II. Aggregate Control
- III. Public Accounts

I. Public Sector in NTA

 the public sector-

an intermediary that compels
reallocations across age groups
and/or across time.

Coverage of Public Sector

- By #4.112 of SNA, "the general government sector consists of the following group of resident institutional units:
 - (a) All units of central, state or local government;
 - (b) Social insurance funds at each level of government
 - (c) All non-market NPIs that are controlled and mainly financed by government units.
- Public enterprises or profit-making activities (e.g., monopoly) are not included.
 - ✿ Q: China as an exception?

Public and Private Sectors in NTA

Lifecycle Deficit

Consumption

Private

Public

Less: Labor Income

Lifecycle Reallocations

Asset Reallocation

Assets Income (private+public)

Less: Saving (private+public)

Transfers

Private

Public

Two Main Sectors in NTA

NI



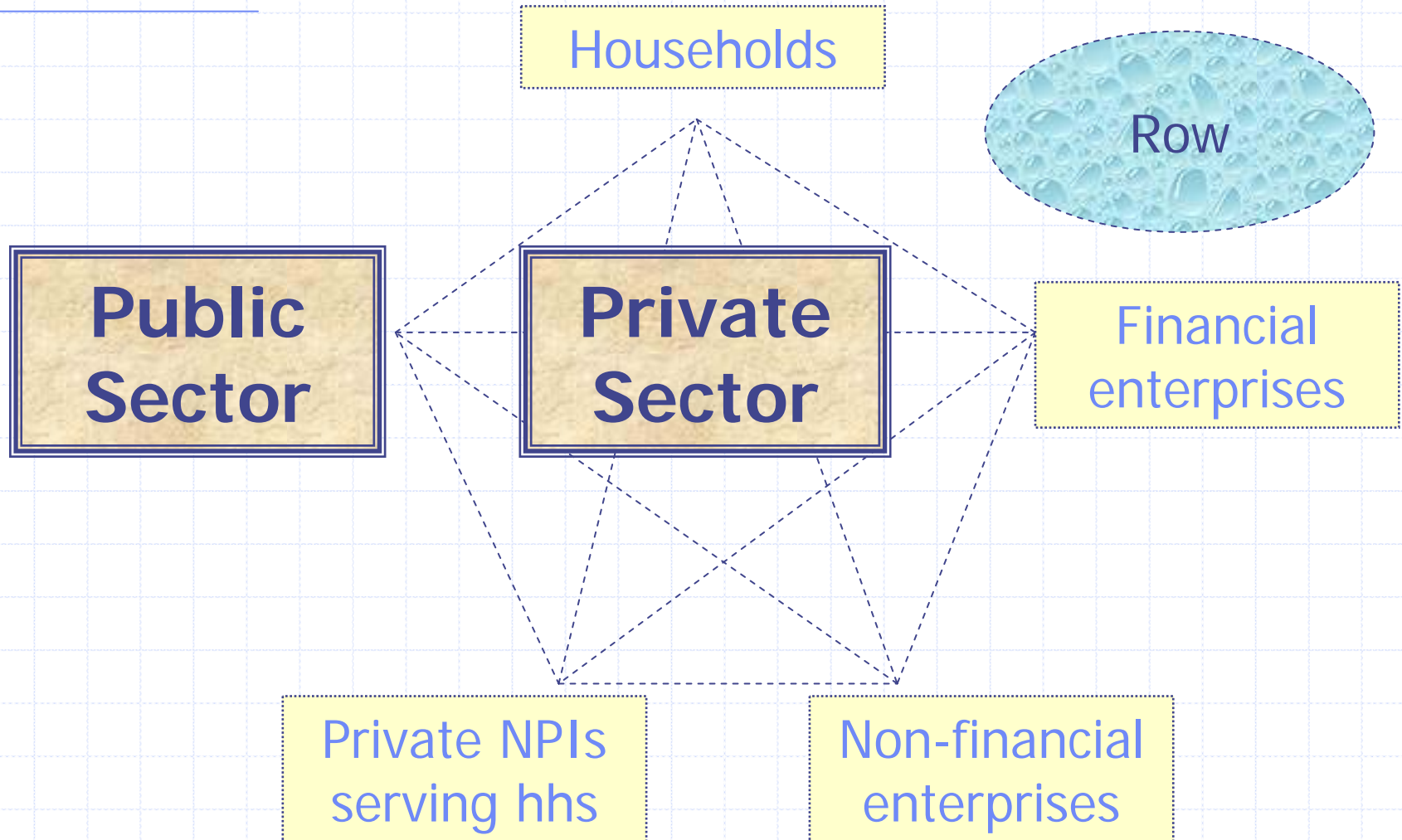
**Public
Sector**

FIES

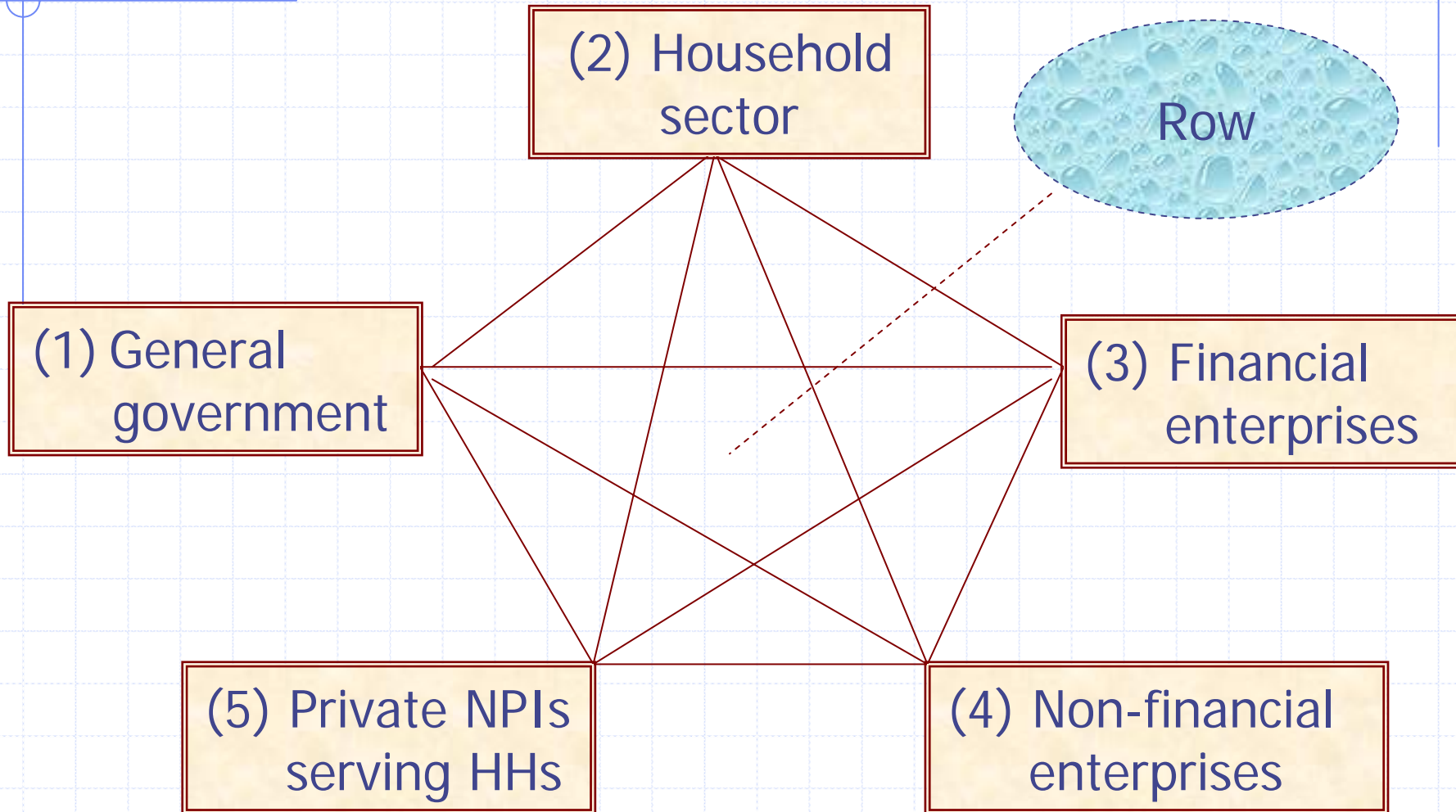


**Private
Sector**

Institutional Units in NTA



Institutional Units in NI








Six Institutional Units in NI

NI sectors	NTA data source
1. The general government sector	NI, aggregates
2. The household sector	FIES, individual
3. The financial corporations sector	
4. The non-financial corporations sector	
5. The non-profit institutions serving households sector	
6. Rest-of-World	NI, aggregates

II. Aggregate Controls

General Guideline

-  Use NI figures as aggregate control variables
-  Rearrange NI terms into NTA format
-  Use NNP figures
 -  $NNP = GNP - \text{depreciation}$
 -  $GNP = GDP + \text{overseas income of nationals}$
 - factor cost paid to foreigners

Aggregate Controls (2)

What for?

- ✿ To adjust individual data in FIES to aggregate data in NI
- ✿ To account for non-HH private sectors, which does not appear in FIES
(Q: should we consider incorporating the enterprises directly?)
- ✿ To account for ROW

NTA and NI

same economic concept

- ✿ production in the economy is equal to the income earned, and is equal to total spending.

consistency

- ✿ NTA aggregates are equal to NI
-

yet different welfare concerns

- ✿ NTA: by individual or by age group
- ✿ NI: national aggregates

NTA Identity


$$\underbrace{(C_{f,i} + C_{g,i}) - Y_{L,i}}_{\text{lifecycle deficit (LD)}} = \underbrace{(Y_{A,i} - S_i)}_{\text{asset reallocation}} + \underbrace{(T_{f,i}^+ - T_{f,i}^-)}_{\text{private transfer}} + \underbrace{(T_{g,i}^+ - T_{g,i}^-)}_{\text{public transfer}}$$

net transfers

lifecycle reallocation

i : individual or age group

NI Identity


$$C + I + G \underbrace{(+X - M)} = Y_L + Y_A$$

some adjustment needed for open economy—shown later

From NI to NTA

$$\text{NI: } C + I + G = Y_L + Y_A \quad (1)$$

$$\sum_i [C_{f,i} + I_i + C_{g,i} + T_{f,i}^- + T_{g,i}^-] = \sum_i [Y_{Li} + Y_{Ai} + T_{f,i}^+ + T_{g,i}^+] \quad (2)$$

(given that $\sum_i [T_{f,i}^+ + T_{f,i}^-] = 0 = \sum_i [T_{g,i}^+ + T_{g,i}^-]$)

NTA: (assuming $I=S$, and rearrange terms)

$$(C_{f,i} + C_{g,i}) - Y_{Li} = (Y_{Ai} - S_i) + (T_{f,i}^+ - T_{f,i}^-) + (T_{g,i}^+ - T_{g,i}^-) \quad (3)$$

From NTA to NI

$$(C_{f,i} + C_{g,i}) - Y_{Li} = (Y_{Ai} - S_i) + (T_{f,i}^+ - T_{f,i}^-) + (T_{g,i}^+ - T_{g,i}^-) \quad (4)$$

$$Y_{Li} + Y_{Ai} + T_{g,i} + T_{f,i} = C_i + S_i \quad (5)$$

$$\underbrace{Y_L + Y_A}_{\text{need adjustment}} + \underbrace{T_g + T_f}_{\text{directly drawn from NI}} = \underbrace{C + G + S}_{\text{directly drawn from NI}} \quad (6)$$

need adjustment

directly drawn from NI

directly drawn from NI

Main Items to Adjust

- proprietor's income
- depreciation
- net export
- indirect taxes
- Medicare/NHI, and pension programs
- statistical discrepancy

Proprietor's Income

- NTA: Entrepreneurial income, self-employment...
- NI: operating surplus (in Taiwan, net of asset income), proprietor's income (in US) ...
- Rule: $\frac{2}{3}$ to Labor Income, $\frac{1}{3}$ to Asset Income

Net Exports

● To take care of ROW:

current account (=net export + net factor income from abroad
+ net unilateral transfer from abroad)

+ capital account (net increase in foreign ownership of domestic
assets)

= balance of payments (if positive, an increase in foreign reserves)

● Net Exports=

- net compensation of employees from ROW Y_L
- net prop & entrp income from ROW ...proprietor's income
- net transfers from ROWtransfers
- net borrowing from ROW net savings

Depreciation

- To take care of Savings:
- Saving = Gross Investment
 - Depreciation
 - Net borrowing from ROW

Indirect Taxes

Consumption related taxes:

- ✿ by equivalent scale, or age profile of specific commodities (e.g., tobacco), ...
- ✿ e.g., Import duties, VAT, ...

(Issue: Tax incidence fell on those who pay:

What about Taiwan, with small % of consumer goods imports—13% in 1998, 8.2% in 2004?)

Asset related taxes:

- ✿ By age profile of asset income

Social Insurances

reallocate to public in-kind benefit

(1) deduct the social insurance benefit from Private Consumption

(2) reallocate as a government in-kind benefit

other issues

✿ If the imputed benefits of social insurances appear in private consumption (in FIES), it should be removed (as in the case of Taiwan)

✿ The aggregate is separately estimated from other sources, such as National Health Accounts...


Statistical Discrepancy

- Adjust income and indirect figures proportionally
- see website-methodology-aggregate controls- US example

Other Variables

- Other variables can be drawn directly, or calculated from results above.
- e.g., $\text{Private } C = \text{Health (out-of-pocket)}$
 - + Education (out-of-pocket)
 - + other consumptions

more example

 Y_L = compensation of employees (incl. labor earning, employer provided benefits—bonus, housing, social insurance premium...)

+ 2/3 of proprietor income

+ indirect taxes allocated to labor income

+ net compensation from ROW

 Y_A = returns to assets (interest, dividends, rents)

+ 1/3 of proprietor income

+ indirect taxes allocated to asset income

- subsidy

Intra-household Transfer

- By definition, intrahousehold transfer sums to zero for each household. And national total is zero.
- The aggregate controls are derived from the main variables used to estimate intrahousehold transfers.
- The adjustment factor differs by variable, but is invariant by age, individual and household

YL, labor income	The aggregate value of labor income is estimated using compensation of employees, household operating surplus, indirect taxes and import duties. Refer equation (1.7).
TGCash, public cash transfers	Includes pension, health insurance, social assistance and any other public cash. Each type of the cash transfers are adjusted separately for the aggregate control.
TGTax, public tax	All the taxes paid by individuals.
TPB, interhousehold transfers	If we assume that the income survey is representative, we use the aggregate value from the household survey. Otherwise, we use a proxy adjustment factor from other income or expenditure variable.
CC, current consumption	Three different adjustments are made separately for this current consumption: Education, health and other consumption.
CD, durable consumption	Imputed rental value of owner-occupied housing and the flow of services from consumer durables.

IV. Public Accounts

- Public Consumption:
 - Education, Health, Other public C
 - Social insurances
- Public Asset Income
- Public Savings
- Public Transfers (to Private)

Inflow and Outflow

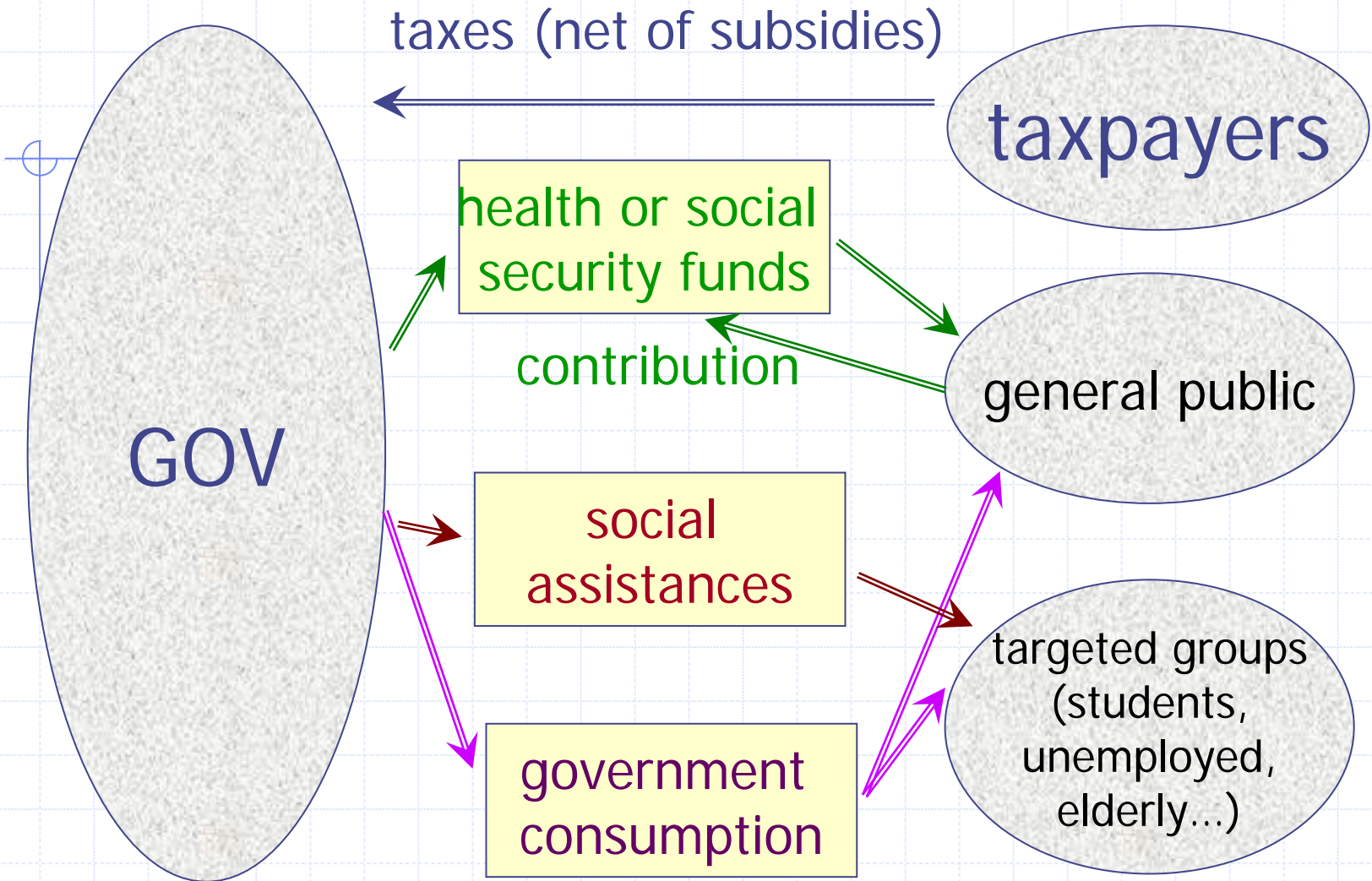
- inflows = in-kind transfers + cash transfer + social insurance benefits
- outflows = taxes + social insurance premiums
- budget deficits = inflow - outflow
(surpluses = outflow - inflow)

Allocating to Age Groups

- For Public accounts, we allocate the aggregates to different ages.
- Note that in the estimation of private sector accounts, we begin with individual data and then perform aggregate controls.

Age Reallocation

- Age reallocations occur as beneficiaries of such programs belong to different age groups from the taxpayers who fund them.



Outflows of Public Transfer

Taxes...



- The age pattern of the outflows depends on how the programs are financed - the age variation of the economic resource being taxed and the age variation in the rate of taxation.
- Some programs are financed by dedicated sources (e.g., property taxes in the US are used to finance public education), others are by general taxes. In Taiwan, for example, there are virtually no dedicated taxes.

Taxes



- Generational accounting (GA) assumes that the incidence of the tax falls on the entity that pays the tax: payroll taxes are paid by workers, sales tax by consumers, property tax by owners of property, and so on (Auerbach and Kotlikoff 1999).
- We follow the GA methods, but with some modifications.

Types of Taxes

Direct taxes

-  personal and corporate income taxes
-  estate and gift tax, financial transactions tax, land tax, other property tax...

Indirect taxes

-  custom duties, sales tax, license tax, ...
-  monopoly profits,...

Fines and regulatory expenses

-  treated as direct taxes

Subsidies

-  treated as deductions from indirect taxes

**Direct Taxes

- personal (and corporate) income taxes
- estate and gift tax, land tax, other property tax, ...
 - allocated according to
- financial transactions tax, ...

Allocating Direct Taxes




- Direct taxes (and regulatory expenses) are levied according to taxpayers' own declaration on labor income or property income.
 - Obtain the aggregate figure from macro sources.
 - Get age profile of direct taxes from income and expenditure surveys.

Inflows of Public Transfers

Cash transfers

-  social assistance,...

In-kind transfers (from Government Consumption)

-  public education
-  national defense, administration, ...
-  Social insurances

Cash Transfers

- Cash public transfer inflows are typically targeted and often vary substantially with age.
- E.g., Old-age Farmer's Welfare Allowance Program (1995-) in Taiwan

Allocate Cash Transfers

- If age pattern of beneficiaries can be decided from income surveys or other sources,
 - ✿ allocate the aggregate figure according to the age distribution of income level, age, ethnicity, ...
- Otherwise (or for simplicity)
 - ✿ allocate on per capita basis

In-kind Transfers

- Administration, defense, public health, ...
 - ✿ Allocate on per capita basis in the same way as untargeted cash transfers
- Education
 - ✿ Allocate to enrolled students

Estimating Education

- Question: Is government final consumption spent only, or mostly, on public schools?
 - ✿ If yes, the figure is allocated on public school students. Otherwise, it is allocated to all students.
- Need the following data
 - (1) enrollment rate by school level (and by age)
 - (2) education expenses by school level

Social Insurances

- National Health Program
- National Pension Program
- For both programs, we need to find out the age distribution of beneficiaries (and contributors).

National Health Program

- Need the following statistics
 - Aggregate total
 - Age distribution of contributors
 - Age distribution of beneficiaries
 - By age
 - By amount

Example: Age Pattern of Beneficiaries

Year 2001			
age group			
0—4	11,718	45—49	1,405,285
5—9	25,511	50—54	1,037,632
10—14	36,073	55—59	588,997
15—19	183,024	60—64	500,439
20—24	1,018,085	65—69	392,495
25—29	1,604,543	70—74	391,199
30—34	1,600,092	75—79	262,535
35—39	1,644,471	80—84	132,526
40—44	1,561,169	85+	70,153

National Pension System

- National Pension Program
 - Need the age profiles of contributors and beneficiaries.
 - Not yet implemented in Taiwan, but there are Labor Insurance, Government Employee Insurance, ...
- (Q: Do we consider these pension systems?)

Social Insurances Programs in Taiwan

	program
A1.	Government Employee Insurance (GEI)
A2	Retired Government Employees Insurance (RGEI)
A3	Health Insurance for Government Employees' Dependents (HIGED)
A4	Health Insurance for Retired Government Employees (HIRGE)
A5	Health Insurance for Spouses of Retired Government Employees (HISRGE)
A6	Insurance for Teaching and Administrative Staffs of Private Schools (IT ASPS)
A7	Insurance for Retired Teaching and Administrative Staffs of Private Schools (IRT ASPS) until 1985.6; Health Insurance for Retired Teaching and Administrative Staffs of Private Schools (HIRT ASPS)
A8	Health Insurance for Spouses of Retired Teaching and Administrative Staffs of Private Schools (HISRT ASPS)
A9	Health Insurance for Dependents of Teaching and Administrative Staffs of Private Schools (HIDT ASPS)
A10	Insurance for Government Employees and Teaching and Administrative Staffs of Schools (GEI)
B	Labor Insurance (LI)
C	Farmer's Health Insurance (FHI):
D	Servicemen's Insurance (SI)

Allocating Direct Taxes

- Asset-related taxes
- Income taxes
- Fees, fines and other taxes