Theory of Social Accounting

Part 2

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Introduction

- *An Introduction to Social Accounting Matrices*
- *Structure of a SAM*
- Macro-SAM and National Accounts Matrix
- The Production Boundary and Price System
  - Complete and Consistent
  - The SNA Production Boundary
  - Price System in a SAM
- *Interpreting the Information in a Social Accounting Matrix*
- *Inter-Industry Tables and SAMs*
- *Satellite accounts*

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Social Accounts and Information

*"[I]t is **impossible** to establish by direct estimation a system of national accounts free of statistical discrepancies, residual error, unidentified items, balancing errors and the like since the information available is in some degree **incomplete**, **inconsistent** and **unreliable**. Accordingly, the task of measurement is not finished when the initial estimates have been made and remains incomplete until final estimates had been obtained which satisfy the constraints that hold between their true values."*
(Stone, 1982, p 186, emphasis added).

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Macro-SAM and National Accounts Matrix

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National Accounts Matrix

	Commodities	Activities	Generation of Income	Allocation Primary Income	Secondary Dist'n of Income	Use Disposable Income	Capital	GFCF	Financial	Rest of World, Current	Rest of World, Capital
Commodities	Margins	Intermdediate Inputs	0	0	0	Consumption Expenditure	Changes in inventories	GFCF	0	Exports of G&S	0
Activities	Production	0	0	0	0	0	0	0	0	0	0
Generation of Income	0	Net Value Added, Production taxes	0	0	0	0	0	0	0	Compensation from RoW Employees	0
Allocation Primary Income	Taxes & Subsidies on Products	0	Net Generated Income (BP)	Property Income	0	0	0	0	0	Property Payments, taxes and subsidies	0
Secondary Dist'n of Income	0	0	0	Net National Income	Current transfers	0	0	0	0	Current transfers from RoW	0
Use Disposable Income	Commodity Taxes	0	0	0	Disposable net Income	0	0	0	0	0	0
Capital	0	0	0	0	0	Net Savings	Capital transfers	0	Net Insurance liabilities	0	Capital transfers from RoW
GFCF	0	Consumption of Fixed Capital	0	0	0	0	Net Fixed capital form'n	0	0	0	0
Financial	0		0	0	0	0	Net acquistions fin'l assets	0	0	0	Net Lending of RoW
Rest of World, Current	Imports of G&S	0	Compensation Employees	Property Payments, taxes and subsidies	Current transfers to RoW	0		0	0	0	0
Rest of World, Capital	0	0	0	0	0	0	Capital transfers	0	0	Current External balance	0
Account Totals	Commodity Supply	Cost of Production	Expenditure on Factors	Institutional Expenditure	Institutional Expenditure	Consumption Expenditure	Investment Expenditure	GFCF			

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National Accounts Matrix

Factor accounts

Institution accounts

	Generation of Income	Allocation Primary Income	Secondary Dist'n of Income	Use Disposable Income
Commodities	0	0	0	Consumption Expenditure
Activities	0	0	0	0
Generation of Income	0	0	0	0
Allocation Primary Income	Net Generated Income (BP)	Property Inomce	0	0
Secondary Dist'n of Income	0	Net National Income	Current transfers	0
Use Disposable Income	0	0	Disposable net Income	0
Capital	0	0	0	Net Savings

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Macro-SAM vv NAM

- Macro-SAM
  - Simple link to micro-SAM
- National Accounts Matrix
  - Simple link to summary national accounts

Can (should?) contain the same information

Choice is pragmatic

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Complete and Consistent

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INcomplete AND INconsistent

Where all compilers start

INcomplete:
all transactions are NOT recorded

How can we know?

INconsistent:
every expenditure does NOT have a matching and equal income

Row and column totals differ

Action: render the prior SAM 'complete'

All too often compilers do not render prior SAM complete and simply force SAM consistency

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INcomplete AND Consistent

Consistent:
every expenditure has a matching and equal income

Reconciled Balanced

INcomplete:
all transactions are NOT recorded

How can we know?

Outcome: some TVs in the SAM are biased

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Complete AND INconsistent

Complete:
all transactions recorded

How can we know?

INconsistent:
every expenditure does NOT have a matching and equal income

Row and column totals differ

Action: use mathematical estimation technique

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Complete AND Consistent

Complete:
all transactions recorded

How can we know?

Consistent:
every expenditure has a matching and equal income

Reconciled Balanced

A gold standard, BUT ….

‘Unknown Unknowns’

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The SNA Production Boundary

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SNA Production Boundary

"All goods and services produced as outputs must be such that they can be sold on markets or at least be capable of being provided by one unit to another, with or without charge. The SNA includes within the production boundary all production actually destined for the market, whether for sale or barter. It also includes all goods or services provided free to individual households or collectively to the community by government units or NPISHs."
(SNA, 2008, para 1.40)

A requirement that it must be possible to associate an 'unambiguous' price to the output of activities if they are to be included within the SNA production boundary

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General Production Boundary

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General Production Boundary

- Included in the General Production Boundary
  - SNA boundary activities
    - Market production
    - HPHC
    - Purchased domestic services
  - Other non-market productive activities
    - Parental childcare
    - Cooking
    - Care for the elderly
- Excluded: leisure

Domestic services etc., delivered by employed persons are within the SNA boundary

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Price System in a SAM

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Price System in a SAM

- Purchaser Prices
  - prices paid by purchasers, which include transport and distribution margins and any VAT payable.
- Producer Prices
  - Prices paid to the producer by the purchaser less any VAT or other deductible tax and any transport or distribution charges invoiced separately.
- Basic Prices
  - prices paid to the producer by the purchaser less any tax payable plus any subsidy receivable but excluding any transport or distribution charges invoiced separately.

The system of prices in the System of National Accounts

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Price System in a SAM

Basic prices
+
Taxes on products excluding invoiced VAT
-
Subsidies on products
=
Producers' prices
+
VAT not deductible by the purchaser
+
Separately invoiced transport charges
+
Wholesalers' and retailers' margins
=
Purchasers' prices

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Defining Purchaser Prices

Using the information in Table 3.1

$$VM^{bp}_{w,c} = SAM_{w,c} + \sum_{tm} SAM_{tm,w,c}$$

$$VC^{bp}_{c} = \sum_{a} SAM_{a,c} + \sum_{w} VM^{bp}_{w,c}$$

$$= \sum_{a} SAM_{a,c} + \sum_{w} SAM_{w,c} + \sum_{tm,w} SAM_{tm,w,c}$$

$$VC^{pp}_{c} = \sum_{a} SAM_{a,c} + \sum_{w} SAM_{w,c} + \sum_{tm,w} SAM_{tm,w,c} + \sum_{m} SAM_{m,c} + \sum_{ts} SAM_{ts,c}$$

$$= \left(VC^{bp}_{c}\right) + \left(\sum_{m} SAM_{m,c} + \sum_{ts} SAM_{ts,c} \right)$$

Price systems are embedded in the accounting data

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Basic Prices

- Role of Basic Prices in the SNA
  - Benchmark prices
  - Other prices are defined relative to basic prices
    - Adding taxes and margins
    - Subtracting subsidies

Can LOOP hold with multiple prices in a column?

Implicit assumption of separability

Price systems are embedded in the accounting data

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Examples of Price Definitions

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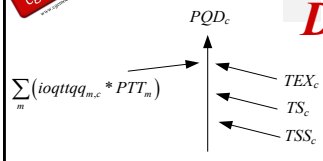
Domestic Margins



$$QTT_{'mtrad'} = \sum_c \frac{SAM_{c,'mtrad'}}{PQD_c}$$

$$PTT_{'mtrad'} = \sum_c \left[\left(SAM_{c,'mtrad'} / PQD_c / QTT_{'mtrad'} \right) * PQD_c \right]$$

$$ioqttqq_{'cveh','mtrad'} = \frac{\left(SAM_{'mtrad',c} \Big/ \left\{ \left[SAM_{c,'total'} - SAM_{c,'row'} - SAM_{'vattax',c} \right] / QQ_c \right\} \right)}{QQT_{'mtrad'}}$$

$$PQD_c = \left\{ \left[SAM_{c,'total'} - SAM_{c,'row'} - SAM_{'vattax',c} \right] / QQ_c \right\}$$

Behavioural assumption – io coefficient

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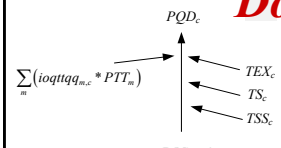
Domestic Demand: Price



$$(PQD_{'cveh'} * QQ_{'cveh'}) = (PQS_{'cveh'} * QQ_{'cveh'}) + \sum_m (ioqttqq_{'cveh',m} * PTT_m * QQ_c)$$

Behavioural assumption – *ad valorem*

$$+ (TS_{'cveh'} * PQS_{'cveh'} * QQ_{'cveh'})$$
$$+ (TSS_{'cveh'} * PQS_{'cveh'} * QQ_{'cveh'})$$

Behavioural assumption – *specific*

$$+ (TEX_{'cveh'} * QQ_{'cveh'})$$

$$PQD_{'cagric'} = \left[PQS_{'cagric'} + (TS_{'cagric'} * PQS_{'cagric'}) + (TSS_{'cveh'} * PQS_{'cveh'}) \right] + (TEX_{'cveh'}) + \sum_m ioqttqq_{'cveh',m} * PTT_m$$

$$PQD_{'cagric'} = PQS_{'cagric'} * (1 + TS_{'cagric'} + TSS_{'cveh'}) + tex_{'cveh'} + \sum_m ioqttqq_{'cveh',m} * PTT_m$$

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Value Added Tax

- VAT
  - Tax on commodities in final demand
    - NOT a tax on value added
  - 'Rebated' on
    - Intermediate inputs
    - Investment
  - Not charged
    - Government
- Excise tax – specific per unit tax
- Saltax encompasses
  - GST
  - Other indirect taxes
  - ……
- Saltax NOT a 'clean' tax instrument

Decision: levy VAT - *ad valorem* over and above 'other' commodity taxes

An approximation

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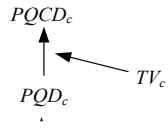
Value Added Tax



$$(PQCD_{cveh'} * QCD_{cveh',h}) = \left(\left[PQS_{cveh'} * \left(1 + TS_{cagric'} + TSS_{cveh'}\right) + TEX_{cveh'} + \sum_m ioqttqq_{cveh',m} * PTT_m \right] * QCD_{cveh',h} \right) + \left(TV_{cveh'} * \left[PQS_{cveh'} * \left(1 + TS_{cagric'} + TSS_{cveh'}\right) + TEX_{cveh'} + \sum_m ioqttqq_{cveh',m} * PTT_m \right] * QCD_{cveh',h} \right)$$

$$PQCD_{cveh'} = \left(PQD_{cveh'} * QCD_{cveh',h}\right) + \left(TV_{cveh'} * PQD_{cveh'} * QCD_{cveh',h}\right)$$

$$= PQD_{cveh'} + \left(TV_{cveh'} * PQD_{cveh'}\right)$$

$$PQCD_{cveh'} = PQD_{cveh'} + \left(1 + TV_{cveh'}\right)$$

Behavioural assumption – *ad valorem*

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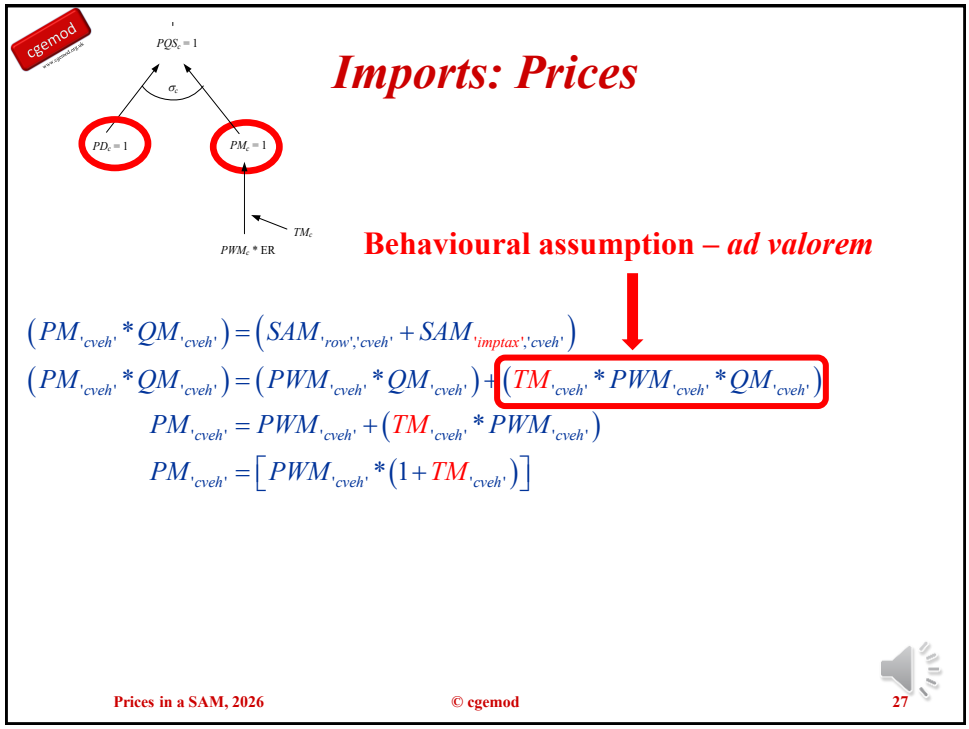
cgemod
$PQS_c = 1$
σ_c
$PD_c = 1$
$PM_c = 1$
TM_c
PWM_c * ER
Imports: Prices
Behavioural assumption – ad valorem
$(PM_{'cveh'} * QM_{'cveh'}) = (SAM_{'row','cveh'} + SAM_{'imptax','cveh'})$
$(PM_{'cveh'} * QM_{'cveh'}) = (PWM_{'cveh'} * QM_{'cveh'}) + (TM_{'cveh'} * PWM_{'cveh'} * QM_{'cveh'})$
$PM_{'cveh'} = PWM_{'cveh'} + (TM_{'cveh'} * PWM_{'cveh'})$
$PM_{'cveh'} = [PWM_{'cveh'} * (1 + TM_{'cveh'})]$
Prices in a SAM, 2026
© cgemod
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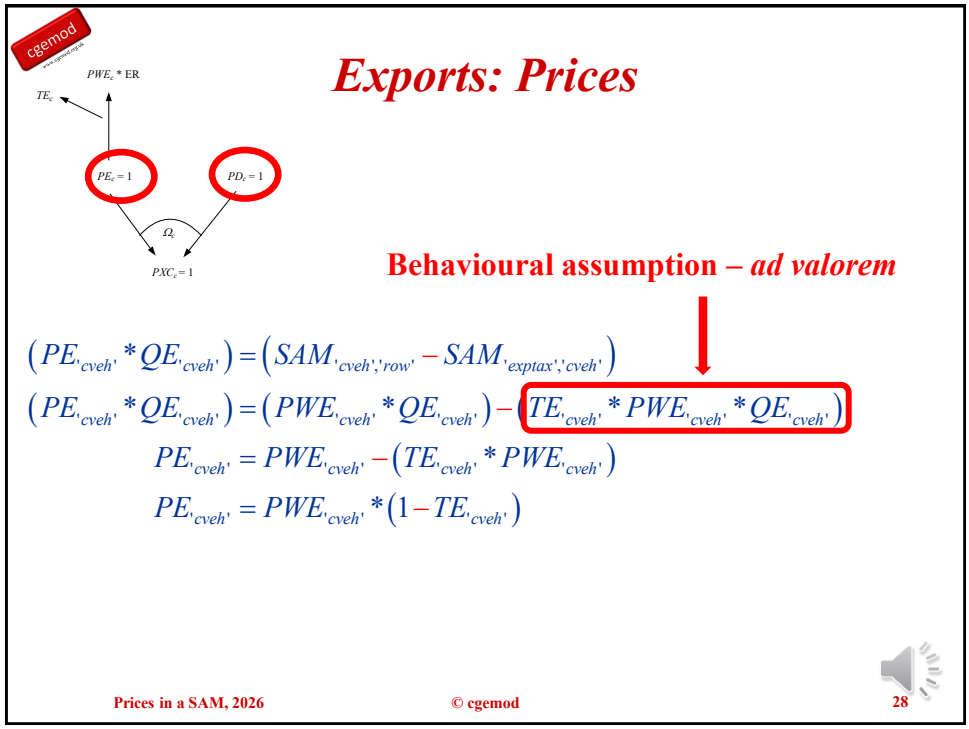
cgemod
PWE_c * ER
TE_c
$PE_c = 1$
$PD_c = 1$
Ω_c
$PXC_c = 1$
Exports: Prices
Behavioural assumption – ad valorem
$(PE_{'cveh'} * QE_{'cveh'}) = (SAM_{'cveh','row'} - SAM_{'exptax','cveh'})$
$(PE_{'cveh'} * QE_{'cveh'}) = (PWE_{'cveh'} * QE_{'cveh'}) - (TE_{'cveh'} * PWE_{'cveh'} * QE_{'cveh'})$
$PE_{'cveh'} = PWE_{'cveh'} - (TE_{'cveh'} * PWE_{'cveh'})$
$PE_{'cveh'} = PWE_{'cveh'} * (1 - TE_{'cveh'})$
Prices in a SAM, 2026
© cgemod
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Output: Prices

$$PX_a * (1 - TX_a) * QX_a = [PVA_a * QVA_a] + [PINT_a * QINT_a]$$

Behavioural assumption
– *ad valorem*

$$PX_a * QX_a = \sum_{sac} SAM_{sac,a} = VX_a$$

$$QX_a = \sum_{sac} SAM_{sac,a} \Big/ PX_a = VX_a$$

$$PX_a * (1 - TX_a) * QX_a = [PX_a * QX_a] - [TX_a * PX_a * QX_a]$$

$$TX_a = \frac{VTX_a}{VX_a} = \frac{TX_a * PX_a * QX_a}{PX_a * QX_a}$$

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Theory of Social Accounting Part 2

The End

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