MSc in Economics for Development

Macroeconomics for Development

Week 1 Class

Sam Wills

Department of Economics, University of Oxford

samuel.wills@economics.ox.ac.uk

Consultation hours: Friday, 2-3pm, Weeks 1,3-8 (MT)

11 October 2011

References

- Pierre-Richard Agénor (2004) *The Economics of Adjustment and Growth, Chapter 1.*

Overview

1. The aim of Class 1 is to refresh our understanding of national accounts
2. National accounts are important as they are the language macroeconomists use to describe the economic world
3. To understand national accounts we need two key concepts:
   a. Stocks and Flows
   b. Sources and Uses
4. To understand national accounts it may also help to think of the economy graphically...
5. ...Then map this to the "consistency accounting matrix" (CAM)
6. The CAM records two types of transactions:
   a. Current Account Transactions
   b. Capital Account Transactions
7. This can be illustrated using Ugandan data

1. The aim of Class 1 is to understand the national accounts

Example consistency accounting matrix

Current Account | **Capital Account**

	Sources (rows) and Uses (columns)	A National Accounts	B Government	C Financial System	D Nonfinancial Private Sector	E External Sector	F Government	G Financial System	H Nonfinancial Private Sector	I External Sector	J Total Investment	Total
1	National Accounts		C^g		C^p	X	I^g		I^p		$I = I^p + I^g$	$Y = C^g + C^p + X - J + I$
2	Government	$T_I - SUB + OS^g$			T_D	NT^{gf}						$T^g = T_I - SUB + OS^g + T_D + NT^{gf}$
3	Financial System											
4	Nonfinancial Private Sector	$W + \Pi + Y_s$	$NT^{pg} + INT^{pg}$			$NT^{pf} + NFP^{pf}$						$Y^p = W + \Pi + Y_s + NT^{pg} + INT^{pg} + NT^{pf} + NFP^{pf}$
5	External sector	J	INT^{fg}		INT^{fp}							$J + INT^{fg} + INT^{fp}$

Savings and Borrowings

6	Government		S^g					ΔL^{gb}	ΔB^p	ΔFB^g		$S^g + \Delta L^{gb} + \Delta B^p + \Delta FB^g$
7	Financial system								ΔM			ΔM
8	Nonfinancial Private sector				S^p			ΔL^{pb}		ΔFB^p		$S^p + \Delta L^{pb} + \Delta FB^p$
9	External sector					CA		ΔR^*				$CA + \Delta R^*$
10	Total Savings (Sum of previous 4 rows)		S^g		S^p	CA						$S^g + S^p + CA = I$
	Total	$Y + J = TI - SUB + OS^g + (W + \Pi + Y_s) + J$	$G + S^g = T^g$		$CC^p + S^p = Y^p$	$X + NT^{gf} + NT^{pf} + NFP^{pf} = CA$	I^g	$\Delta L + \Delta R^*$	$I^p + \Delta B^p + \Delta M$	$\Delta FB^g + \Delta FB^p$	$I = I^p + I^g$	

Notes: G in column B is defined as $G = C^g + NT^{pg} + (INT^{pg} + INT^{fg})$. CC^p in column D is defined as $CC^p = C^p + T_D + INT^{fp}$. ΔL in column G is defined as $\Delta L = \Delta L^{gb} + \Delta L^{pb}$.

Source: Agenor, Table 1.1

2. National accounts are important as they are the language macroeconomists use to describe the economic world

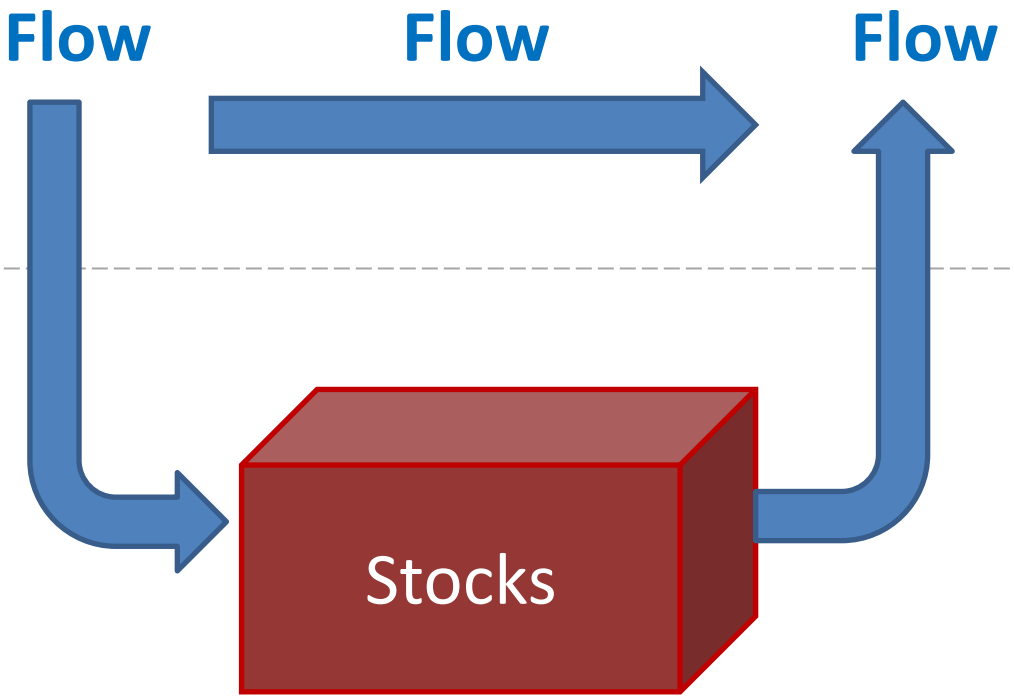
"Whose fault is the replacement of serious discussion of world trade by what I have come to think of as "pop internationalism?...

...One should not ignore the role of editors, who often prefer what pop internationalists have to say to the disturbingly difficult ideas of people who know how to read national accounts or understand that the trade balance is also the difference between savings and investment."

- Paul Krugman, Pop Internationalism, 1996

3. To understand national accounts we need two key concepts.

a. Stocks and Flows



Example Flows
- Revenue
- Expenditure

Example Stocks
- Assets
- Liabilities

3. To understand national accounts we need two key concepts.
b. Sources and uses

Flows

- National accounts record how funds flow around the economy
- Every flow must have both:
  - A source: where it comes from
  - A use: where it goes to
- Therefore we deal only with identities and budget constraints to track where these flows move
  - Hence we only use addition and subtraction.
- This is the same idea as the “debits and credits” used for corporate accounting

Stocks

- National accounts also record stocks.
- These are found in national balance sheets
  - These are ‘off stage’ in our analysis today
- They can be constructed from flow accounts
- They are also of increasing relevance when considering stocks of natural resources
  - See work by the UN’s Systems of National Accounts division

3b. Double entry accounting is a method of keeping track of these sources and uses.

Example consistency accounting matrix

Uses of Gov't funds in Current Account

Uses of Gov't funds in Capital Account

Sources of Gov't funds in Current Account

Sources of Gov't funds in Capital Account

Current Account

	Sources (rows) and Uses (columns)	A National Accounts	B Government	C Financial System	D Nonfinancial Private Sector	E External Sector
1	National Accounts		C^g		C^p	X
2	Government	$T_I - SUB + OS^g$			T_D	NT^{gf}
3	Financial System					
4	Nonfinancial Private Sector	$W + \Pi + Y_s$	$NT^{pg} + INT^{pg}$			$NT^{pf} + NFP^{pf}$
5	External sector	J	INT^{fg}		INT^{fp}	
	Savings and Borrowings					
6	Government		S^g			
7	Financial system					
8	Nonfinancial Private sector				S^p	
9	External sector					CA
10	Total Savings (Sum of previous 4 rows)		S^g		S^p	CA
	Total	$Y + J = TI - SUB + OS^g + (W + \Pi + Y_s) + J$	$G + S^g = T^g$		$CC^p + S^p = Y^p$	$X + NT^{gf} + NT^{pf} + NFP^{pf} \equiv CA$

Capital Account

	F Government	G Financial System	H Nonfinancial Private Sector	I External Sector	J Total Investment	Total
1	I^g		I^p		$I = I^p + I^g$	$Y = C^g + C^p + X - J + I$
2						$T^g = T_I - SUB + OS^g + T_D + NT^{gf}$
3						
4						$Y^p = W + \Pi + Y_s + NT^{pg} + INT^{pg} + NT^{pf} + NFP^{pf}$
5						$J + INT^{fg} + INT^{fp}$
6		ΔL^{gb}	ΔB^p	ΔFB^g		$S^g + \Delta L^{gb} + \Delta B^p + \Delta FB^g$
7			ΔM			ΔM
8		ΔL^{pb}		ΔFB^p		$S^p + \Delta L^{pb} + \Delta FB^p$
9		ΔR^*				$CA + \Delta R^*$
10						$S^g + S^p + CA = I$
	I^g	$\Delta L + \Delta R^*$	$I^p + \Delta B^p + \Delta M$	$\Delta FB^g + \Delta FB^p$	$I = I^p + I^g$	

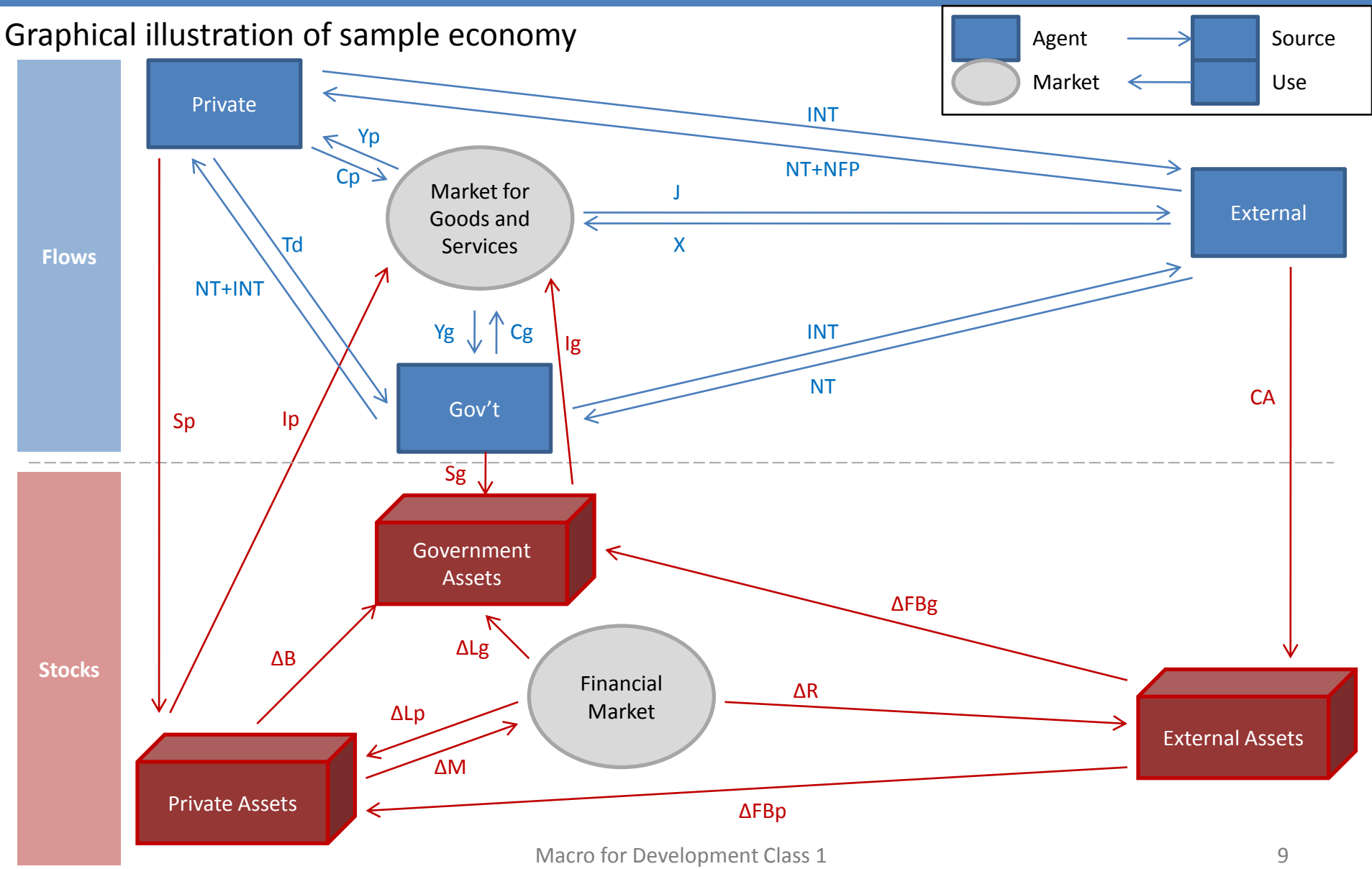
Notes: G in column B is defined as $G = C^g + NT^{pg} + (INT^{pg} + INT^{fg})$. CC^p in column D is defined as $CC^p = C^p + T_D + INT^{fp}$. ΔL in column G is defined as $\Delta L = \Delta L^{gb} + \Delta L^{pb}$.

Sectors appear twice: once for their "flow" transactions (current account) and once for their "stock" transactions (capital account)

Source: Agenor, Table 1.1

4. To understand national accounts it may also help to think of the economy graphically...

Graphical illustration of sample economy



5...Then map this to the "consistency accounting matrix" (CAM)

Example consistency accounting matrix

Current Account

	Sources (rows) and Uses (columns)	A National Accounts	B Government	C Financial System	D Nonfinancial Private Sector	E External Sector
1	National Accounts		C^g		C^p	X
2	Government					NT^{gf}
3	Financial System					
4	Nonfinancial Private Sector					$NT^{pf} + NFP^{pf}$
5	External sector	J			INT^{fp}	

Capital Account

	F Government	G Financial System	H Nonfinancial Private Sector	I External Sector	J Total Investment	Total
1	I^g		I^p		$I = I^p + I^g$	$Y = C^g + C^p + X - J + I$
2						$T_I - SUB + OS^g + NT^{gf}$
3						
4						$+ Y_s + NT^{pg} + NT^{pf} + NFP^{pf}$
5						$J + INT^{fg} + INT^{fp}$

Savings and Borrowings

6	Government		S^g			
7	Financial system					
8	Nonfinancial Private sector					
9	External sector					CA
10	Total Savings (Sum of previous 4 rows)				S^p	CA
	Total	$Y + J = TI - SUB + OS^g + (W + \Pi + Y_s) + J$	$G + S^g = T^g$		$CC^p + S^p = Y^p$	$X + NT^{gf} + NT^{pf} + NFP^{pf} = CA$

6		ΔL^{gb}	ΔB^p	ΔFB^g		$S^g + \Delta L^{gb} + \Delta B^p + \Delta FB^g$
7						ΔM
8		ΔL				$+ \Delta FB^p$
9		ΔR				ΔR^*
10						$S^g + S^p + CA = I$
	I^g	$\Delta L + \Delta R^*$	$I^p + \Delta B^p + \Delta M$	$\Delta FB^g + \Delta FB^p$	$I = I^p + I^g$	

Flows from current period to current period

Flows from stocks to current period

Flows from current period to stocks

Flows from stocks to stocks

Notes: G in column B is defined as $G = C^g + NT^{pg} + (INT^{pg} + INT^{fg})$. CC^p in column D is defined as $CC^p = C^p + T_D + INT^{fp}$. ΔL in column G is defined as $\Delta L = \Delta L^{gb} + \Delta L^{pb}$.

Source: Agenor, Table 1.1

6. The CAM records two types of transactions: Current Account and Capital Account

Balance of Payments

- Accounting record of all transactions between country and rest of the world
- Must balance to zero when all transactions are included
    - eg deficits in the Current Account must be funded by surpluses in the Capital Account

Current Account

- Amount country is earning if in surplus or spending if in deficit.
- On diagram: CA is the amount being pumped into/out of the economy in each period.
- Accounting identity, amount going across the dotted line must add up and balance out.
- Net exports (trade balance), factor payments + interest (earned on assets in capital account), and transfers (E5)

Capital Account

- How current account deficits are financed/surpluses are used
- Describes flows to/from the capital stock of each agent
- Equal and opposite to current account
    - Sometimes the Capital Account is split into Central Bank and Private/Govt transactions
    - The IMF splits it into the Capital Account (capital transfers and acquisition/disposal of non-produced, non-financial assets) and the Financial Account (everything else)

6a. Current Account Transactions
R1CA: National Accounts

Identity

$$C_p + C_g + I + X = Y + J$$

$$C_p + C_g + I + X = (T\text{-}SUB) + (W+\Pi+Ys) + J$$

Sources

C_p	Consumption: Private
C_g	Consumption: Gov't
I	Investment (Ip+Ig)
X	Exports

Uses

T-SUB	Government Income
W+Π+Ys	Private Income
J	Imports (External Income)

Intuition

- The national accounts describe the market for goods and services in the current period. It is an identity rather than a budget constraint.
- This market generates the income in each period that pumps around the economy
- The identity allows us to estimate GDP (Y) in two ways:
  - Expenditure Approach: Y = C + I + G + X – J where C+I=Absorption
  - Income Approach: Y = (T-SUB) + (W+Π+Ys) + J

6a. Current Account Transactions
R2CB: Government Accounts

Budget Constraint

$$T_g = G + S_g$$

$$(T\text{-}SUB) + Td + NT_{gf} = C_g + (NT_{pg} + INT_{pg}) + INT_{fg} + S_g$$

Sources

T-SUB	Gov't Income (indirect)
Td	Gov't Income (direct from private)
NT_{gf}	Gov't Income (direct from external)

Uses

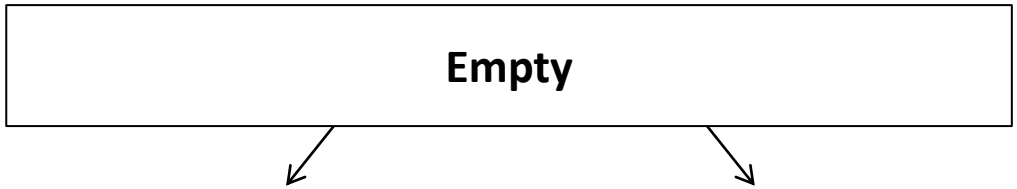
C_g	Gov't Consumption
NT_{pg}+ INT_{pg}	Transfers + interest on gov't bonds to private
INT_{fg}	Interest on gov't bonds to external
S_g	Gov't Savings

Intuition

• This is a budget constraint as the income earned by the government in the period must be used in consumption, savings or payments to other sectors.

6a. Current Account Transactions
R3CC: Financial System Accounts

Identity



Sources	Uses
NA	**NA**

Intuition

- In this example the financial system is just a market: no independent revenue or expenditure.
- Value added is included as income in the production accounts (column A).

6a. Current Account Transactions
R4CD: Private Sector Accounts

Budget Constraint

$$Y_p + (NT_{pg} + INT_{pg}) + (NT_{pf} + NFP_{pf}) = C_p + T + INT_{fp} + S_p$$

Sources		Uses	
Y_p	Private Income	C_p	Private Consumption
$NT_{pg} + INT_{pg}$	Transfer and Interest from Govt	T	Taxes
		INT_{fp}	Interest repayments on foreign debt
$NT_{pf} + NFP_{pf}$	Transfers and factor payments from external	S_p	Private Savings

Intuition

- The sources of income come from agents in the current period
- The uses of income are either in the current period ($C_p + T + INT_{fp}$) or in future periods S_p.
- As savings changes the amount of private assets, it goes into the capital account

6a. Current Account Transactions
R5CE: External Sector Accounts

Budget Constraint

$$J + INT_{fg} + INT_{fp} = X + NT_{gf} + (NT_{pf} + NFP_{pf}) + CA$$

Sources		Uses	
J	Income from imports	**X**	Exports
INT_{fg}	Interest repayments on foreign debt from government	**NT_{gf}**	Net transfers to Govt
INT_{fp}	Interest repayments on foreign debt from private	**$NT_{pf} + NFP_{pf}$**	Net transfers to private and factor payments
		CA	Current Account

Intuition

- By construction, all transactions with the external sector due to the Current Account entry
- The Current Account describes funds being pumped into (CA surplus/-ive external savings) or out of (CA deficit/+ive external savings) the domestic economy's system per period.
- Think of these transactions as the "causes" of a CA deficit/surplus.

6b. Capital Account Transactions
R6CF: Government Accounts

Budget Constraint

$$S_g + \Delta L_g + \Delta B + \Delta FB_g = I_g$$

Sources

S_g	Government savings
ΔL_g	Net borrowing from financial sector
ΔB	Net borrowing from private sector
ΔFB_g	Net borrowing from external sector

Uses

I_g	Government investment

Intuition

- Savings provides the link between government in the current account and the capital account.
- Consider savings as a budget surplus in the current account. If savings is negative, the above constraint describes how the deficit is financed.

6b. Capital Account Transactions
R7CG: Financial System Accounts

Identity

$$\Delta M = \Delta Lg + \Delta Lp + \Delta R$$

Sources		Uses	
ΔM	Money balances	**ΔLg**	Loans to the Government Sector
		ΔLp	Loans to the Private Sector
		ΔR	Net Foreign Exchange Reserves

Intuition

- The financial system is a market in this example, so this is an identity rather than a budget constraint.
- The identity says that its assets (claims on loans and ownership of foreign currency) must equal liabilities (domestic money).

6b. Capital Account Transactions
R8CH: Private Sector Accounts

Budget Constraint

$$S_p + \Delta L_p + \Delta FB_p = I_p + \Delta B_p + \Delta M$$

Sources		Uses	
Sp	Private Savings	**Ip**	Private Investment
ΔLp	Loans to the Private Sector	**ΔB_p**	Gov't bond holdings
ΔFBp	Foreign borrowings by Private Sector	**ΔM**	Money balances

Intuition

- Private savings again provides the link between the current and capital accounts
- Substituting out savings shows that current income, plus borrowing, less current expenditure equates to private asset acquisition.

6b. Capital Account Transactions
R9CI: External Sector Accounts

Budget Constraint

$$CA + \Delta R = \Delta FB_p + \Delta FB_g$$

Sources		Uses	
CA	Current account deficits (savings by foreign sector)	**ΔFB_p**	Change in private foreign borrowing
ΔR	Increases in foreign reserves held by financial sector	**ΔFB_g**	Change in gov't foreign borrowing

Intuition

- This budget constraint helps describe how a current account deficit must be financed by:
  - Increase in net foreign borrowing (ie more liabilities/debt)
  - Decrease in foreign reserves held by financial sector (ie fewer assets)

6b. Capital Account Transactions
R10CJ: Total Savings/Investment Accounts

Budget Constraint

$$S_p + S_g + CA = I_s + I_g$$

Sources

S_p	Savings by Private Sector
S_g	Savings by Gov't Sector
CA	Current account deficits (savings by foreign sector)

Uses

I_p	Investment by Private Sector
I_g	Investment by Gov't Sector

Intuition

- This constraint can be found by adding up all the constraints in row 10 and column J
- It can thus be thought of as a macroeconomic budget constraint

7. This can be illustrated using Ugandan data

Ugandan Data Example, 2002

Excercises

•Use the data to reproduce the consistency framework for Uganda.

•Use this to write down the principal budget constraints/identities as they apply to the different agents and use them to define the following concepts:

- *GDP at factor cost vs GDP at market prices*
- *Absorption*
- *Value Added*
- *Government savings vs primary fiscal balance vs overall balance*
- *Net resource transfer vs Net resource flow*
- *Net foreign asset acquisition (as the measure of net wealth)*

7. This can be illustrated using Ugandan data

Ugandan Data Example, 2002

Exchange Rate: 1US$ = 2000 Uganda Shillings

	Ush bn	US$ mn
Wages	5040	
Profits	3220	
Self-employment income (i.e. smallholders)	2350	
Private consumption	10175	
Exports		765
Remittances (= net factor payments to labour)		495
Imports		1700
Interest on public foreign debt		25
Interest on private foreign debt		25
Government consumption	1780	
Government Investment	690	
Private Investment	910	
Import duties		235
Domestic Indirect taxes	605	
Direct Taxes	365	
Grants		375
Interest on domestic debt	75	
Net domestic credit to government	95	
Net domestic credit to private sector	100	
Net domestic public borrowing	70	
Net foreign public borrowing		120
Net foreign private borrowing		55
Change in official reserves		60
Change in money suppy	315	