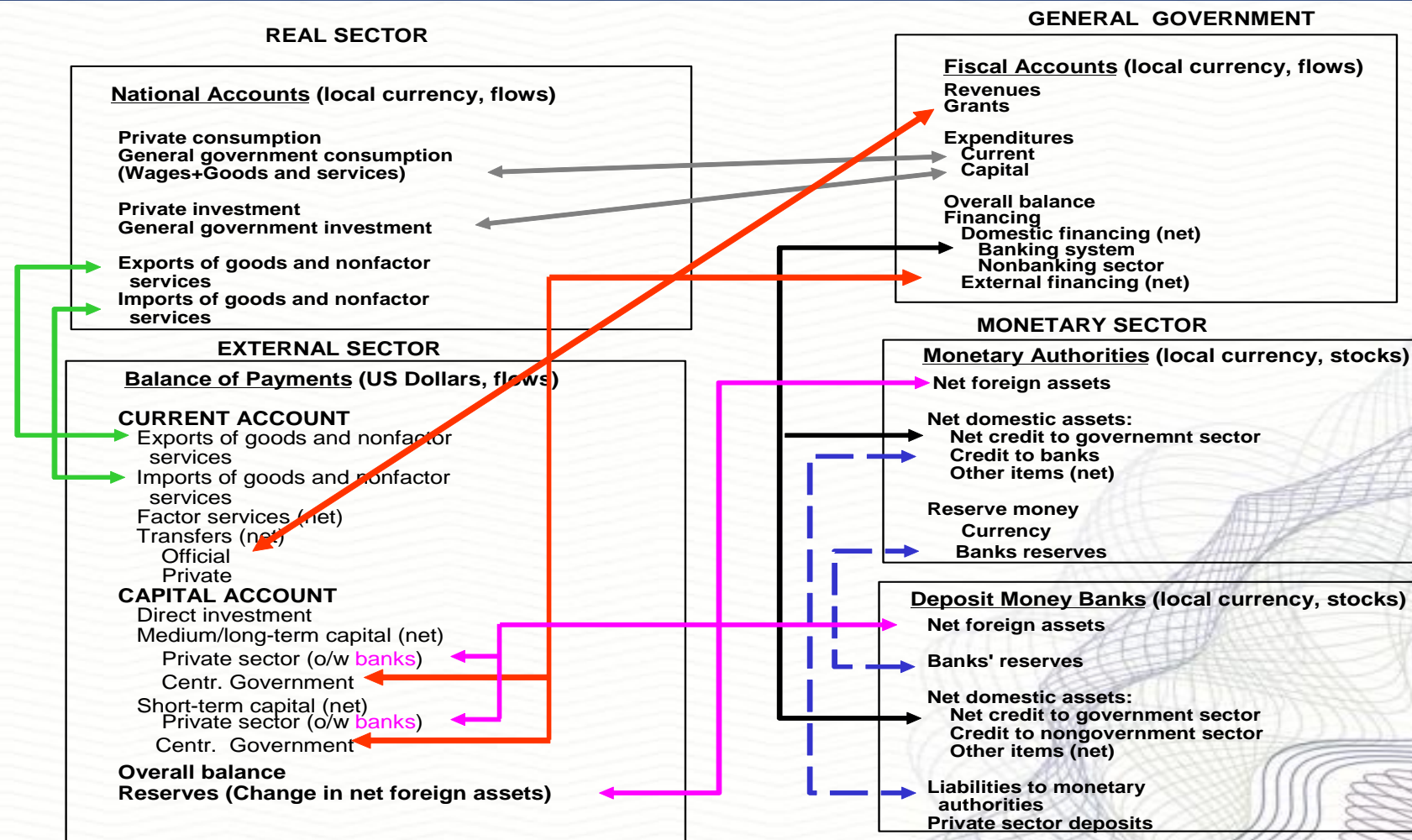# Macroeconomic Account Interrelation

Jakarta, 23 August 2017

I. Accounting Links

Accounts and Analysis

❑ Real Sector accounts

❑ External Sector accounts

❑ Fiscal accounts

❑ Monetary accounts

❑ Interrelationships among the accounts

National Accounts

Real Transactions

$$GDP = C + I + \underbrace{X - M}_{g + s}$$

$$GNDI = C + I + \underbrace{X - M + Y_f + TR_f}_{CAB}$$

$$GNDI_p + GNDI_g = C_p + C_g + I_p + I_g + CAB$$

$$GNDI_p - C_p - I_p + GNDI_g - C_g - I_g = CAB$$

$$\underbrace{S_p - I_p}_{} + \underbrace{S_g - I_g}_{} = CAB = S_f$$

or $S - I = CAB = S_f$

Balance of Payments

## Current Account	CAB
Real Transactions	
Goods	X - M
Services	
Income	Y_f
Transfers	TR_f
## Capital and Financial Account	K
Financial Transactions	
Direct Investment	FDI
Short, Medium and Long Term Capital	
Government	NFBg
Private	NFBp
Other Net Foreign Assets of Banking System	
Errors and Omissions	OIN_f
## Overall Result	CAB + K
Net International Reserves	ΔNIR

NFB

ΔNFA

Fiscal Account

REVENUE — Revenue

    Tax — - interest

    Non tax — <u>- transfers (net)</u>

        = GNDIg

EXPENDITURE

    Current — S_g

        Wages — $-C_g$

        Goods

        Interest

        Transfers

    Capital — I_g

FISCAL BALANCE = Rev – Exp = $S_g - I_g$

Financial Transactions

FINANCING = $- (S_g - I_g)$

    External Financing — NFB_g

    Internal Financing

        Banking — ΔNDC_g

        Non-bank — NB

        Other — OIN_g

Private Sector Accounts

<div style="text-align:center">**Real Transactions**</div>

Disposable income	GNDIp
Expenditure	
Consumption	Cp
Investment	Ip
Saving	Sp = GNDI - Cp
Sectoral balance	Sp - Ip

<div style="text-align:center">**Financial Transactions**</div>

External financing	
Foreign direct investment	FDI
Net foreign borrowing	NFBp
Domestic borrowing (net)	
Net bank credit	ΔNDCp
Less: Asset holdings	ΔM2
Less: Government bonds	NB
Errors and Omissions	OINp

Monetary Accounts

Financial Transactions

Net Foreign Assets	NFA
Central bank	NIR
Commercial banks	NFA_B
Net Domestic Assets	NDA
Domestic credit	NDC
Public sector (net)	NDC_g
Private sector	NDC_p
Other items, net	OIN_B
Liabilities to Private Sector	M2
Currency in circulation	C
Deposits	D

where   NFA + NDA = M2

Linkages

Balance of payments

$$CAB = X - M + Yf + TRf$$

$$CAB = \Delta NFA - FDI - NFB$$

$$\Delta NFA = CAB + FDI + NFB$$

Linkages

Balance of payments

$$\Delta NFA = CAB + FDI + NFB$$

National accounts

$$Y = C + I + CAB$$

Linkages

Balance of payments

$\Delta NFA = CAB + FDI + NFBg + NFBp$

National accounts

$Y = C + I + CAB$

Fiscal accounts

$E - R = NB + \Delta NDCg + NFBg$

Linkages

Balance of payments

$\Delta NFA = CAB + FDI + NFBg + NFBp$

National accounts

$Y = C + I + CAB$

Fiscal accounts

$E - R = NB + \Delta NDCg + NFBg$

Monetary accounts

$\Delta M2 = \Delta NDA + \Delta NFA$

$= \Delta NDCg + \Delta NDCp + OIN + \Delta NFA$

Linkages: Reserves

Balance of payments

ΔNFA = CAB + FDI + NFBg + NFBp

National accounts

Y = C + I + CAB

Fiscal accounts

E − R = NB + ΔNDCg + NFBg

Monetary accounts

ΔM2 = ΔNDCg + ΔNDCp + OIN + ΔNFA

Linkages: Current Account

Balance of payments

$\Delta NFA = CAB + FDI + NFBg + NFBp$

National accounts

$Y = C + I + CAB$

Fiscal accounts

$E - R = NB + \Delta NDCg + NFBg$

Monetary accounts

$\Delta M2 = \Delta NDCg + \Delta NDCp + OIN + \Delta NFA$

Linkages: Foreign Borrowing (Govt.)

Balance of payments

ΔNFA = CAB + FDI + NFBg + NFBp

National accounts

Y = C + I + CAB

Fiscal accounts

E − R = NB + ΔNDCg + NFBg

Monetary accounts

ΔM2 = ΔNDCg + ΔNDCp + OIN + ΔNFA

Linkages: Credit to Government

Balance of payments

$\Delta NFA = CAB + FDI + NFBg + NFBp$
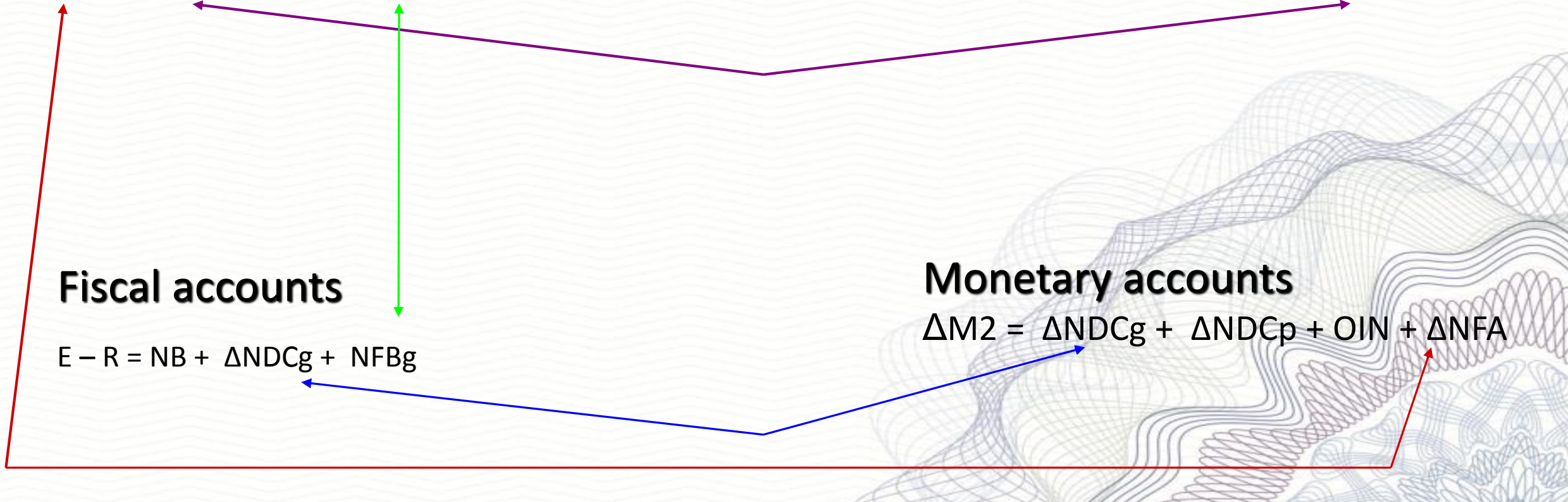
National accounts

$Y = C + I + CAB$

Fiscal accounts

$E - R = NB + \Delta NDCg + NFBg$

Monetary accounts

$\Delta M2 = \Delta NDCg + \Delta NDCp + OIN + \Delta NFA$

Linkages: Private Sector Accounts

Balance of payments

$\Delta NFA = CAB + FDI + NFBg + NFBp$

National accounts

$Y = C + I + CAB$

Private sector accounts

$Ip - Sp = \Delta NDCp - \Delta M2 - NB + NFBp + FDI$

Fiscal accounts

$E - R = NB + \Delta NDCg + NFBg$

Monetary accounts

$\Delta M2 = \Delta NDCg + \Delta NDCp + OIN + \Delta NFA$

Linkages: Credit to Private Sector Account

Balance of payments

$\Delta NFA = CAB + FDI + NFBg + NFBp$

National accounts

$Y = C + I + CAB$

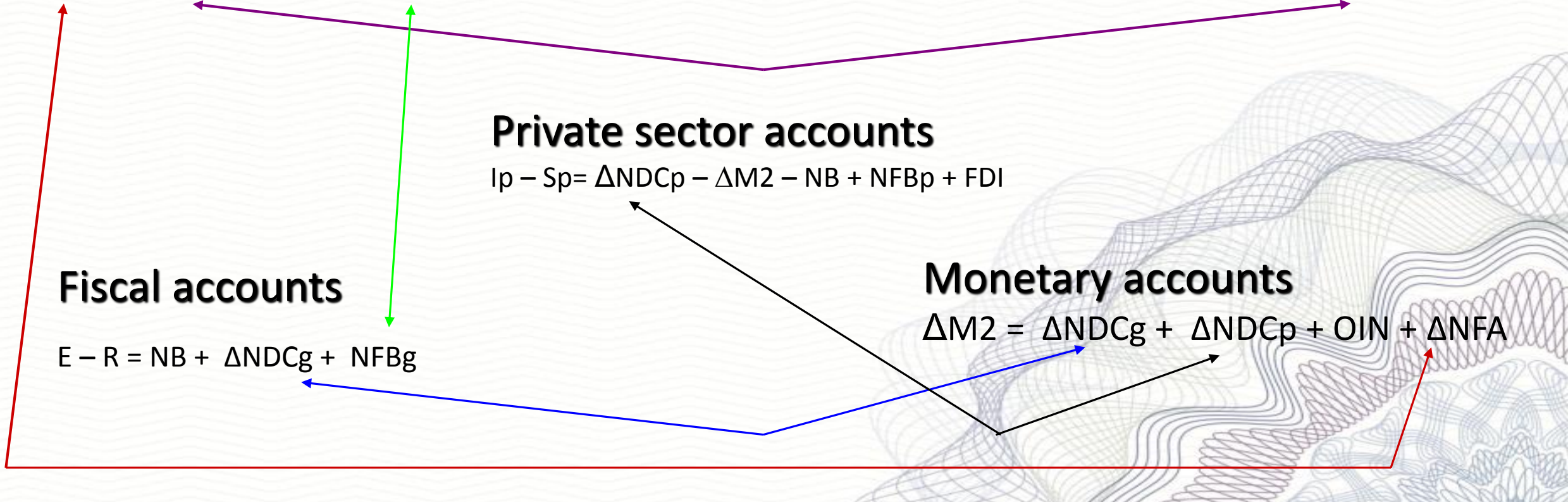**Private sector accounts**

$Ip - Sp = \Delta NDCp - \Delta M2 - NB + NFBp + FDI$

Fiscal accounts

$E - R = NB + \Delta NDCg + NFBg$

Monetary accounts

$\Delta M2 = \Delta NDCg + \Delta NDCp + OIN + \Delta NFA$

Linkages: Non-Bank Borrowing (NB)

Balance of payments

$\Delta NFA = CAB + FDI + NFBg + NFBp$

National accounts

$Y = C + I + CAB$

Private sector accounts

$Ip - Sp = \Delta NDCp - \Delta M2 - NB + NFBp + FDI$

Monetary accounts

$\Delta M2 = \Delta NDCg + \Delta NDCp + OIN + \Delta NFA$

Fiscal accounts

$E - R = NB + \Delta NDCg + NFBg$

Linkages: to BoP

Balance of payments

$\Delta NFA = CAB + FDI + NFBg + NFBp$

National accounts

$Y = C + I + CAB$

Private sector accounts

$Ip - Sp = \Delta NDCp - \Delta M2 - NB + NFBp + FDI$

Fiscal accounts

$E - R = NB + \Delta NDCg + NFBg$

Monetary accounts

$\Delta M2 = \Delta NDCg + \Delta NDCp + OIN + \Delta NFA$

Linkages: to Broad Money M2

Balance of payments

$\Delta NFA = CAB + FDI + NFBg + NFBp$

National accounts

$Y = C + I + CAB$

Private sector accounts

$Ip - Sp = \Delta NDCp - \Delta M2 - NB + NFBp + FDI$

Fiscal accounts

$E - R = NB + \Delta NDCg + NFBg$

Monetary accounts

$\Delta M2 = \Delta NDCg + \Delta NDCp + OIN + \Delta NFA$

Accounting links (1/3)

❑ "**Exports**" and "**Imports**" in real sector accounts = "**Export**s" and "**Imports**" in external sector accounts.

❑ C^G in real sector accounts = "**Current expenditure**" in fiscal sector accounts.

❑ I^G in real sector accounts = "**Capital expenditure**" in fiscal sector accounts.

❑ "**Official**" (not "private") part of TR^F (net transfer from abroad) in external sector accounts = "**Grants**" in fiscal sector accounts.

Accounting links (2/3)

❑ "**Government**" (not "private sector") part of "**Medium/long-term capital**" and "**Short-term capital**" in "Capital and financial account" in external sector accounts = "**External financing**" in fiscal sector accounts.

❑ "**Private sector**" part of "**Medium/long-term capital**" and "**Short-term capital**" in "Capital and financial account" in external sector accounts = "**Net foreign assets**" in DMBs' balance sheets in monetary sector accounts.

❑ "**Reserves**" (change in net foreign assets) in external sector accounts = "**Net foreign assets**" in MA part of monetary sector accounts.

Accounting links (3/3)

❑ "**Banking system**" part of "**Financing**" in fiscal account = "**Net credit to gov't sectors**" in MA and DMBs parts of monetary sector accounts.

❑ "**Credit to banks**" in MA's balance sheet in monetary sector accounts = "**Liabilities to monetary authorities**" in DMBs' balance sheets in monetary sector accounts.

❑ "**Bank reserves**" in MA's balance sheet in monetary sector accounts = "**Bank reserves**" in DMBs' balance sheets in monetary sector accounts

II. Flow of Funds Table

❑ Summarizes **interrelationships among the different sectors** systematically and coherently.

❑ Can be used to track relations among the different sectors.

❑ Issue: Not behavioral, so it needs to complement with additional analysis to forecast and identify causation.

❑ Consists of two parts.

  ▪ Part 1: **Non-financial transactions**. Part 1 records imbalance (deficit/surplus) in each sector.

  ▪ Part 2: **Financial transactions**. Part 2 records how part 1's imbalances are financed.

Schematic Flow of Funds Accounts

Transactions/ Sectors	(1)= (2)+(3) + (4)	Domestic Economy			Rest of the World (5)	Horizontal Check (1)+ (5)
		Government (2)	Private Sector (3)	Banking System (4)		
Gross National Disposable Income (GNDI)	+ GNDI	+ GNDI g	+ GNDI p			
Final Consumption	- C	- Cg	- Cp			
Gross Investment	-I	-Ig	-Ip			
Exports of goods and nonfactor serv.					- X	
Imports of goods and nonfactor serv.					M	
Net factor income					- Y$_f$	
Net Transfers					- TR$_f$	
Non Financial Balances	**(S-I)**	**(Sg-Ig)**	**(Sp-Ip)**	**0**	**- CAB**	**0**
Foreign Financing						
Nonmonetary Financing						
Direct Investment	FDI		FDI		-FDI	0
Net Foreign Borrowing	NFB	NFBg	NFBp		- NFB	0
Monetary Financing						
Change in Net Foreign Assets	-Δ NFA			-Δ NFA	+Δ NFA	0
Domestic Financing						
Monetary Financing						
Domestic Credit		+Δ NDCg	+Δ NDCp	-Δ NDC		0
Broad Money			-Δ M2	+Δ M2		0
Nonmonetary Financing						
Non Bank		NB	-NB			
Net Errors and Omissions	-Δ OINd	Δ OINg	Δ OINp	-Δ OINb	Δ OINf	0
Vertical Check	**0**	**0**	**0**	**0**	**0**	**0**

Part 1: Non-financial

- Part 1 is "Income" minus "Expenditure." Part 2 "finances" this income minus expenditure.
- **Income**: **GNDI** (either in government or private sector) and **M** (which is the production of ROW). GDNI of the private sector includes capital income, so banking system does not make any income.
- GNDI is either consumed (**C**) or invested (**I**), either in government or private sector.
- ROW's income, **M**, is spent to purchase this country's production (**X**) and transferred ($\mathbf{Y^f}$ and $\mathbf{TR^f}$).
- Suming up Part 1 provides non-financial balances: **S–I** (i.e., "savings-investment gap") and **–CAB**.

Part 2: Financial

- If Part 1 is (−), it should be financed by (+) (capital inflows).

- What are those inflows? (i) **FDI**. (ii) **NFB**. (iii) Banking system selling foreign assets, reflected as **−ΔNFA**.

- Note: NFB^P is obtained as $NFB - NFB^G$.

- Domestic financing: At country level, it sums up to zero. But it can finance sectoral(−)'s.

- Domestic financing includes an increase in domestic credit (**ΔNDC**), an increase in M2 (**ΔM2**), and non-bank financing (**NB**).

Indonesia: Flow of Funds, 2012

	Economy	Central Govt. Sector	Rest of Economy	Banking System	Rest of the World	Horizontal Check
Disposable Income	8,017,926.2	334,700.2	7,683,226.0			0.0
Final consumption expenditure	5,229,642.8	342,821.6	4,886,821.2			0.0
Gross capital formation	3,017,488.1	145,104.1	2,872,383.9			0.0
Net exports of goods and	-17,690.8				17,690.8	0.0
Net factor income	-249,945.5				249,945.5	0.0
Net transfers	38,432.4				-38,432.4	0.0
Statistical discrepancy	0.0					
Nonfinancial balances	-229,204.7	-153,225.5	-75,979.2		229,203.9	-0.8

	Economy	Central Govt. Sector	Rest of Economy	Banking System	Rest of the World	Horizontal Check
Central government domestic nonbank financing	0.0	53,130.4	-53,130.4			0.0
External financing of government	32,026.7	32,026.7			-32,026.7	0.0
External financing of non-govt., non-bank sector	195,157.1		195,157.1		-195,157.1	0.0
Change in net foreign assets	-567.6			-567.6	567.6	0.0
of which: Bank Indonesia	-32,967.8			-32,967.8	32,967.8	
commercial banks	32,400.1			32,400.1	-32,400.1	
Change in domestic bank credit	0.0	68,143.5	536,439.8	-604,583.3		0.0
Change in broad money stock (pure flows)	0.0		-405,594.7	405,594.7		0.0
Other items, net (pure flows)	2,587.7		-196,968.5	199,556.3	-2,587.7	0.0
Vertical check	-0.8	75.1	-75.9	0.0	0.0	-0.8

Schematic Flow of Funds Accounts

Transactions/ Sectors	Domestic Economy				Rest of the World	Horizontal Check
	(1)= (2)+(3) + (4)	**Government** (2)	**Private Sector** (3)	**Banking System** (4)	(5)	(1)+ (5)
Gross National Disposable Income (GNDI)	+ GNDI	+ GNDI g	+ GNDI p			
Final Consumption	- C	- Cg	- Cp			
Gross Investment	-I	-Ig	-Ip			
Exports of goods and nonfactor serv.					- X	
Imports of goods and nonfactor serv.					M	
Net factor income					- Yf	
Net Transfers					- TRf	
Non Financial Balances	**(S-I)**	**(Sg-Ig)**	**(Sp-Ip)**	**0**	**- CAB**	**0**
Foreign Financing						
Nonmonetary Financing						
Direct Investment	FDI		FDI		-FDI	**0**
Net Foreign Borrowing	NFB	NFBg	NFBp		- NFB	**0**
Monetary Financing						
Change in Net Foreign Assets	-Δ NFA			-Δ NFA	+Δ NFA	**0**
Domestic Financing						
Monetary Financing						
Domestic Credit		+Δ ...		...C		**0**
Broad Money				...2		**0**
Nonmonetary Financing						
Non Bank		NB...		...Nb		
Net Errors and Omissions	-Δ OINd	Δ OI...		...Nb	Δ OINf	**0**
Vertical Check	**0**	**0**			**0**	**0**

1

Sudden Stop: FDI and NFB ↓. Assume ΔNFA cannot entirely offset.

hematic Flow of Funds Account

Transactions	Total (1)= (2)+(3) + (4)	Domestic Economy			Horizontal Check (1)+ (5)
		Government (2)	**Private Sector** (3)		
Gross National Disposable Income (	+ GNDI	+ GNDI g	+ GNDI p		
Final Consumption	- C	- Cg	- Cp		
Gross Investment	-I	-Ig	-Ip		
Exports of goods and nonfactor serv.				- X	
Imports of goods and nonfactor serv.				M	
Net factor income				- Yf	
Net Transfers				- TRf	
Non Financial Balances	**(S-I)**	**(Sg-Ig)**	**(Sp-Ip)**	**0**	**- CAB** 0
Foreign Financing					
Nonmonetary Financing					
Direct Investment	FDI		FDI	-FDI	**0**
Net Foreign Borrowing	NFB	NFBg	NFBp	- NFB	**0**
Monetary Financing					
Change in Net Foreign Assets	-Δ NFA			-Δ NFA	+Δ NFA **0**
Domestic Financing					
Monetary Financing					
Domestic Credit		+Δ NDCg	+Δ NDCp	-Δ NDC	**0**
Broad Money			-Δ M2	+Δ M2	**0**
Nonmonetary Financing					
Non Bank		NB	-NB		
Net Errors and Omissions	-Δ OINd	Δ OINg	Δ OINp	-Δ OINb	Δ OINf **0**
Vertical Check	**0**	**0**	**0**	**0**	**0** **0**

Internal Adjustment: S-I need to increase.

External Adjustment: CAB need to increase. (Most of it will be done by X-M ↑.)

Schematic Flow of Funds Accounts

Transactions/ Sectors	(1)= (2)+(3) + (4)	Domestic Economy			Rest of the World (5)	Horizontal Check (1)+ (5)
		Government (2)	Private Sector (3)	Banking System (4)		
Gross National Disposable Income (GNDI)	+ GNDI	+ GNDI g	+ GNDI p			
Final Consumption	- C	- Cg	- Cp			
Gross Investment	-I	-Ig	-Ip			
Exports of goods and nonfactor serv.					- X	
Imports of goods and nonfactor serv.					M	
Net factor income					- Yf	
Net Transfers					- TR	
Non Financial Balances	(S-I)	(Sg-Ig)	(Sp-Ip)	0	- CAB	0
Foreign Financing						
Nonmonetary Financing						
Direct Investment	FDI				-FDI	0
Net Foreign Borrowing	NFB	NFBg			- NFB	0
Monetary Financing						
Change in Net Foreign Assets	-Δ NFA				+Δ NFA	0
Domestic Financing						
Monetary Financing						
Domestic Credit		+Δ NDCg				0
Broad Money						0
Nonmonetary Financing						
Non Bank		NB	-NB			
Net Errors and Omissions	-Δ OINd	Δ OINg	Δ OINp	-Δ OINb	Δ OINf	0
Vertical Check	0	0	0	0	0	0

3

2

2

1

The increase in S-I needs to be allocated between government and private sector.

Schematic Flow of Funds Account

Assuming GNDI is given, C_g, I_g, C_p, I_p need to be adjusted. (All likely to decrease.)

Transactions/ Sectors	Domestic Economy (1)= (2)+(3) + (4)	Government (2)	Private Sector (3)	...ne	Horizontal Check (1)+ (5)
Gross National Disposable Income (GNDI)	+ GNDI	+ GNDI g	+ GNDI p		
Final Consumption	- C	- Cg	- Cp		
Gross Investment	-I	-Ig	-Ip		
Exports of goods and nonfactor serv.					- X
Imports of goods and nonfactor serv.					M
Net factor income					- Yf
Net Transfers					- TRt
Non Financial Balances	**(S-I)**	**(Sg-Ig)**	**(Sp-Ip)**	**0**	**- CAB**	**0**
Foreign Financing						
Nonmonetary Financing						
Direct Investment	FDI		FDI		-FDI	**0**
Net Foreign Borrowing	NFB	NFBg	NFBp		- NFB	**0**
Monetary Financing						
Change in Net Foreign Assets	$-\Delta$ NFA			$-\Delta$ NFA	$+\Delta$ NFA	**0**
Domestic Financing						
Monetary Financing						
Domestic Credit		$+\Delta$ NDCg	$+\Delta$ NDCp	$-\Delta$ NDC		**0**
Broad Money			$-\Delta$ M2	$+\Delta$ M2		**0**
Nonmonetary Financing						
Non Bank		NB	-NB			
Net Errors and Omissions	Δ OINg	Δ OINg	Δ OINp	$-\Delta$ OINb	Δ OINf	**0**
Vertical Check	**0**	**0**	**0**	**0**	**0**	**0**

Thank You