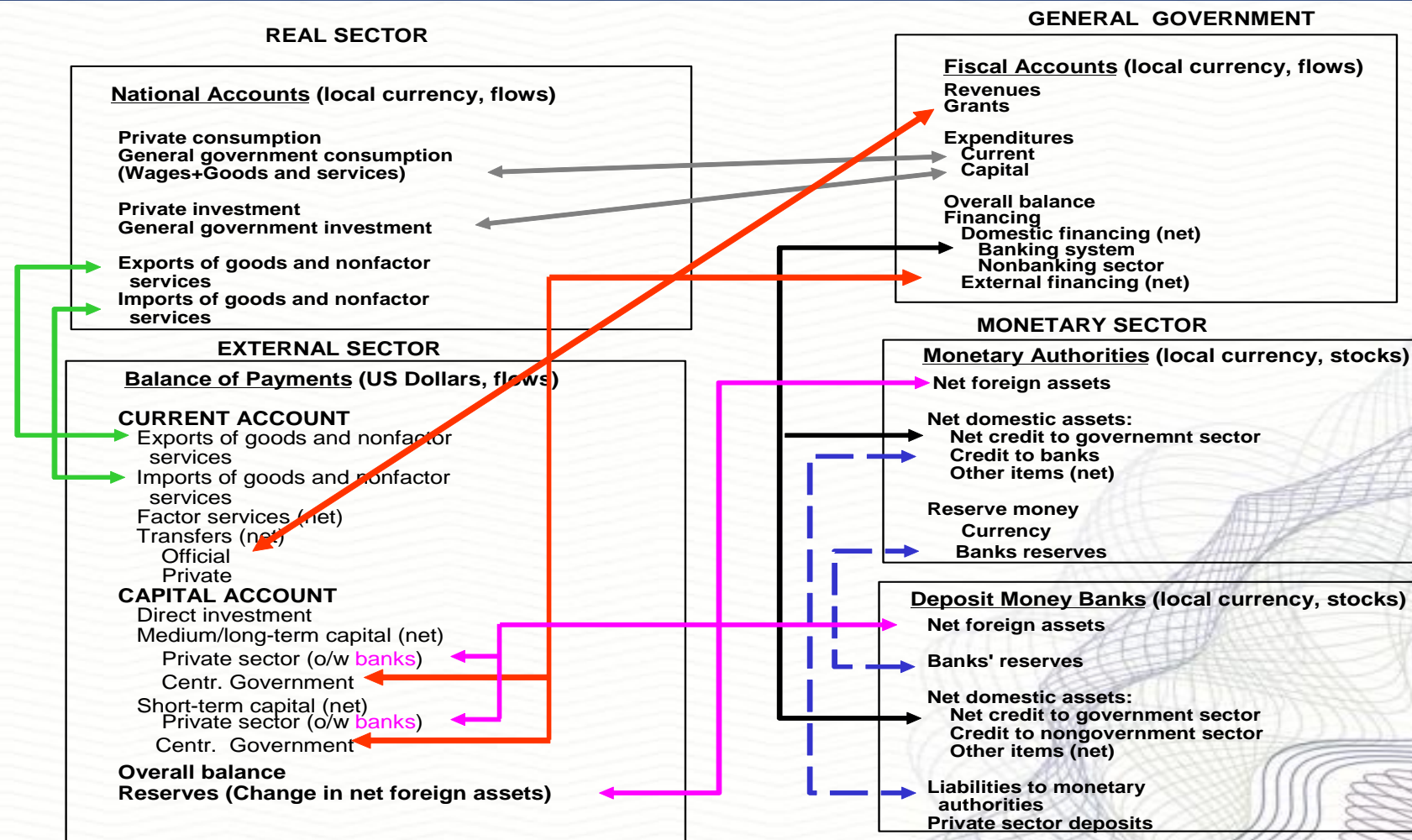


# Macroeconomic Account Interrelation

Jakarta, 23 August 2017



# I. Accounting Links





# Accounts and Analysis

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- ☐ Real Sector accounts
- ☐ External Sector accounts
- ☐ Fiscal accounts
- ☐ Monetary accounts
- ☐ Interrelationships among the accounts



# National Accounts

## Real Transactions

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

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

$$\text{GNDI}_p + \text{GNDI}_g = C_p + C_g + I_p + I_g + \text{CAB}$$

$$\underbrace{\text{GNDI}_p - C_p - I_p}_{S_p - I_p} + \underbrace{\text{GNDI}_g - C_g - I_g}_{S_g - I_g} = \text{CAB}$$

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

$$\text{or } S - I = \text{CAB} = S_f$$



# Balance of Payments

## Current Account

### Real Transactions

Goods  
Services  
Income  
Transfers

## Capital and Financial Account

### Financial Transactions

Direct Investment  
Short, Medium and Long Term Capital  
    Government  
    Private  
Other Net Foreign Assets of Banking System  
Errors and Omissions

## Overall Result

Net International Reserves

## CAB

$X - M$

$Y_f$   
 $TR_f$   
 $K$

FDI

$NFB_g$  }  $NFB$   
 $NFB_p$  }  
 $\Delta NFA$

$OIN_f$   
 $CAB + K$   
 $\Delta NIR$

# Fiscal Account

## Real Transactions

REVENUE	Tax	Revenue	
	Non tax	- interest	
		- <u>transfers (net)</u>	
		= GNDI <sub>g</sub>	
EXPENDITURE			
	Current		
		-C <sub>g</sub>	
	Wages		
	Goods		
	Interest		
	Transfers		
	Capital		
		I <sub>g</sub>	
FISCAL BALANCE = Rev – Exp = S <sub>g</sub> – I <sub>g</sub>			

## Financial Transactions

FINANCING	= - (S <sub>g</sub> – I <sub>g</sub> )	
	External Financing	NFB <sub>g</sub>
	Internal Financing	
	Banking	ΔNDC <sub>g</sub>
	Non-bank	NB
	Other	OIN <sub>g</sub>



# Private Sector Accounts

	<b>Real Transactions</b>
Disposable income	GNDIp
Expenditure	
Consumption	Cp
Investment	Ip
Saving	$Sp = GNDI - Cp$
Sectoral balance	$Sp - Ip$
	<b>Financial Transactions</b>
External financing	
Foreign direct investment	FDI
Net foreign borrowing	NFBp
Domestic borrowing (net)	
Net bank credit	$\Delta NDCp$
Less: Asset holdings	$\Delta M2$
Less: Government bonds	NB
Errors and Omissions	OINp

# Monetary Accounts

## Financial Transactions

### Net Foreign Assets

- Central bank
- Commercial banks

### Net Domestic Assets

- Domestic credit
  - Public sector (net)
  - Private sector
- Other items, net

### Liabilities to Private Sector

- Currency in circulation
- Deposits

where  $NFA + NDA = M2$

### NFA

- NIR
- $NFA_B$

### NDA

- NDC

- $NDC_g$
- $NDC_p$

- $OIN_B$

### M2

- C
- D



# Linkages

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## Balance of payments

$$CAB = X - M + Y_f + TR_f$$

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

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



# Linkages

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## 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

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

## Fiscal accounts

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

## National accounts

$$Y = C + I + CAB$$

## Monetary accounts

$$\begin{aligned}\Delta M2 &= \Delta NDA + \Delta NFA \\ &= \Delta NDCg + \Delta NDCp + OIN \\ &\quad + \Delta NFA\end{aligned}$$



# Linkages: Reserves

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## 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: 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

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

## 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: Credit to Government

## Balance of payments

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

## National accounts

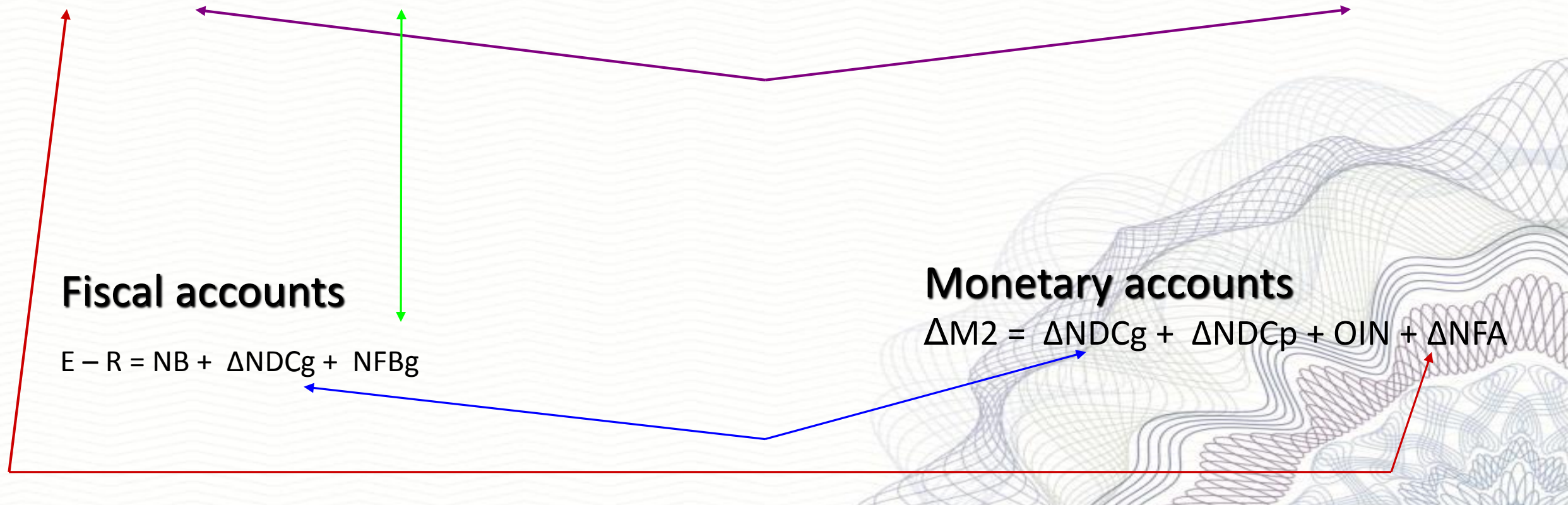
$$Y = C + I + CAB$$

## 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

$$I_p - S_p = \Delta NDCp - \Delta M2 - NB + NFBp + FDI$$

## 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

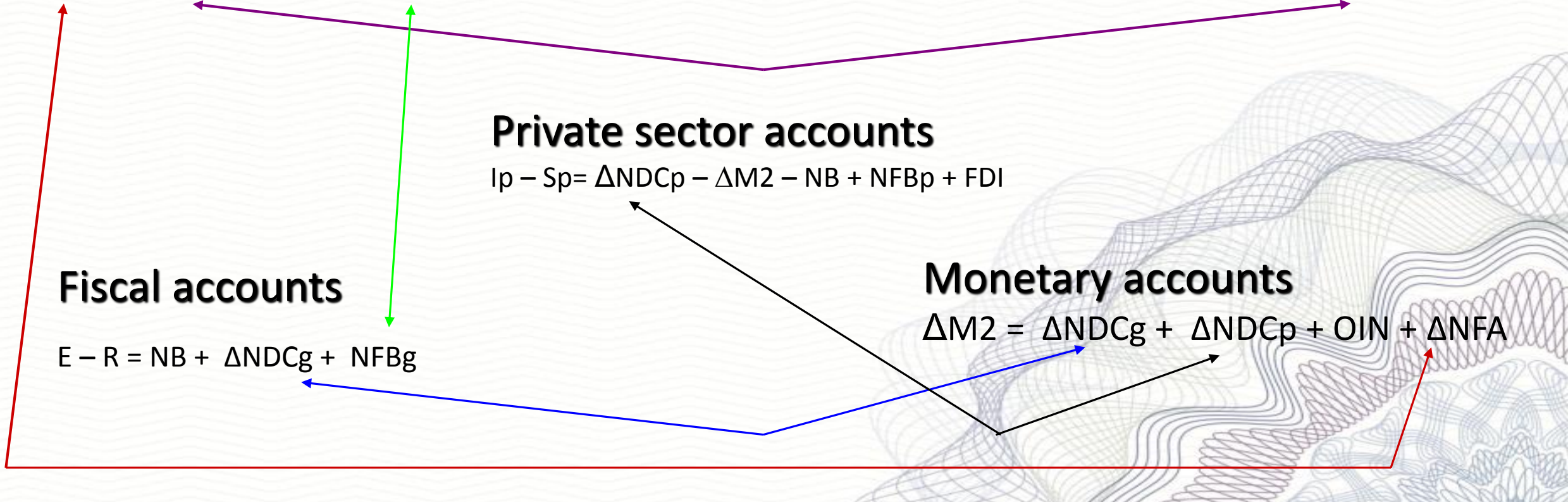
$$I_p - S_p = \Delta NDCp - \Delta M2 - NB + NFBp + FDI$$

## 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

$$I_p - S_p = \Delta NDC_p - \Delta M2 - \cancel{NB} + NFB_p + FDI$$

## Fiscal accounts

$$E - R = NB + \Delta NDC_g + NFB_g$$

## Monetary accounts

$$\Delta M2 = \Delta NDC_g + \Delta NDC_p + OIN + \Delta NFA$$

# Linkages: to BoP

## Balance of payments

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

## National accounts

$$Y = C + I + CAB$$

## Private sector accounts

$$I_p - S_p = \Delta NDCp - \Delta M2 - NB + NFBp + FDI$$

## 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

$$I_p - S_p = \Delta NDCp - \Delta M2 - NB + NFBp + FDI$$

## Fiscal accounts

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

## Monetary accounts

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

# Accounting links (1/3)

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- ❑ “**Exports**” and “**Imports**” in real sector accounts = “**Exports**” 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)

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- ❑ “**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)

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- ❑ “**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

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- ❑ 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	Domestic Economy				Rest of the World	Horizontal Check
	(1)= (2)+( 3) + (4)	Government ( 2)	Private Sector ( 3)	Banking System ( 4)	( 5)	( 1)+ (5)
<b>Gross National Disposable Income ( GNDI)</b>	+ 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	
<b>Non Financial Balances</b>	<b>( S-I)</b>	<b>( Sg-Ig)</b>	<b>( Sp-Ip)</b>	<b>0</b>	<b>- CAB</b>	<b>0</b>
<b>Foreign Financing</b>						
<b>Nonmonetary Financing</b>						
Direct Investment	FDI		FDI		-FDI	0
Net Foreign Borrowing	NFB	NFBg	NFBp		- NFB	0
<b>Monetary Financing</b>						
Change in Net Foreign Assets	-Δ NFA			-Δ NFA	+Δ NFA	0
<b>Domestic Financing</b>						
<b>Monetary Financing</b>						
Domestic Credit		+Δ NDCg	+Δ NDCp	-Δ NDC		0
Broad Money			-Δ M2	+Δ M2		0
<b>Nonmonetary Financing</b>						
Non Bank		NB	-NB			
<b>Net Errors and Omissions</b>	-Δ OINd	Δ OINg	Δ OINp	-Δ OINb	Δ OINf	0
<b>Vertical Check</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>



# Part 1: Non-financial

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- 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). GNDI 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 (**Y<sup>f</sup>** and **TR<sup>f</sup>**).
- Summing up Part 1 provides non-financial balances: **S–I** (i.e., “savings-investment gap”) and **–CAB**.

# Part 2: Financial

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- 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 **– $\Delta$ NFA**.
- Note:  $\text{NFB}^P$  is obtained as  $\text{NFB} - \text{NFB}^G$ .
- Domestic financing: At country level, it sums up to zero. But it can finance sectoral(–)'s.
- Domestic financing includes an increase in domestic credit ( **$\Delta$ NDC**), an increase in M2 ( **$\Delta$ M2**), 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 ( 5 )	Horizontal Check ( 1 )+ ( 5 )
	( 1 )= ( 2 )+ ( 3 ) + ( 4 )	Government ( 2 )	Private Sector ( 3 )	Banking System ( 4 )		
<b>Gross National Disposable Income ( GNDI )</b>	+ 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	
<b>Non Financial Balances</b>	<b>( S-I )</b>	<b>( Sg-Ig )</b>	<b>( Sp-Ip )</b>	<b>0</b>	<b>- CAB</b>	<b>0</b>
<b>Foreign Financing</b>						
<b>Nonmonetary Financing</b>						
Direct Investment	FDI		FDI		-FDI	0
Net Foreign Borrowing	NFB	NFBg	NFBp		- NFB	0
<b>Monetary Financing</b>						
Change in Net Foreign Assets	-Δ NFA			-Δ NFA	+Δ NFA	0
<b>Domestic Financing</b>						
<b>Monetary Financing</b>						
Domestic Credit		+Δ M		+Δ M		0
Broad Money						0
<b>Nonmonetary Financing</b>						
Non Bank		NE		Nb		0
<b>Net Errors and Omissions</b>	-Δ OINd	Δ OINg			Δ OINf	0
<b>Vertical Check</b>	<b>0</b>	<b>0</b>			<b>0</b>	<b>0</b>

1

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



# Schematic Flow of Funds Account

Transaction	Domestic Economy				Horizontal Check (1)+(5)
	(1)= (2)+(3)+(4)	Government (2)	Private Sector (3)	External Sector (4)	
<b>Gross National Disposable Income</b>	+ GNDI	+ GNDI <sub>g</sub>	+ GNDI <sub>p</sub>		
Final Consumption	- C	- C <sub>g</sub>	- C <sub>p</sub>		
Gross Investment	- I	- I <sub>g</sub>	- I <sub>p</sub>		
Exports of goods and nonfactor serv.				- X	
Imports of goods and nonfactor serv.				M	
Net factor income				- Y <sub>f</sub>	
Net Transfers				- TR <sub>f</sub>	
<b>Non Financial Balances</b>	<b>( S-I )</b>	<b>( S<sub>g</sub>-I<sub>g</sub>)</b>	<b>( S<sub>p</sub>-I<sub>p</sub>)</b>	<b>0</b>	<b>- CAB</b>
<b>Foreign Financing</b>					
<b>Nonmonetary Financing</b>					
Direct Investment	FDI		FDI	-FDI	0
Net Foreign Borrowing	NFB	NFB <sub>g</sub>	NFB <sub>p</sub>	- NFB	0
<b>Monetary Financing</b>					
Change in Net Foreign Assets	-Δ NFA			-Δ NFA	+Δ NFA
<b>Domestic Financing</b>					
<b>Monetary Financing</b>					
Domestic Credit		+Δ NDC <sub>g</sub>	+Δ NDC <sub>p</sub>	-Δ NDC	0
Broad Money			-Δ M2	+Δ M2	0
<b>Nonmonetary Financing</b>					
Non Bank		NB	-NB		
<b>Net Errors and Omissions</b>	-Δ OIN <sub>g</sub>	Δ OIN <sub>g</sub>	Δ OIN <sub>p</sub>	-Δ OIN <sub>b</sub>	Δ OIN <sub>f</sub>
<b>Vertical Check</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Internal Adjustment:** S-I need to increase.

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

2

1

2

## 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)
<b>Gross National Disposable Income ( GNDI)</b>	+ 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	
<b>Non Financial Balances</b>	<b>2</b> ( S-I)	<b>3</b> ( Sg-Ig)	( Sp-Ip)	0	<b>2</b> - CAB	0
<b>Foreign Financing</b>						
<b>Nonmonetary Financing</b>						
Direct Investment	FDI				- FDI	0
Net Foreign Borrowing	NFB	NFBg			- NFB	0
<b>Monetary Financing</b>						
Change in Net Foreign Assets	-Δ NFA				+Δ NFA	0
<b>Domestic Financing</b>						
<b>Monetary Financing</b>						
Domestic Credit		+Δ NDCg				0
Broad Money						0
<b>Nonmonetary Financing</b>						
Non Bank		NB	NB			
<b>Net Errors and Omissions</b>	-Δ OINd	Δ OINg	Δ OINp	-Δ OINb	Δ OINf	0
<b>Vertical Check</b>	0	0	0	0	0	0

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



## Schematic Flow of Funds Account

Transactions/ Sectors	Domestic Economy				Foreign	Horizontal Check (1)+(5)
	(1)= (2)+(3) + (4)	Government (2)	Private Sector (3)	Rest of the World (4)		
<b>Gross National Disposable Income ( GNDI)</b>	+ GNDI	+ GNDI <sub>g</sub>	+ GNDI <sub>p</sub>			
Final Consumption	- C	- C <sub>g</sub>	- C <sub>p</sub>			
Gross Investment	- I	- I <sub>g</sub>	- I <sub>p</sub>			
Exports of goods and nonfactor serv.				- X		
Imports of goods and nonfactor serv.				M		
Net factor income				- Y <sub>f</sub>		
Net Transfers				TR <sub>f</sub>		
<b>Non Financial Balances</b>	<b>( S-I)</b>	<b>( S<sub>g</sub>-I<sub>g</sub>)</b>	<b>( S<sub>p</sub>-I<sub>p</sub>)</b>	<b>0</b>	<b>- CAB</b>	<b>0</b>
<b>Foreign Financing</b>						
<b>Nonmonetary Financing</b>						
Direct Investment	FDI		FDI		-FDI	0
Net Foreign Borrowing	NFB	NFB <sub>g</sub>	NFB <sub>p</sub>		- NFB	0
<b>Monetary Financing</b>						
Change in Net Foreign Assets	-Δ NFA			-Δ NFA	+Δ NFA	0
<b>Domestic Financing</b>						
<b>Monetary Financing</b>						
Domestic Credit		+Δ NDC <sub>g</sub>	+Δ NDC <sub>p</sub>	-Δ NDC		0
Broad Money			-Δ M2	+Δ M2		0
<b>Nonmonetary Financing</b>						
Non Bank		NB	-NB			
<b>Net Errors and Omissions</b>	Δ OIN <sub>g</sub>	Δ OIN <sub>g</sub>	Δ OIN <sub>p</sub>	-Δ OIN <sub>b</sub>	Δ OIN <sub>f</sub>	0
<b>Vertical Check</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

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

**Thank You**

