

# Session 2. The IMF's macroeconomic framework

## 1. Overview of the Macro Framework

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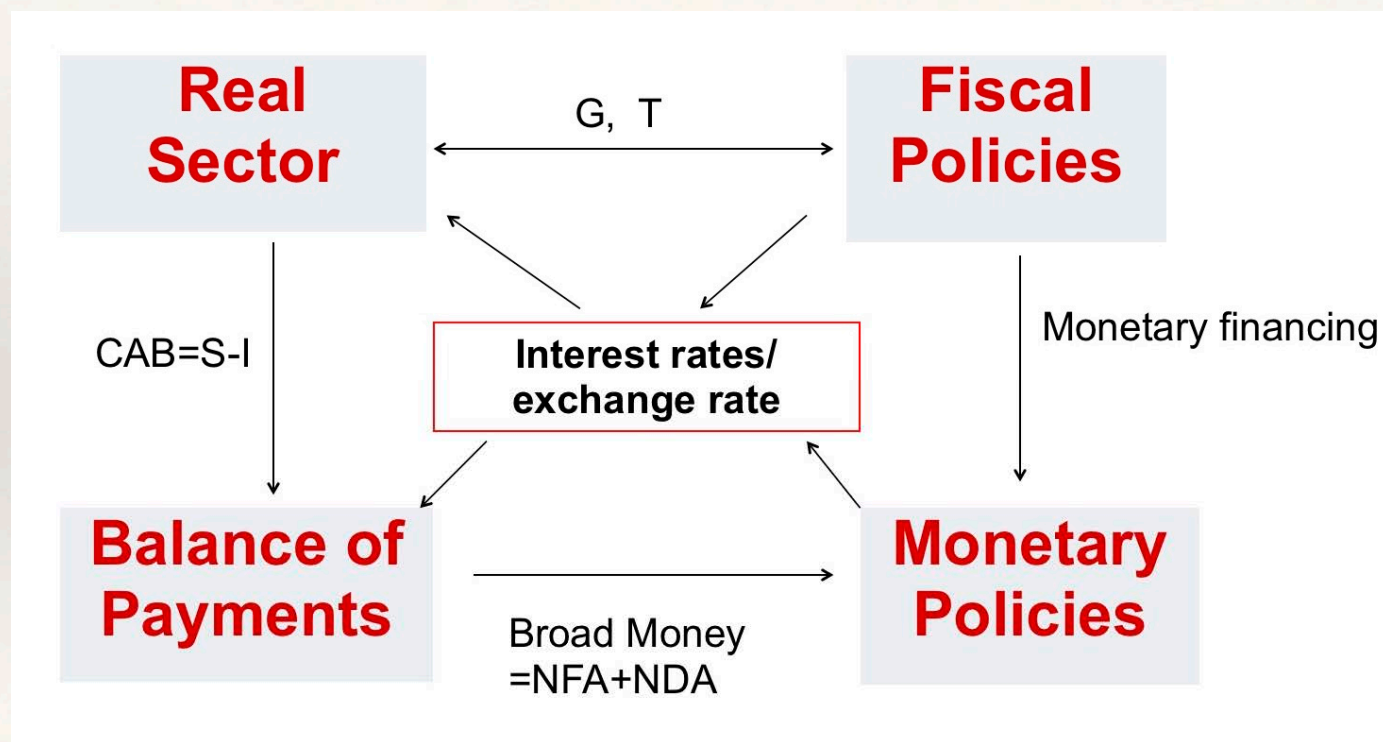
# Some takeaways

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- ❖ **Linkages** between sectors and policies are critical
- ❖ **Financial programming (FP)** is a tool for ensuring accounting and economic consistency in economic analysis and projections
- ❖ FP can help diagnose economic **imbalances (domestic or external) and policy fixes**
  - ❖ FP is also basis for IMF-supported **financial programs**
- ❖ FP is **not** itself an economic **model**, but can be made consistent with any model and behavioral assumptions
  - ❖ **Who might need FP?**

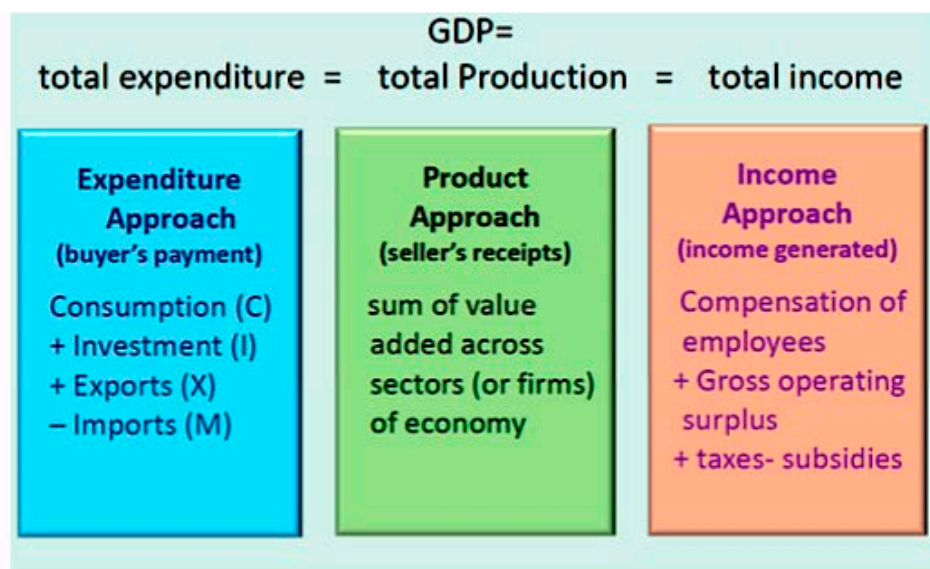
Macroeconomic linkages

# Main Macroeconomic Sectors



# Real sector: GDP

## Equivalence between GDP Measures



# Fiscal policy: Simplified accounts

## GFSM 1986\*

<b>REVENUE</b>
<b>EXPENDITURE</b>
Current
Primary
Interest payments
Capital
<b>NET LENDING (POLICY LOANS)</b>
<b>OVERALL BALANCE</b>
<b>FINANCING</b>
External
Domestic
Privatization

## GFSM 2001/14\*

<b>REVENUE</b>
<b>EXPENSE</b>
Primary
Interest payments
<b>NET/GROSS OPERATING BALANCE</b>
<b>NET ACQUISITION OF NON-FIN. ASSETS</b>
<b>EXPENDITURE</b>
<b>NET LENDING/BORROWING</b>
<b>NET ACQ. OF FIN. ASSETS</b>
<b>NET INCURRENCE OF LIABILITIES</b>

# Fiscal balance

## Why overall balance?

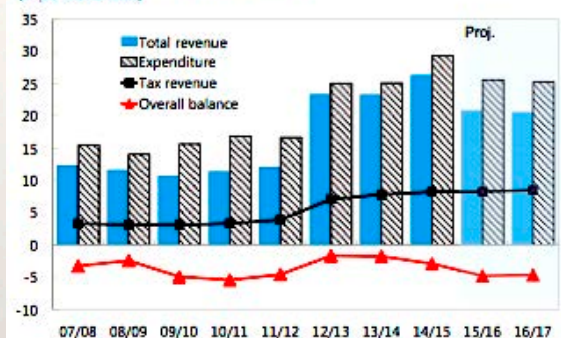
- Reflects borrowing needs of government—how broad a definition of government?
- Change in overall balance a proxy for impact of fiscal policy on aggregate demand
- Key determinant of debt sustainability

Other important indicators of fiscal health—  
Cyclically adjusted balance

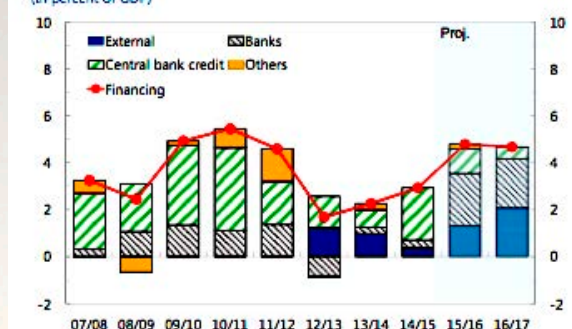
## How financed?

- Key to analyzing potential risks, impact on inflation

**Fiscal Revenue and Expenditure**  
(In percent of GDP)



**Fiscal Financing**  
(In percent of GDP)



# Main Macroeconomic Sectors—Monetary Sector

## Central bank objectives & functions:

### Monetary Stability

- Monetary policy
- Exchange rate policy

### Financial stability

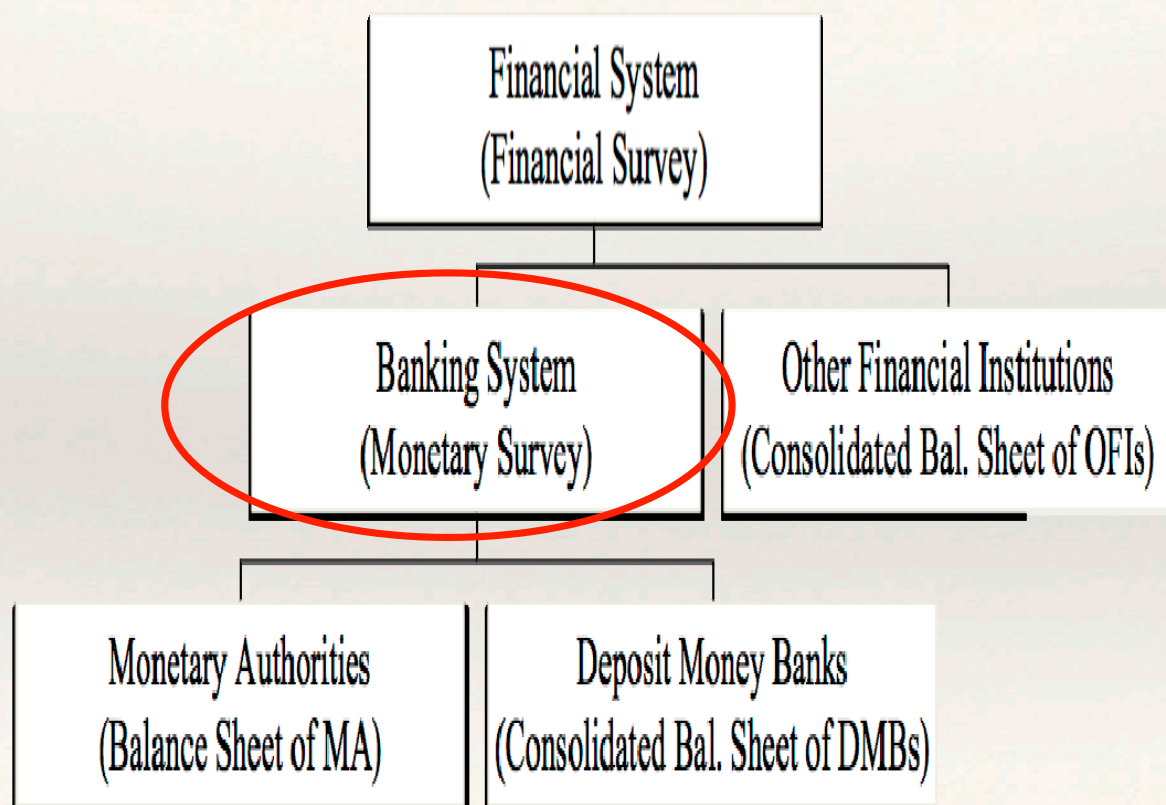
- Prudential policy
- Supervision, oversight

### Policy Operation Functions

- FX intervention
- FX reserve management
- Liquidity management
- Lender of last resort

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## Scope of the monetary sector



# Monetary survey: the banking system

## ASSETS

- Net Foreign assets (NFA)
- Net Domestic assets (NDA)
  - Net credit to government (NCG)
  - Credit to private sector (CPS)
  - Other Items, net (OIN)

## LIABILITIES

- Broad Money (M)
  - Narrow money (NM)
    - Currency in circulation (CY)
    - Demand deposits (DD)
  - Quasi money (QM)
    - Time & savings deposits (TD)
    - Foreign currency deposits (FC)

$$M = NFA + NDA$$

# The external sector: Balance of payments

- **Current account deficit (surplus)** means country spends more (less) on goods of other countries than it receives

- **Current account deficit needs to be financed, which implies capital inflow**

- **Positive (negative) CA means country net lender (borrower) to RoW**  
 $CA = S - I$

- **If normal flows don't cover deficit, need to finance by drawing down reserves or via official (IMF) financing**

- **Links with macro policies – twin deficits**

**Records transactions with non-residents**

## Basic structure of the Balance of Payment:

Current Account

Capital and Financial Account

Overall Balance

Financing

# Balance of Payments: Details

(usually in US\$ or euros)

## Current Account (CAB)

Trade

Exports

Imports

Services

Primary Income

Interest

Profits

Wages

Secondary Income, net

## Capital and Financial Account

Capital Account

Financial Account

Direct Investment, net

Portfolio Investment, net

Equity

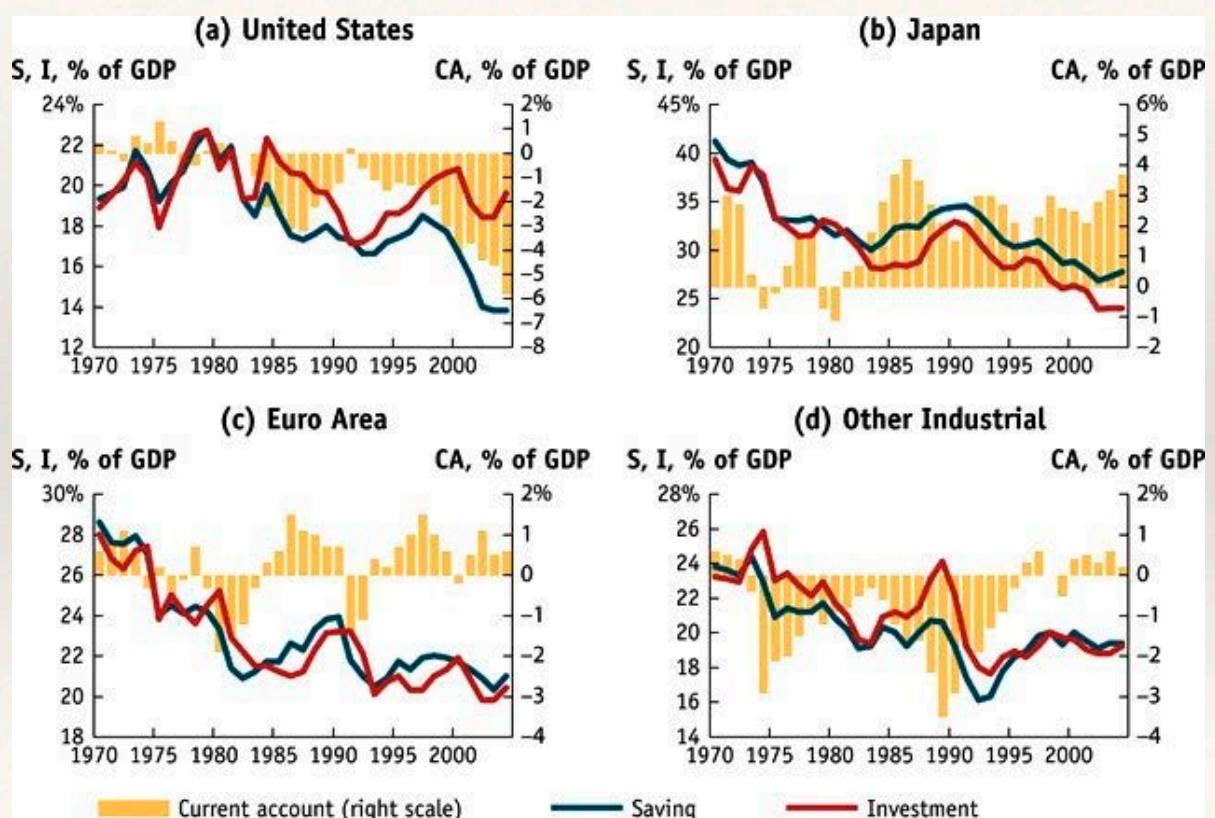
Debt

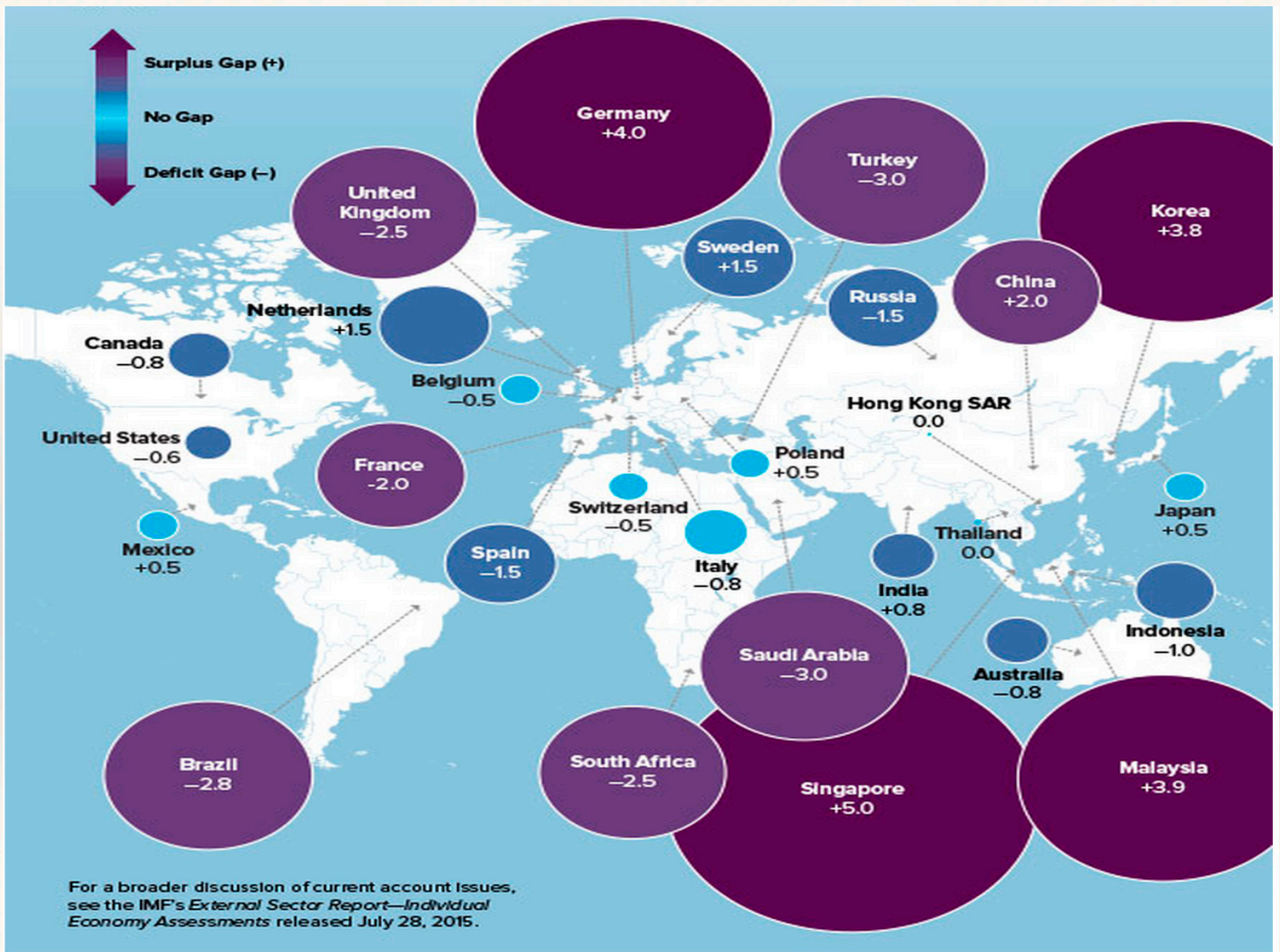
Other Investment, net

$\Delta$  in International Reserves

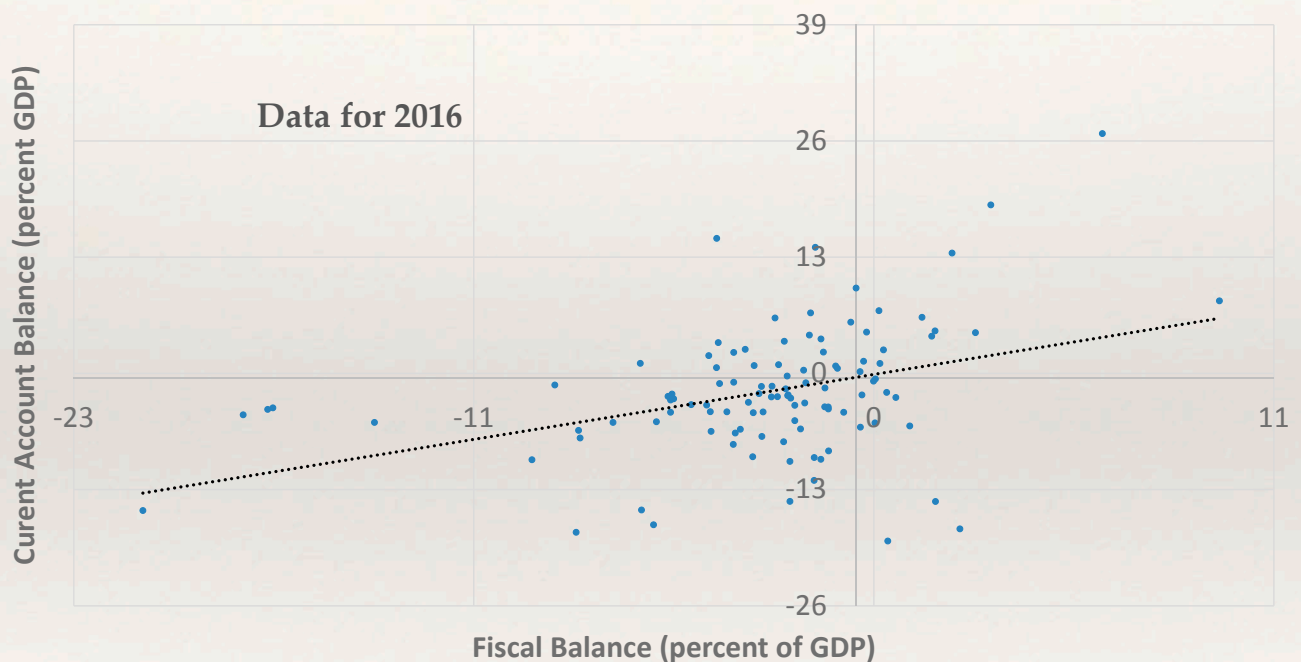
Errors and Omissions

# Link with National Accounts





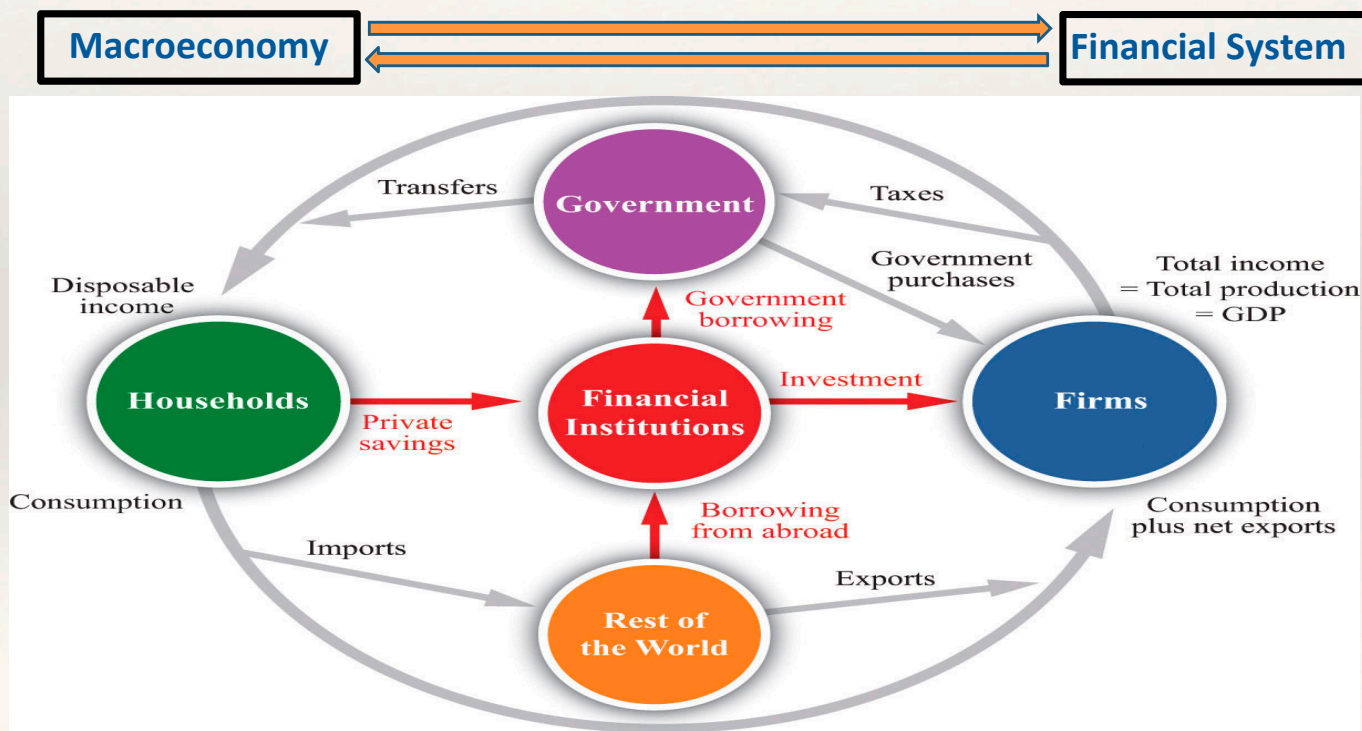
## Fiscal-external links: Twin deficits?





# Macro-financial linkages

Macro-financial linkages arise from the key role of the financial system in channeling savings to investment



## Financial programming

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# What is a financial program?

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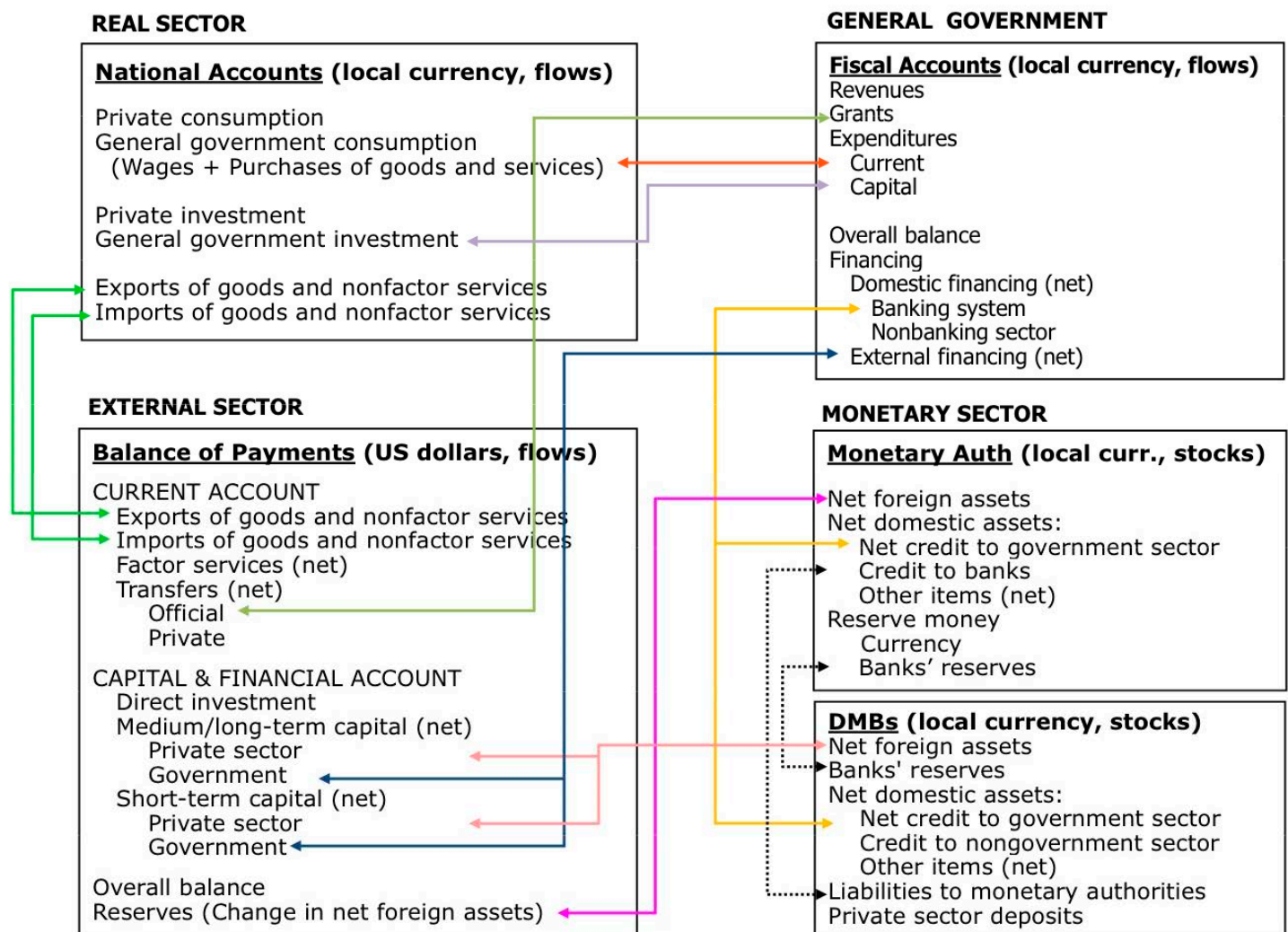
- ❖ A **consistent framework of macroeconomic accounts and linkages**
  - ❖ Utilized in medium-term projections, but **not a formal model or forecasting tool** by itself
- Can be consistent with *any* formal model. Need for **behavioral content**
- ❖ **Accounting consistency:** One variable per sector as residual. Also cross-checks across accounts
- ❖ **Economic consistency:** What is the “story”? Does it make sense? What policies are assumed?
  - ❖ **Identifying problems:** Consistent story doesn't mean good story
  - ❖ Used to **design policies** and set **targets** especially in IMF programs

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## Three types of links

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- ❖ **Accounting identities:** Entries should be exactly the same (may not be due to measurement error), e.g.:
  - **Exports and imports** in real sector accounts equal exports and imports in BoP
  - $\Delta$  **Credit to government** in monetary account = Domestic bank financing in fiscal account
  - **Government consumption** in national accounts equal current expenditure in fiscal accounts
  - **External CA deficit** = National S - I
- ❖ **Strong accounting links:** Entries closely related but not identical, e.g.:
  - ❖ E.g. change in the exchange rate introduces gap between  $\Delta$ NFA in monetary and BOP accounts
- ❖ **Behavioral links everywhere!** Does the FP make economic sense?



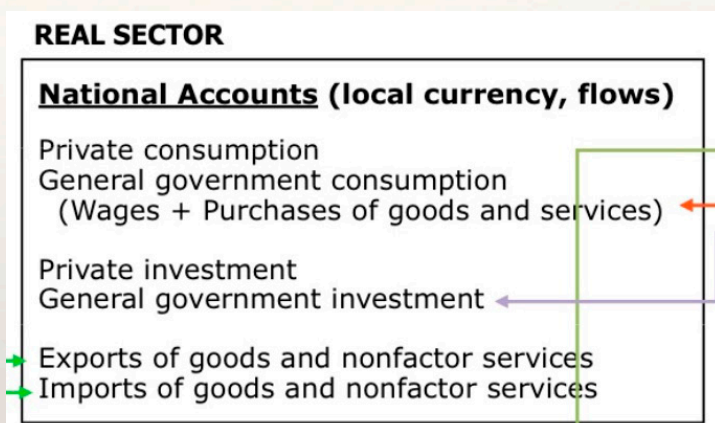
## Building a baseline: Basic steps

1. Project **baseline** under **existing** policies, typically:
  - **Real (GDP) → External (BoP) → Fiscal → Monetary**
2. Check **accounting** consistency
3. Check **economic** consistency: the “story”
4. **Iterate!**

# Forecasting national accounts

## ❖ Forecast real output

- **Supply**: Determinants of potential growth,  $Y=f(A, K, L)$
- **Demand**: Expenditure side of GDP,  $Y=C+I+G+(X-M)$ 
  - Line-by-line, using models, regressions, rules-of-thumb, discussion with government
  - Role of policies
- **Reconcile** supply and demand sides—**judgment** needed
- **Short-term** (cyclical) vs **long-term** (potential)



- ❖ **Forecast prices**—GDP deflator
- ❖ **Nominal forecasts**

# Determinants of private consumption

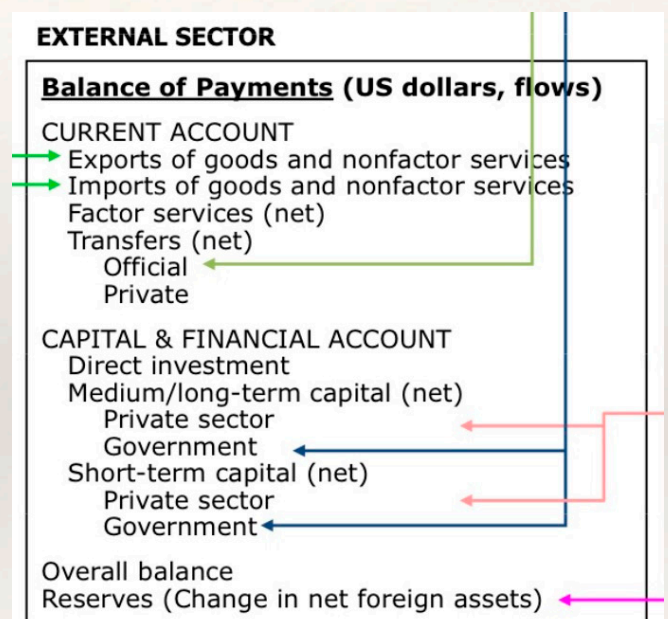
- ❖ **Disposable income**
  - ❖ **Net worth**—impact of asset booms and busts
    - ❖ **Interest rates**, access to credit
    - ❖ **Demographics**: life-cycle behavior
  - ❖ Impact of **government** and **corporate** savings?
    - ❖ **Social safety nets and other policies**

# Analyzing private investment

- ❖ **Structural component.** Maintenance spending less depreciation
  - ❖ **Interest rate.** Higher real  $r$  means fewer profitable projects
  - ❖ **Accelerator effects.** Faster growth means higher investment—maintain capital-output ratio; growth lowers risk premia
  - ❖ **Corporate balance sheets.** Stronger balance sheets mean more collateral, easier self-financing—Tobin's  $Q$ .
    - ❖ **Cash flow/liquidity.** Access to credit
    - ❖ **“Animal spirits”**—expected future demand
    - ❖ **Taxation/subsidies**

# Forecasting the external sector

- ❖ **Forecast imports and exports:** Key variables include income (own and partners), exchange rates, terms of trade
- ❖ **Net interest payments** depend on external debt outstanding, new debt, interest rates, risk premia
- ❖ **Official transfers** based on past trends, discussions with country and donors. **Private transfers** (remittances) based on history, plausible assumptions
- ❖ **Capital account** most difficult—track record, country plans, global environment, country risk
- ❖ **Reserves** are either a residual or target, in program context

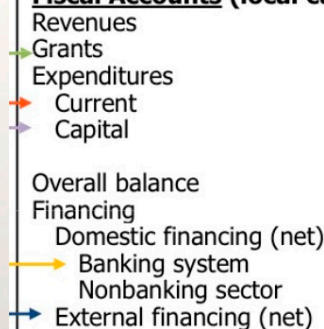


# Forecasting the fiscal sector

- ❖ **Revenue** based on real economy, inflation, measures:
  - Changes in tax base, effective rates
- ❖ **Non-interest spending:** Mandated (e.g. pensions) vs. discretionary
- ❖ **Interest payments:** Depends on debt level and structure, interest rates, and exchange rate
  - Estimation iterative, since depends on new debt, which is function of primary deficit

## GENERAL GOVERNMENT

### Fiscal Accounts (local currency, flows)



- ❖ **Financing: External financing from BoP.** Domestic financing as a residual and/or plausible assumptions (as a start)
- ❖ **Discussions** with government officials are critical.

# Forecasting the monetary sector

- ❖ **Demand for money:** Forecast money demand equation or velocity:
  - $M_d/P = f(Y, i)$       **Stable?**
  - $MV = PQ$
- ❖ **Money supply:  $M2 = NFA + NDA$** 
  - NFA comes from BoP
  - Government credit from fiscal accounts (or vice versa)
  - $NDA - \text{Credit to government} = \text{Credit to private sector}$
- ❖ **Reconcile** money demand and supply: May need to look again at other sectors—e.g. inflation.
- ❖ **Projecting reserve money:** The money multiplier

## ASSETS

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# Assessing the baseline forecast

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- ❖ Do **accounting identities** hold?
  - ❖ Does **the story** make sense? Top-down vs. bottom-up approaches
  - ❖ Macro **imbalances or vulnerabilities**? Policy goals met?
- ❖ Is **monetary** expansion too rapid? Is the fiscal stance sustainable?  
Is **CA deficit** too large? Is **investment** sufficient?
  - ❖ Are results **sensitive** to changes in key assumptions?
    - ❖ What sorts of **policy changes** may be required?
      - ❖ **Revise, as necessary!**

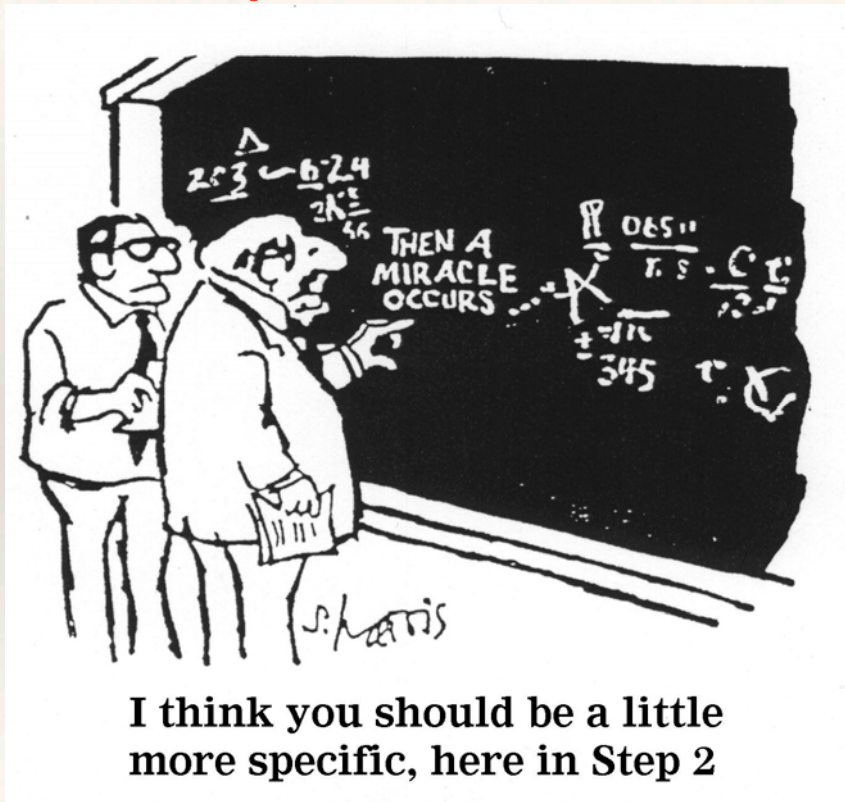
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## Checks on economic consistency: Examples

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- ❖ **Time series**. Many variables follow trends, e.g. national savings. If not the case in FP, is there a reason?
- ❖ **Monetary**. Is rate of money growth consistent with inflation and growth projections? Is projected credit growth consistent with GDP growth?
- ❖ **Fiscal**. Is the deficit consistent with projected interest rate and private investment (crowding out)?
- ❖ **External**. Are inflows consistent with monetary policy or global outlook?  
Are trade projections consistent with key projected global prices?
  - ❖ **Sustainability**. Are developments in fiscal and external sectors consistent with sustainability?

# Don't assume away the problem!



From baseline to program



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# From baseline to policies

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- ❖ **Baseline** projections are based on “**no policy changes**”
- ❖ Baseline may be internally consistent but still fail to achieve **growth objectives** or may reveal **imbalances**, e.g. high inflation, unsustainable debt, too large CA deficits, balance sheet risks
- ❖ **Policies** should be designed to address these imbalances
- ❖ What **sources** of imbalance? E.g. excessive government spending, overvalued exchange rate, rapid monetary expansion, large corporate borrowing?
- ❖ **Seriousness** of imbalances? Do they need to be addressed immediately, gradually?
- ❖ **Re-do financial programming exercise** with new policies—iterative process

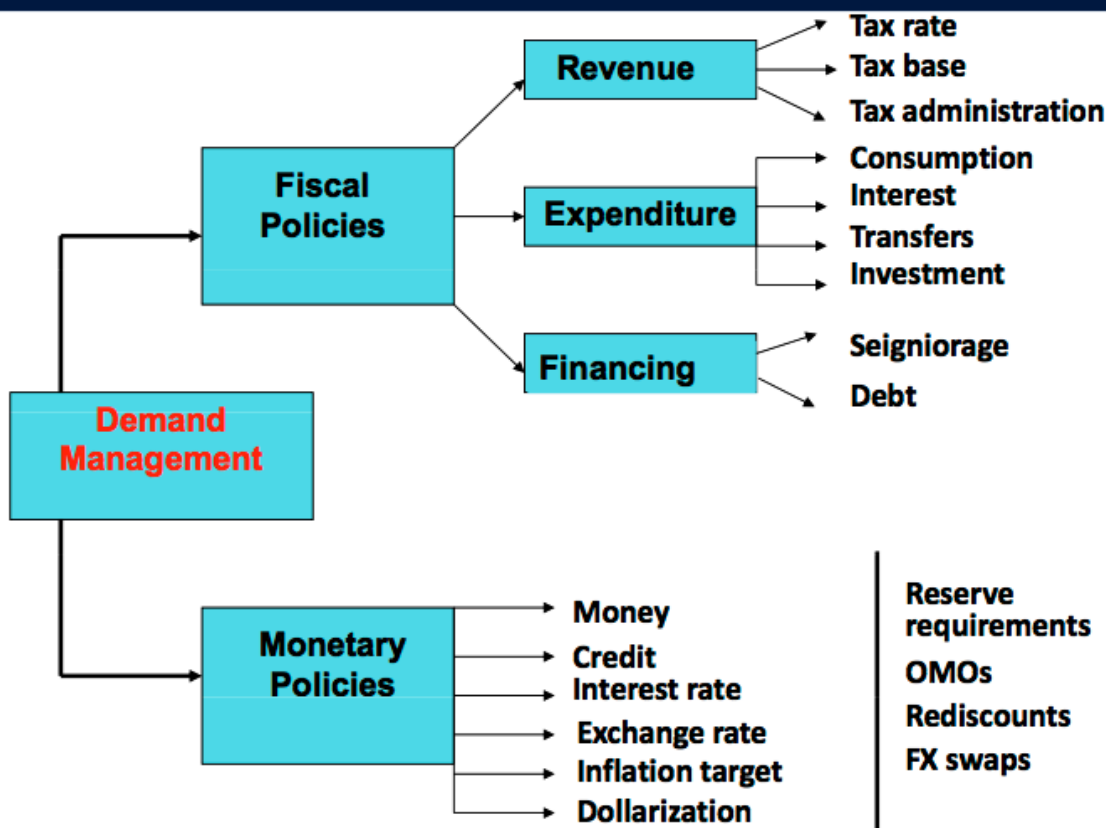
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## What kinds of policies?

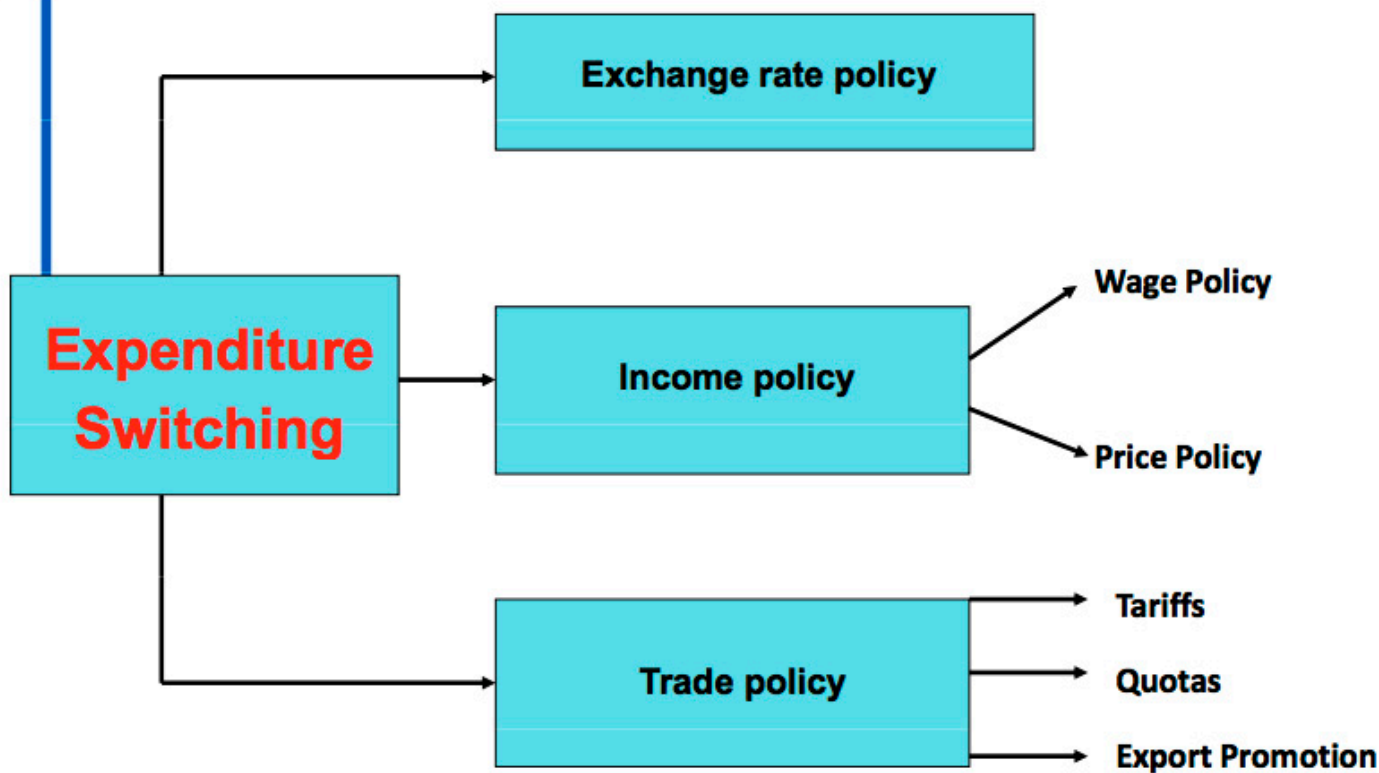
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- ❖ Fiscal/external imbalances typically require some adjustment—**demand management**
- ❖ External imbalances can also be addressed via changes in exchange rate, income, or trade policies—**expenditure switching**
- ❖ Raising potential growth and limiting financial risks require **structural reforms**. Focus will vary across countries.

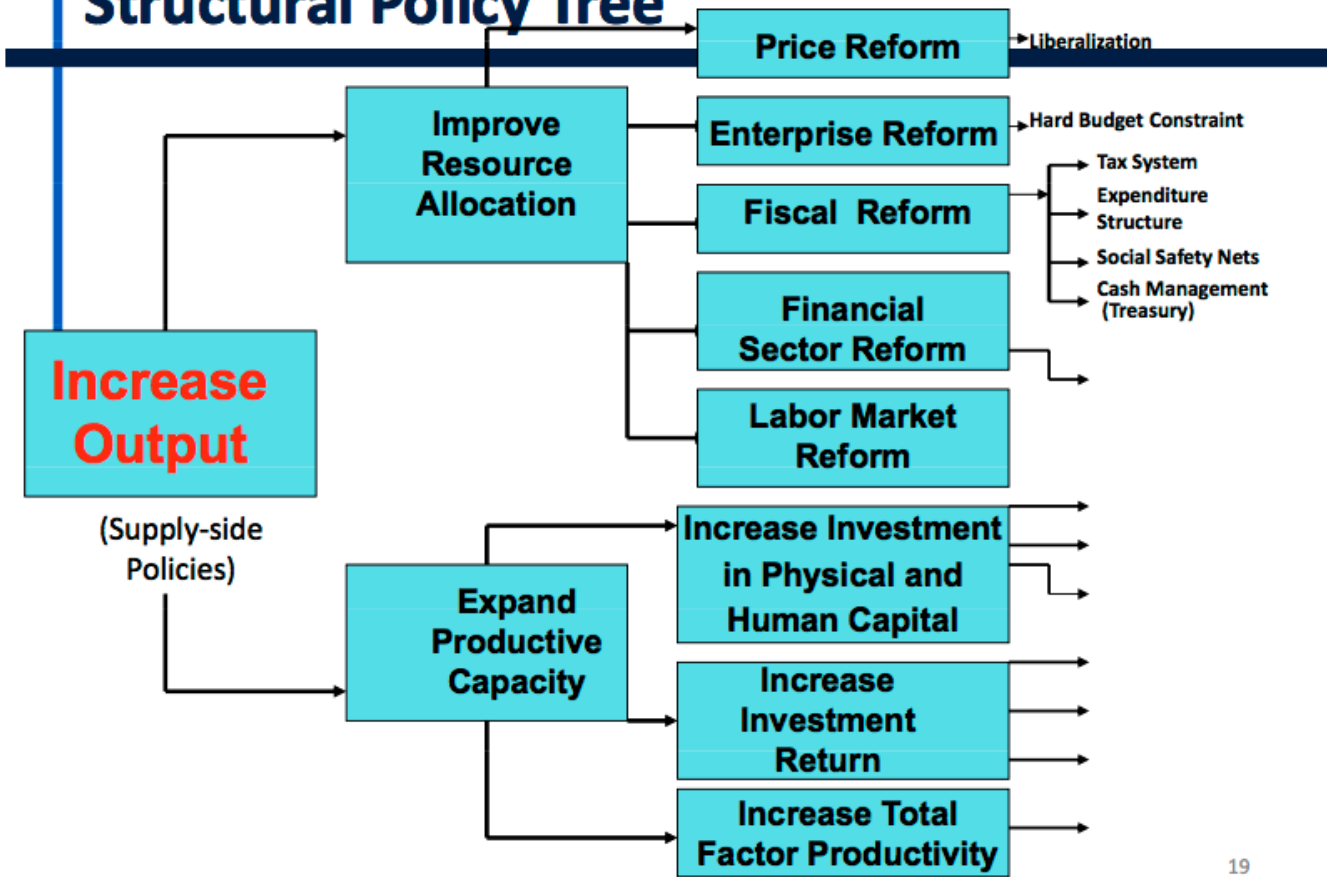
# Demand Management Policy Tree



# Expenditure Switching Policy Tree



# Structural Policy Tree



Setting program targets

# Setting monetary targets

$$\text{Monetary: } \Delta M = \Delta NDA + \Delta NFA = \Delta DC + \Delta R$$

- Programs often use ceiling on **domestic credit** to control M growth and meet **inflation target**. In that case, R can be residual.
- But building **reserves** is, in many cases, a policy goal. So, often, a floor is set on R and DC is a policy variable.
  - ❖ **How large do reserves need to be?**
- Correct approach depends stability of money demand and on exchange rate and capital controls regime—e.g. free-floating XR doesn't require reserves. With fixed XR, reserves are residual.

# Setting fiscal targets

$$\text{Fiscal: } FB \approx \Delta DC_g + F_g$$

- ❖  $\Delta DC$  is from monetary sector and  $F_g$  from external
  - ❖ FB is set consistent with the identity above
    - ❖ If its judged that this FB is too tight can seek other financing, but then need to reexamine debt sustainability and/or crowding-out of private credit.
- ❖ Other sources of financing exist as well, e.g. nonbank purchases of bonds, or IMF budget financing.

# Setting external targets

$$\text{External: } M - X + iL_f = F_p + F_g - \Delta R$$

- ❖ Project  $M$ ,  $X$ ,  $F_p$  and  $R$  target, and treat  $F_g$  as a residual.
- ❖ Is there a "**financing gap**"? If so, need new additional financing and/or adjustment to bring down CA deficit.
- ❖ Alternatively,  $F_p$  and  $X$  can be projected separately.  $F_g$  is then set at a sustainable level of external debt.
- ❖  $\Delta R$  is set as a target, and  $M$  is a residual. Compare this  $M$  to a benchmark  $M$  projected separately, to judge realism

# Ensuring a fully-financed program

• For IMF lending, a program must be **fully financed**—on both fiscal and BOP side—and public **debt** must be **sustainable**. If this doesn't hold options include:

- Lower fiscal deficits/slower growth
- Loans and debt relief by official creditors
- Commitment of private creditors to roll-over debt (e.g. Vienna Initiative)
  - Catalytic role of IMF lending
  - Debt restructuring

**Gross financing need**=deficit + amortization of debt

**Financing gap**=Gross financing need - Identified funding

	Total Financing 2017-2022
Financing	5,650
IMF	425
Other IFIs	1,500
World Bank 1/ o/w project financing	600 175
ADB o/w project financing	900 300
Bilateral donors	1,550
Japan	850
Korea o/w project financing	700 700
PBOC swap line	2,175

Sources: Fund staff projections.

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# Adjustment vs. financing

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- ❖ **Program design** needs to make a basic decision: How much of an imbalance should be addressed by adjustment and how much by financing?
- ❖ Relying mainly on financing makes sense when imbalance is seen as **short-term** in nature and when resources available at a reasonable **cost**.
- ❖ IMF financial support limits needed **short-term adjustment** but adds to future **debt**. So no impact on ultimate adjustment?
- ❖ But IMF support allows **orderly and gradual adjustment**, easing burden and allowing for **supply-side** response
- ❖ Also, more **credible policies** can lower costs of adjustment and allow return to market borrowing at lower rates

Extra slides

# Balance Sheet of Central Bank

$$RM = NFA + NDA$$

Assets	Liabilities
Net foreign assets (NFA)	Reserve money (RM)
Net domestic assets (NDA)	Currency issued
Net claims on the government (NCG)	Held in banks
Claims on commercial banks	Held outside banks
Claims on other resident sectors	Deposits (reserves) of commercial banks with central bank
Outstanding CB securities (liabilities → Increase: minus sign Decrease: plus sign)	Other deposits
Other items net	

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## Central Bank Balance Sheet Examples (1)

- Example (1): On the first day of its operations, the central bank decides to buy foreign currency worth Kip 100 from commercial banks:

<u>Assets</u>		<u>Liabilities</u>	
CB's NFA	100	Reserve money	100
Foreign exchange	100	Currency in circulation	0
CB's NDA		Deposits of commercial banks	100

## Central Bank Balance Sheet Examples (2)

- Note we keep the previous transaction (Example 1) as a starting point.
- Example (2): Next, the central bank provides credit of Kip 100 to government, which uses this credit to pay its suppliers:

<u>Assets</u>		<u>Liabilities</u>	
<b>CB's NFA</b>	<b>100</b>	<b>Reserve money</b>	<b>200</b>
Foreign exchange	100	Currency in circulation	100
<b>CB's NDA</b>	<b>100</b>	Deposits of commercial banks	100
Net domestic credit	100		

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## Central Bank Balance Sheet Examples (3)

- Example (3): The central bank engages in **open market operations** to reduce base money supply by selling central bank securities of Kip 100 to commercial banks:

<u>Assets</u>		<u>Liabilities</u>	
<b>CB's NFA</b>	<b>100</b>	<b>Reserve money</b>	<b>100</b>
Foreign exchange	100	Currency in circulation	100
<b>CB's NDA</b>	<b>0</b>	Deposits of commercial banks	0
Net domestic credit	0		
<i>NCG</i>	<i>100</i>		
<i>Net Claims on commercial banks</i>	<i>-100</i>		
<i>Claims</i>	<i>0</i>		
<i>Liabilities</i>	<i>100</i>		

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# Commercial Bank Accounts

## Analytical Balance Sheet of Commercial Banks

Assets	Liabilities
<b>Net foreign assets (NFA)</b>	<b>Deposits</b>
<b>Net domestic assets (NDA)</b>	Demand deposits
<b>Claims on the central bank</b>	Time and saving deposits
○ Currency held in vaults	Foreign currency deposits
○ Deposits at the central bank	<b>Liabilities to the central bank</b>
○ Holding of CB securities	
<b>Domestic credit</b>	
○ Net credit to the government	
○ Credit to private sector	
<b>Other items net</b>	

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## Monetary Survey: Consolidation of Central Bank and Commercial Bank Balance Sheets

Central Bank	
Assets	Liabilities
<b>Net Foreign Assets</b>	<b>Reserve money (RM)</b>
<b>Net Domestic Assets</b>	Currency issued
Net claims on the government	Held in banks
Claims on commercial banks	Held outside banks
Claims on other resident sector	Deposits of commercial banks
Other items net	Other deposits

Commercial Banks	
Assets	Liabilities
<b>Net Foreign Assets</b>	<b>Deposits</b>
<b>Net Domestic Assets</b>	Demand deposits
Claims on the central bank	Time and saving deposits
Currency held in vaults	Foreign currency deposits
Deposits at the central bank	<b>Liabilities to the central bank</b>
Domestic credit	
Other items net	

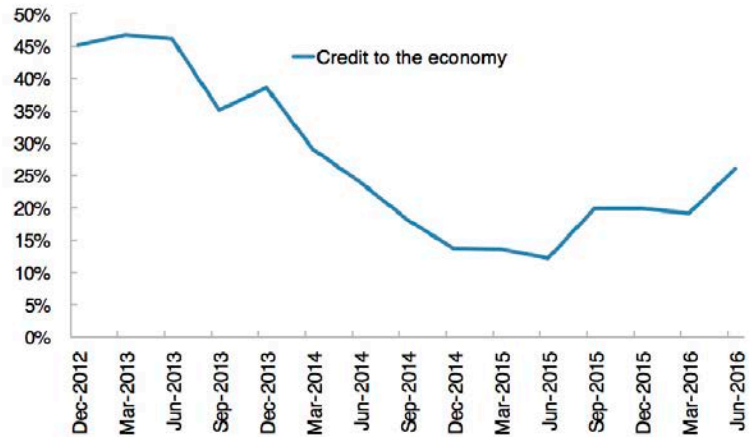
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# Monetary Survey—Why Does It Matter?

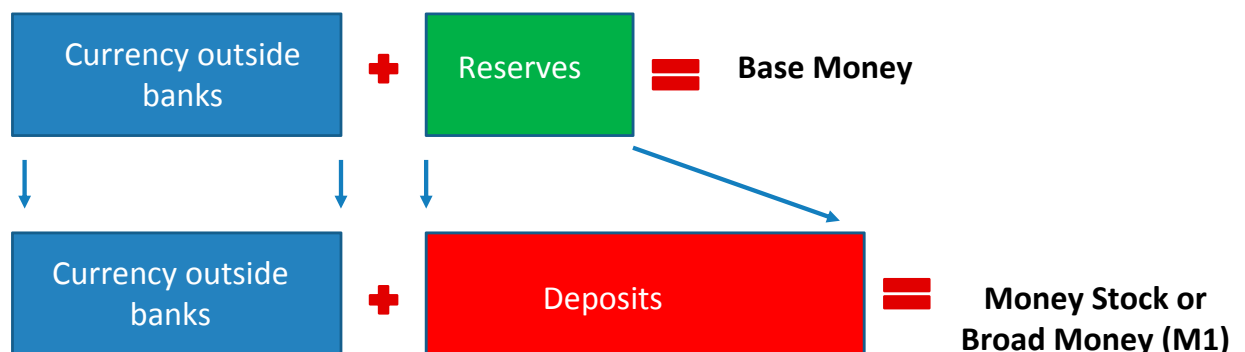
Rapid broad money growth can pose risks because:

- Indicative of rapid demand expansion that can turn inflationary.
- Broad money growth is often driven by rapid credit expansion, which could lead to a buildup of risks in financial sector.
- Large foreign liabilities, possibly arising from commercial bank borrowing abroad, can put external sustainability at risk.

Commercial Banks Credit to the Economy: Private and State Owned Enterprises (Percent of GDP)



# Money Supply and the Multiplier



# Money Multiplier

The extent of endogenous money creation can be analyzed via the money multiplier, which links broad money (M2) to reserve money (RM):

$$M2 = m \cdot RM \quad \longrightarrow \quad m = \frac{M2}{RM}$$

$$m = \frac{M2}{RM} = \frac{C+D}{C+R} = \frac{\frac{C}{D} + \frac{D}{D}}{\frac{C}{D} + \frac{R}{D}} = \frac{c+1}{c+r}$$

where  $C$  = currency in circulation,  $R$  = reserves held at CB (commercial bank deposits at CB), and  $D$  = deposits of private sector with commercial banks).

The money multiplier is a function of

- $c$  = currency-to-deposits ratio (behavioral variable)
- $r$  = reserve-to-deposits ratio (policy variable)