External balance assessment:
Balance of payments

Macroeconomic Analysis Course

Prepared for Capital Alliance, Sri Lanka

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Macroeconomic assessment roadmap

Objectives

- Understand why central banks monitor balance of payments
- Understand where the monitoring sits in terms of overall macroeconomic assessment
- Strengthen essential skills for experts monitoring these sectors
- Learn basic tools for monitoring the balance of payments

Outline

1. Setting the scene
2. Key data
3. Key economic concepts
4. Key measurement techniques

Setting the scene

Why do central banks employ experts to monitor balance of payments developments?

What information are the sector experts expected to provide to policymakers?

What signals should they look for in the data?

Why do central banks employ experts to monitor balance of payments developments?

- Open economies are naturally interconnected with the rest of the world via trade and financial flows
- For long term and short term external stability it is necessary that that the country achieves a sustainable balance in those flows
- BOP imbalances present a potential vulnerability for
  - exchange rate stability (risk of exchange rate crisis)
  - stock of foreign exchange reserves (BOP crisis)
- External balance is linked to internal balance
- Implications for monetary policy

What information are the sector experts expected to provide to policymakers?

- Current account developments: sources, trends and vulnerabilities
- Financial account developments and how they are related to financing the capital account: sources, trends and vulnerabilities
- Monitor macro-financial risks coming from trade and capital flows

What signals should they look for in the data?

- Trade flows affecting economic activity, prices and employment in the export sector

- Current account misalignment (gap)
  - pressures on exchange rates
  - pressures on foreign reserves

- Sustainability of international investment position
  - Country risk premia (credit rating)

Key data

Balance of payments and its components

Analytical accounts

International investment position and foreign reserves

Balance of payments

- The BOP summarizes:
  - during a specified period of time (flow concept)
  - with the rest of the world
  - economic transactions of an economy
- The BOP records transactions that involve:
  - change in ownership of goods and financial assets
  - provision of services, labor, and capital
- Transactions that *enter* the BOP:
  - must occur between residents and non-residents
- Transactions are recorded on accrual basis

Balance of payments (cont.)

$$CA + KA - FA = 0$$

	2018					2019				
	Q1	Q2	Q3	Q4 Est.	Annual Est.	Q1	Q2	Q3 Proj.	Q4	Annual
Current account	-586	-1,022	-389	-816	-2,814	-816	-533	-439	-592	-2,380
Balance on goods	-2,982	-2,727	-2,244	-2,390	-10,343	-2,821	-2,656	-2,621	-2,773	-10,871
Credit (exports)	2,989	2,743	3,166	2,992	11,890	3,196	2,939	3,166	3,265	12,566
Debit (imports)	-5,971	-5,470	-5,410	-5,382	-22,233	-6,017	-5,596	-5,787	-6,038	-23,437
Non-oil imports	-4,896	-4,452	-4,339	-4,395	-18,081	-5,122	-4,631	-5,045	-5,232	-20,030
Oil imports	-1,075	-1,018	-1,072	-987	-4,152	-895	-964	-742	-806	-3,407
Balance on services	1,175	719	953	919	3,766	1,060	844	1,075	1,035	4,013
Credit (exports)	2,360	1,888	2,100	2,027	8,375	2,208	2,005	2,202	2,253	8,668
Debit (imports)	-1,185	-1,169	-1,147	-1,108	-4,609	-1,148	-1,161	-1,128	-1,218	-4,655
Primary income, net 1/	-547	-445	-539	-868	-2,399	-628	-421	-606	-705	-2,360
Secondary income, net 2/	1,768	1,431	1,441	1,523	6,163	1,573	1,701	1,712	1,851	6,838
Capital account (+ surplus / - deficit)	6	4	4	0	14	5	5	5	5	20
Balance from current account and capital account	-580	-1,018	-385	-816	-2,799	-811	-528	-434	-587	-2,360
Financial account (+ net lending / - net borrowing) 3/	-50	-2,570	1,086	-378	-1,912	-1,420	-1,786	-242	-88	-3,536
Direct investments	-214	-892	-101	-334	-1,541	-221	-924	-105	-705	-1,956
Portfolio investments	-90	-1,884	1,083	762	-129	-1,136	-1,210	91	214	-2,042
Debt instruments	26	-1,850	1,067	623	-134	-1,281	-1,285	40	35	-2,491
Of which: general government	26	-2,350	317	523	-1,484	-1,281	-1,485	-10	-15	-2,791
T-bills, T-bonds, and SLDBs	26	150	317	523	1,016	118	15	-10	-15	108
Sovereign bonds	0	-2,500	0	0	-2,500	-1,399	-1,500	0	0	-2,899
Other investments 4/	254	206	104	-806	-242	-63	348	-228	403	461
Of which: Currency and deposits	-397	370	288	453	714	220	-300	40	440	400
Central bank	0	1	0	0	1	0	-400	0	400	0
Loans 4/	353	222	-426	-1,338	-1,189	-154	1,075	-780	-144	-3
Central bank 4/	0	0	0	0	0	0	0	0	0	0
Deposit taking corporations	251	-46	-483	-418	-696	-496	386	139	-100	-70
General government	54	289	71	-846	-432	443	635	-928	-53	97
Disbursements	-65	-119	-119	-1,119	-1,420	17	-135	-1,225	-350	-1,693
Amortizations	430	680	452	354	1,917	426	770	297	297	1,790
Other sectors	48	-21	-14	-74	-61	-101	54	9	9	-30
Errors and omissions	-234	143	-632	193	-529	0	0	0	0	0
Overall balance (- = need of inflow) 3/	-764	1,696	-2,103	-245	-1,416	610	1,258	-192	-499	1,176

Balance of payments (cont.)

Real transactions

Current Account

a. Balance of Goods
   - Exports
   - Imports
b. Balance of Services
   - Transportation
   - Travel
   - Other services
c. Primary Income
   - Compensation of employees
   - Investment income
d. Secondary income (transfers)
   - General government
   - Other sectors

Financial transactions

Capital Account

Financial Account

a. Direct investments
b. Portfolio investments
c. Other investment
   - Trade credit
   - Loans
   - Currency and deposits
   - Other assets
d. Reserve assets

Net errors and omissions

Analytical accounts

a. Current account
b. Capital account
c. Financial account
    - Direct investments
    - Portfolio investments
    - Other investments
d. Errors and omissions
e. Overall balance

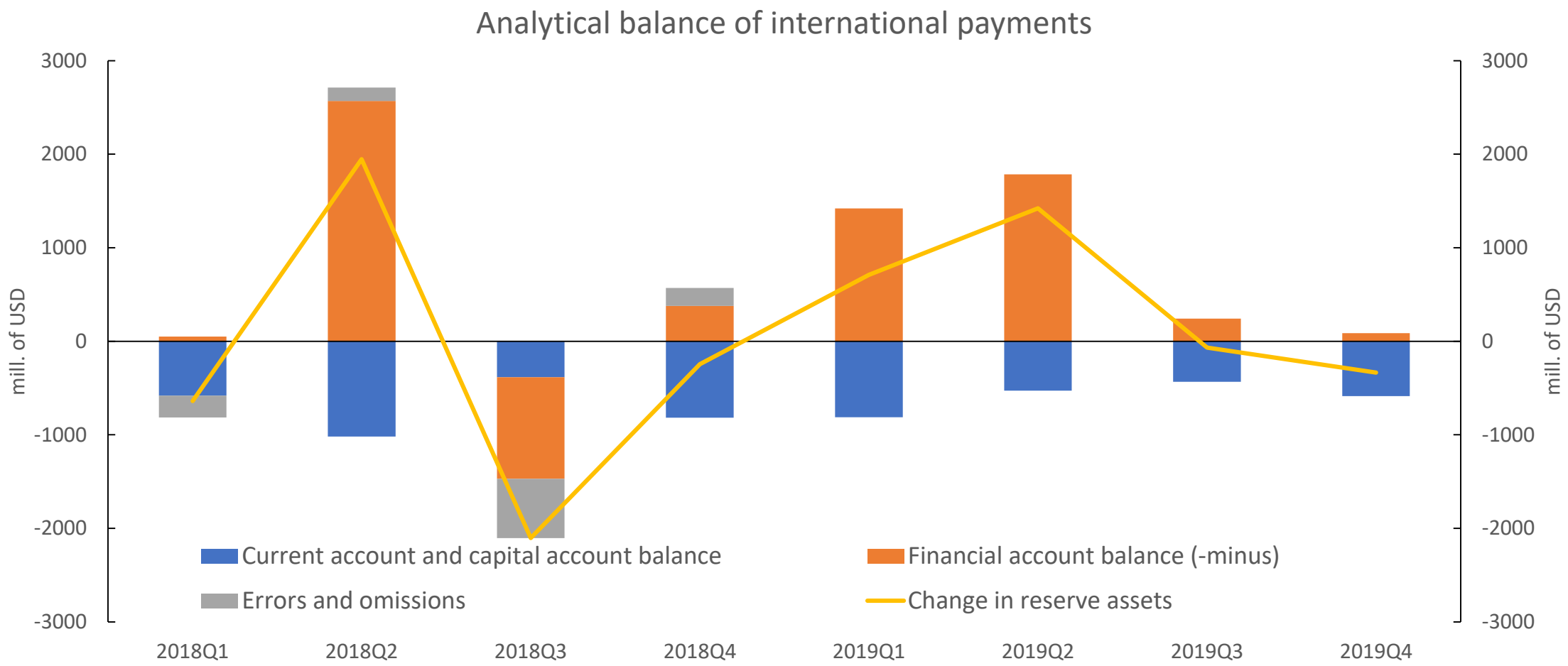
Total Financing

- Reserves assets
- IMF credit and loans
- Exceptional Financing
    - Change in arrears
    - Forgiveness of obligation of current period

International investment position

- It records the stock of assets and liabilities:
  - outstanding at the end of the recording period
  - at value prevailing at the end of the recording period
- The IIP also records *valuation changes*, that is changes in value originating from movements in prices or exchange rates.
- It is linked to the balance of the financial account.

Foreign reserves accumulation is linked to the balance of payments



Source: CBSL, IMF Country report 19/135

Note: Values for 2019 are IMF's staff projections.

Stock of international reserves (in millions of USD if not otherwise stated)

	2018					2019				
	Q1	Q2	Q3	Q4 Est.	Annual Est.	Q1	Q2	Q3 Proj.	Q4	Annual
Gross official reserves	7,320	9,267	7,164	6,919	6,919	7,629	9,052	8,985	8,650	8,650
In months of prospective imports of goods and services	3.1	4.0	3.1	3.0	3.0	3.1	3.7	3.7	3.5	3.5
In percent of ARA composite metric	59.6	75.5	58.4	56.4	56.4	60.1	71.3	70.8	68.2	68.2
Net international reserves	6,286	7,746	5,948	5,495	5,495	6,407	6,972	7,201	6,888	6,888
In percent of ARA composite metric	51.2	63.1	48.5	44.8	44.8	50.5	55.0	56.8	54.3	54.3

Source: CBSL, IMF Country report 19/135
Note: Values for 2019 are IMF's staff projections.

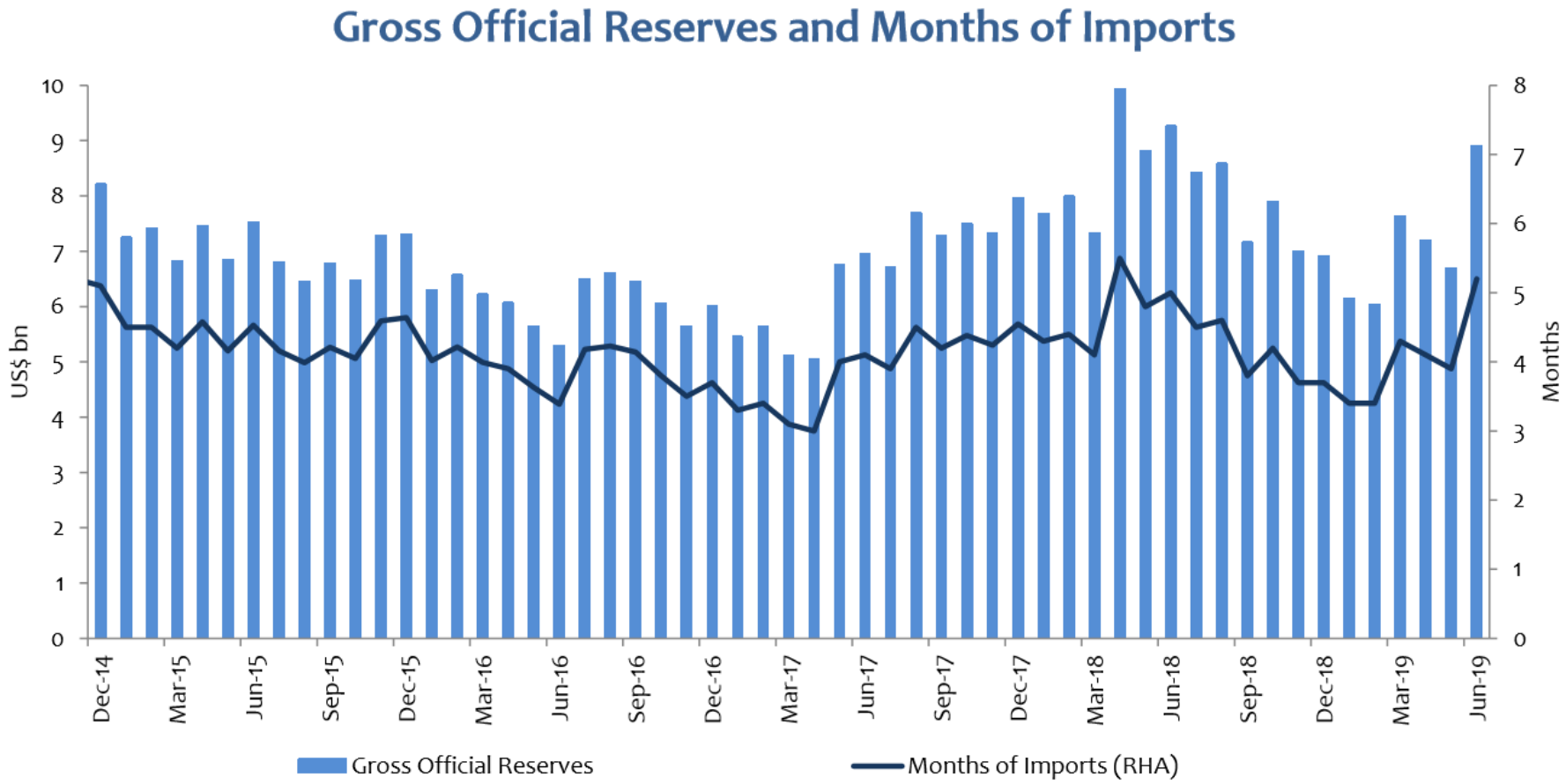
Under the IMF program the government and CBSL has committed to specific performance criteria

Table 1. Sri Lanka: Quantitative Performance Criteria (PC) and Indicative Targets (IT)

(Cumulative from the beginning of the year, unless otherwise noted)

	2018												2019			2020
	end-Jun.				end-Sep. (IT)				end-Dec. 6/				end-Jun.	end-Sep.(IT)	end-Dec.	end-Mar.(IT)
	Prog.	Adj. Prog	Act.	Met / not met	Prog.	Adj. Prog	Act.	Met / not met	Prog.	Adj. Prog	Act.	Met / not met	Prog.	Prog.	Prog.	Prog.
Quantitative performance criteria																
Central government primary balance (floor, in billion rupees)	45	45	46	Met	90	90	70	Not Met	141	141	91	Not Met	75	146	228	43
Program net official international reserves (Program NIR, floor, in million US$) 1/ 2/	1,133	2,427	1,799	Not Met	2,098	1,493	231	Not Met	1,771	2,072	-320	Not Met	1,352	1,881	1,568	106
Continuous performance criteria (cumulative from beginning of the program)																
New external payment arrears by the nonfinancial public sector and the CBSL (ceiling, in million US$)	0	0	0	Met	0	0	0	Met	0	0	0	Met	0	0	0	0
Monetary policy consultation clause																
Year-on-year inflation in Colombo Consumers Price Index (in percent) 3/																
Outer band (upper limit)	7.7	7.7	...		8.1	8.1	...		7.8	7.8	...		7.6	7.7	7.8	7.8
Inner band (upper limit)	6.2	6.2	...	Within	6.6	6.6	...	Within	6.3	6.3	...	Outside	6.1	6.2	6.3	6.3
Actual / Center point	4.7	4.7	4.1	inner	5.1	5.1	5.2	inner	4.8	4.8	3.1	inner	4.6	4.7	4.8	4.8
Inner band (lower limit)	3.2	3.2	...	band	3.6	3.6	...	band	3.3	3.3	...	band	3.1	3.2	3.3	3.3
Outer band (lower limit)	1.7	1.7	...		2.1	2.1	...		1.8	1.8	...		1.6	1.7	1.8	1.8

Did the CBSL meet the June-2019 criteria for the stock of forex?



Key economic concepts

External and internal balance

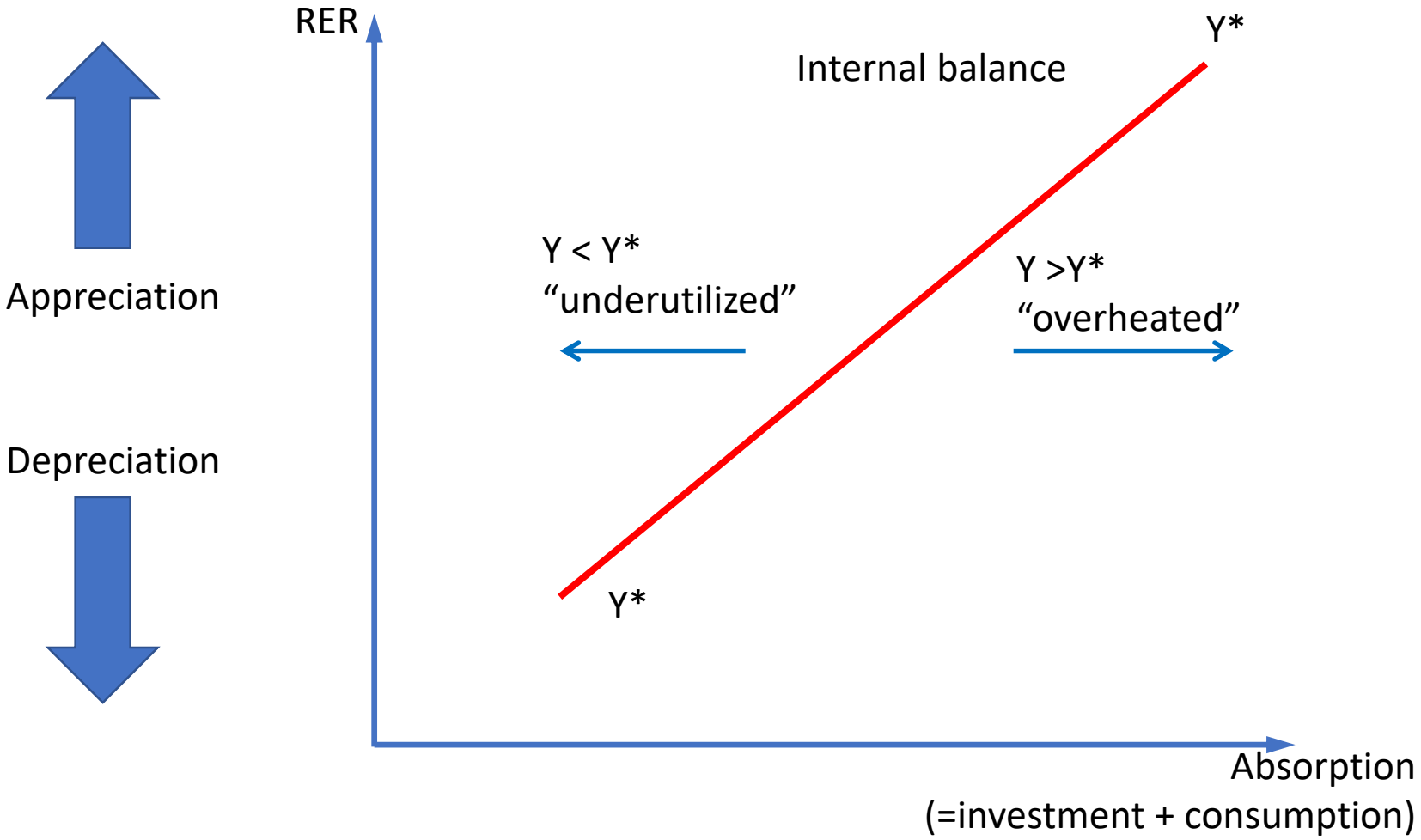
BOP, current account, and links to the national accounts and internal balance

External and internal balance

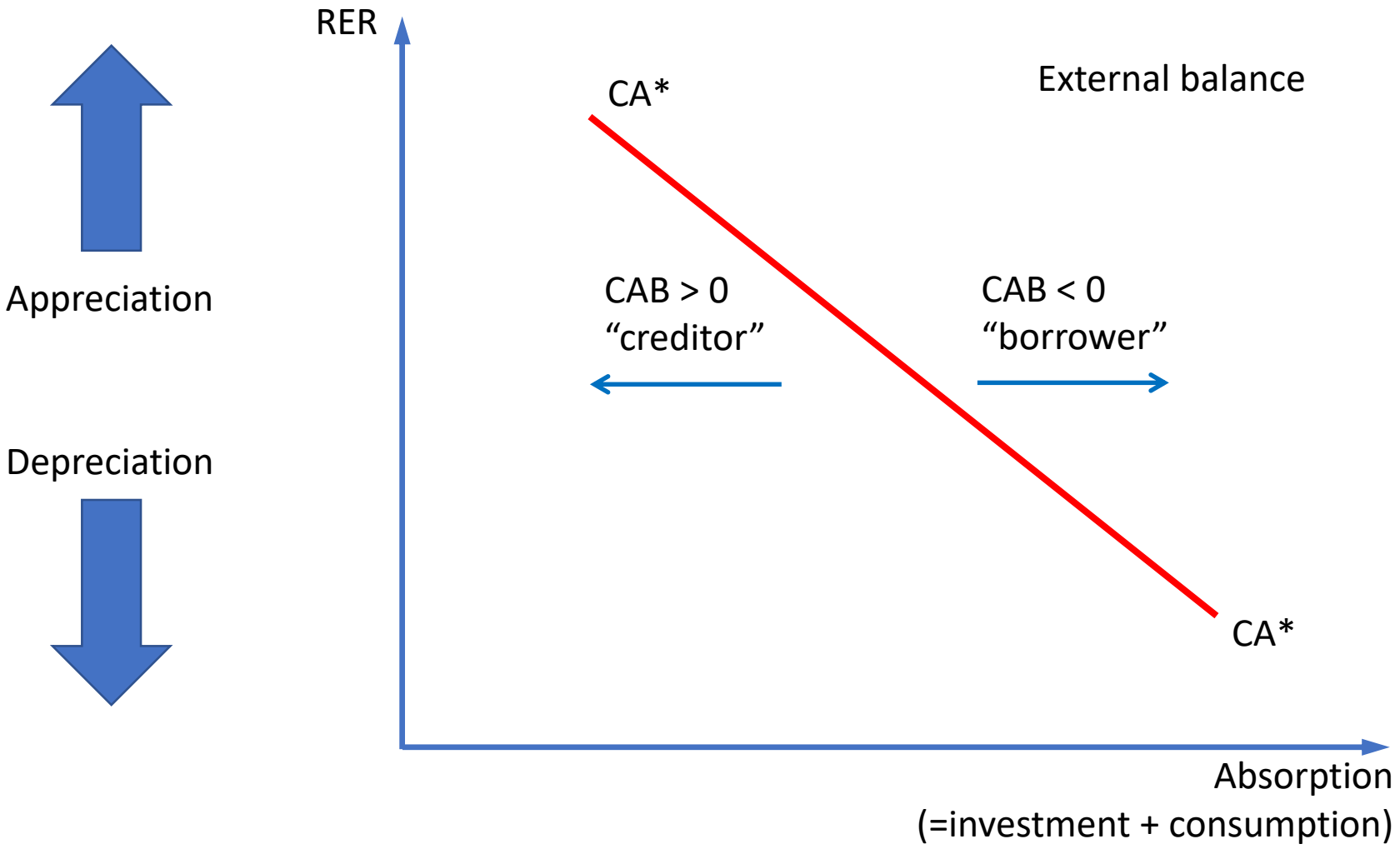
- ***Internal balance:*** output at its potential, stable inflation (at desirable level)

- ***External balance***: current account is financed with a sustainable level of capital flows

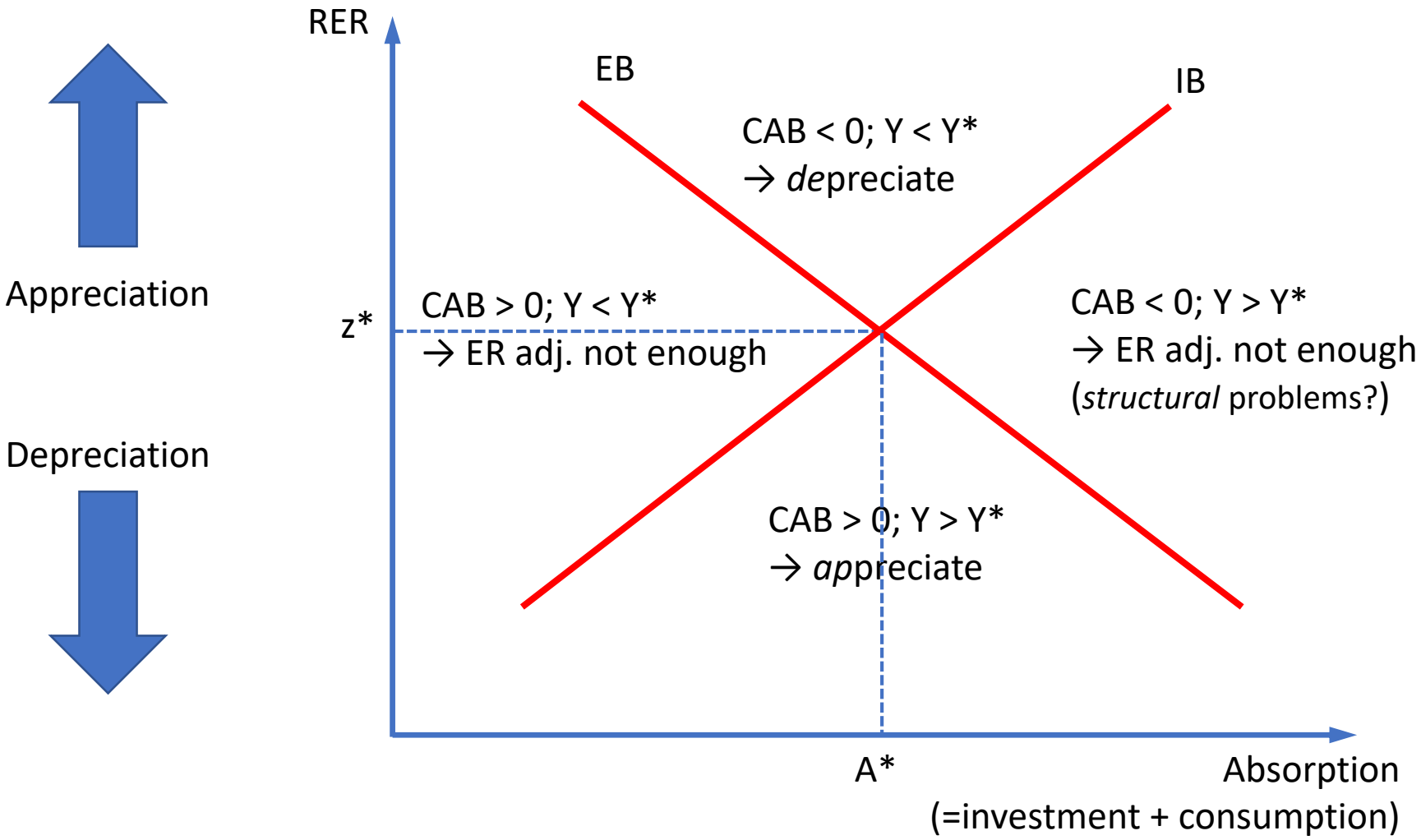
Internal balance



External balance



Internal and external balance



Balance of payments and national accounts

From the expenditure approach of the National Account we know that the **Gross Domestic Output** (GDP) is

$$GDP = C + G + I + X - M$$

where C is private consumption, G is government consumption, X denotes exports and M imports.

By adding the balance of the primary income (BPI) and the balance of the secondary income (BSI) to the GDP we obtain the **Gross National Disposable Income**

$$GNDY = GDP + BPI + BSI$$

Balance of payments and national accounts (cont.)

Link between the National Accounts and the Balance of Payments

$$GNDY = C + G + I + X - M + BPI + BSI$$

$$GNDY - (C + G) - I = X - M + BPI + BSI = CAB$$

$$S - I = X - M + BPI + BSI = CAB$$

where CAB is the current account balance, $S = GNDY - C - G$ is domestic saving.

Balance of payments and national accounts (cont.)

The relation CAB = S - I has several implications:

1. The current account balance is the gap between investment and domestic saving.
   - Hence policies that aim to affect the CAB should necessarily affect saving and/or investment decisions.

2. Understanding the sources of the CA deficit is crucial because its long run impact on the external position of the economy is different depending on the factors creating the deficit.
   - $CA < 0 \Leftrightarrow$ reduction of S relative to I or to due to an increase of I relative to S

Balance of payments and national accounts

- The interrelation of CAB with investment and saving can be seen in more detail by distinguishing between private and government sector.

$$S\text{-}I = Sp + Sg - Ip - Ig$$

- Sp is private saving, Sg is public saving, Ip private investment and Ig government investment.

$$CAB = (Sp - Ip) + (Sg\text{-}Ig)$$

- if the government sector deficit is not compensated by excess savings in the private sector, then CAB will be in deficit.
    - Hence, a sustained deficit in the government sector may be reflected as a deficit in current account balance (**Twin deficits**).

Key measurement techniques

External sustainability assessment

Sustainable level of current account deficits

External balance methodology based on IMF's CGER

- *Consultative Group on Exchange Rate* issues from 1997
- 3 complementary methodologies:
  - Macroeconomic balance approach
    - Difference btw. the CA balance projected for the medium term and the "CA norm"
    - Exchange rate adjustment to eliminate this difference
  - Equilibrium real exchange rate approach
    - Equilibrium RER is a function of medium-term fundamentals
    - Difference (adjustment) btw. the equilibrium RER and its current value
  - External sustainability approach
    - The difference btw. the actual CAB and the CAB that stabilizes NFA at a benchmark
    - RER adjustment to close the difference

Macroeconomic balance approach

- **Step 1.** Panel regression to estimate **equilibrium relationship** of CAB and fundamentals
- **Step 2.** For each country, compute the **CA norm** using step 1 coefficients and fundamentals that **should** prevail in the medium term
  - so, the norm is understood as a mid-term equilibrium or sustainable level
- **Step 3.** Project the **underlying CA** that **is likely** to take place in the medium run under the assumptions that:
  - all lagged exchange rate effects play out
  - REER remains unchanged
  - output gaps in all countries close (internal balance)
- **Step 4.** Compute **REER adjustment** that would **close the gap** between the **CA norm and the "underlying" CA balance**

MB Approach: implementation

- **Step 1.** $$CA_{i,t} = \beta_0 + \boldsymbol{\beta}_1' \mathbf{X}_{i,t} + \varepsilon_{i,t}, \quad \varepsilon_{i,t} \sim N(0, \sigma_i^2)$$

  i =1,…,182 countries; t = 1973..2009

  $CA_{i,t}$ is the current account to GDP ratio, country i at time t

- **Step 2.**

$$CA_i^{norm} = \hat{\beta}_0 + \hat{\boldsymbol{\beta}}_1' \hat{\mathbf{X}}_{i,T+H}$$

where $\hat{\beta}_0, \hat{\boldsymbol{\beta}}_1$ - parameter estimates of step 1 regression

$\hat{\mathbf{X}}_{i,T+H}$ - set of medium-term ("equilibrium") values of macro fundamentals

H = 5y – medium-term horizon

CA determinants in panel regression

- **Fiscal balance** (ratio of the budget balance to GDP relative to average budget balance of trading partners)
- **Demographics** (old age dependency ratio and the population growth, relative to trading-partners average)
- **Net foreign assets** (an "initial" NFA position before the period of reference for the current account balance)
- **Oil balance** (the oil balance as a ratio to GDP)
- **Economic growth** (the ratio of PPP-based per-capita income to the U.S. level and real per-capita GDP growth rate relative to its trading-partner average)
- **Crises** (indicator of banking crisis episodes)
- **Financial center** (dummy)

Table 1. Macroeconomic Balance Approach: Current Account Regressions

	Pooled Estimation	Hybrid Pooled Estimation	Fixed Effects Estimation
Fiscal balance	0.20***	0.19***	0.32***
Old-age dependency	–0.14**	–0.12**	–0.23**
Population growth	–1.21***	–1.03**	–0.47
Initial net foreign assets (NFA)	0.02***	...	...
Lagged current account	...	0.37***	...
Oil balance	0.23***	0.17***	0.31***
Output growth	–0.21**	–0.16*	–0.27
Relative income	0.02*	0.02*	...
Banking crisis	0.01*	0.01	...
Asian crisis	0.06***	0.04***	0.07***
Financial center	0.03***	0.03***	...
Adjusted R^2	0.52	0.62	0.56

Note: The regression specification in the second column (hybrid pooled estimation) also includes a few country-specific constant terms (see Appendix 2.1 for details). *, **, and *** indicate significance at the 10, 5, and 1 percent level, respectively, based on standard errors robust to serial correlation.

Source: Lee et al (2008)

MBA: coefficient signs

- Fiscal balance: a surplus ↑ national saving → ↑ CAB
- Demographics: pensioners do not save → ↓CAB
- NFA: countries with high NFA
    1. can run deficits on an extended basis [-ve sign];
    2. Or have higher foreign investment income (part of the CA). This second effect is stronger [+ve sign]
- Oil balance: higher oil prices →
    - ↑ Oil balance (and ↑ CAB) of exporters
    - ↑ Oil balance (and ↓ CAB) of importers

MBA: coefficients signs (cont.)

- Economic growth: faster economic growth relative to trading partners → ↓ CAB [-ve]
- Relative income: less developed countries (lower income) need to invest → financed through external borrowing and CAB deficit [+ve]
- Economic crises: CAB ↑ with macroeconomic contraction and/or reduced international financing [+ve]
- Financial center: financial hubs tend to run CA surpluses [+ve]

MBA: Implementation (2)

- **Step 3.**
  - For a country assume a model relating trade flows with $REER_t$ and domestic Y_t and foreign output gaps Y_t^*

$$X_t = f(Y_t, REER_t, ..., REER_{t-h})$$

$$M_t = f(Y_t^*, REER_t, ..., REER_{t-h})$$

  - Forecast: output gaps close and the REER remains at the time *t* level

$$X_t = f(\bar{Y}_t, REER_t, ..., REER_t)$$

$$M_t = f(\bar{Y}_t^*, REER_t, ..., REER_t)$$

  - assume that the **underlying CA** is driven only by trade flows and then it is

$$CA_{t+h}^U = \hat{x}_{t+h} - \hat{m}_{t+h}$$

    - lower case *x* and *m* indicate percentage of GDP

MBA: Implementation (3)

- **Step 4.**
  - Input: Medium-run semi-elasticity of $CA_{i,t}$ w.r.t. REER:

$$\eta_{CA,i} = x_i \eta_X - m_i (\eta_M - 1)$$

x_i and m_i are the shares of exports and imports in country *i*'s GDP, projected in period *T+h*

η_X and η_M are medium-run elasticities (same across all *i*) of the volumes of exports and imports, respectively, w.r.t. RER

  - The ER misalignment (required adjustment):

$$REER\,\text{gap}_{i,t} = \frac{1}{\eta_{CA,i}} \left(CA^{U}_{i,t+h} - CA^{norm}_{i,t+h} \right)$$

  - Note: can also restore the implied Equilibrium REER:

$$\ln REER^{E}_{i} = \ln REER_{i,t} - REER\,\text{gap}_{i,t}$$

MBA: Illustrative results

Table 2. Macroeconomic Balance Approach: Illustrative Current Account Norms
(In percent of GDP)

Country	Current Account[1] Observed 2006	Current Account[1] Medium term 2012	Current Account Norm[2]
Advanced countries			
Europe	0.3	–0.2	0.3
Other	–3.4	–3.3	–1.9
Emerging markets			
Asia	6.3	7.3	1.3
Latin America	1.8	–0.8	–0.3
Central and Eastern European countries	–3.8	–3.9	–2.8
Other	3.7	–0.2	1.1

[1]Based on the September 2007 World Economic Outlook database.
[2]Calculated from hybrid pooled estimates.

Source: Lee et al (2008)

External sustainability approach

- **Step 1.** Calculate the CA balance stabilizing the NFA at a benchmark level (an "equilibrium level")

- **Step** 2. Use this CA balance and the elasticities as in MB approach to generate the REER adjustment…

  - that – over the medium term – would bring the "underlying" CA balance in line with the NFA-stabilizing CA balance

ESA: Implementation

- BoP Identity (assuming no fin. flows): $NFA_{i,t} - NFA_{i,t-1} = CA_{i,t}$
- Ratios to GDP: $$\frac{NFA_{i,t}}{Y_{i,t}} - \frac{NFA_{i,t-1}}{Y_{i,t-1}}\left(\frac{1}{Y_{i,t}/Y_{i,t-1}}\right) = \frac{CA_{i,t}}{Y_{i,t}}$$
- Rewrite: $$ca_{i,t} = nfa_{i,t} - \frac{1}{1+g_i} nfa_{i,t-1}$$

g_i is the medium-term growth rate of nominal GDP (same currency as is CA)

- Keep $nfa_{i,t}$ stable at $\overline{nfa_i}$. The required (norm) CA:

$$\overline{ca_{i,t}} = \overline{nfa_i}\left(1 - \frac{1}{1+g_i}\right) = \frac{g_i}{1+g_i}\overline{nfa_i} =: ca_i^{norm}$$

- Given ca_i^{norm}, apply trade elasticities (η_X and η_M) to calculate REER gap (Step 3 in MB approach)

ESA: Illustrative results

Table 4. External Sustainability: Current Account Stabilizing NFA at 2006 Level
(In percent of GDP)

	NFA 2006	Current Account: Medium term 2012	Current Account: Stabilizing NFA at 2006 level
Advanced countries			
Europe	–9.6	–0.2	–0.5
Other	–7.6	–3.3	–0.5
Emerging markets			
Asia	21.2	7.3	1.7
Latin America	–28.6	–0.8	–1.6
Central and Eastern European countries	–49.1	–3.9	–3.1
Other countries	–13.9	–0.2	–0.9

Sources: Lane and Milesi-Ferretti (2007b); net foreign assets database; IMF, *World Economic Outlook* (October 2007); and IMF staff estimates.

Source: Lee et al (2008)

Conclusion

Main takeaways

- National Accounts, Balance of Payments and International Investment Position are interlinked
- Exchange rate adjustments are the key mechanism for achieving external and internal balance in open economies
- Current account gap measures the degree of external misalignment
- Central banks monitor BOP to identify risks to the sustainability of the country's net foreign asset position, and future pressures on exchange rates