A Macroeconomic Perspective on the Real Sector: Growth, Economic Fluctuations and Inflation

**Workshop for Staff of
Ministry of National Planning and Economic Development
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Outline

I.   **Real Sector Overview**

II. Measuring and Analyzing GDP

III. Sources of Growth

IV. Inflation

V.   Forecasting GDP

Real Sector Overview

| Table 1. Myanmar: Selected Economic Indicators, 2009/10–2013/14 1/					
	2009/10	2010/11	2011/12	2012/13 Est.	2013/14 Proj.
Output and prices			(Percent change)		
Real GDP (authorities)	10.6	10.4	5.9	6.7	...
Real GDP (staff working estimates)	5.1	5.3	5.9	6.4	6.8
CPI (end-period)	7.7	8.9	-1.1	4.7	6.5
CPI (period average)	2.2	8.2	2.8	2.8	5.6
Memorandum items					
GDP (billions of kyats) 4/	34,958	39,847	43,368	47,433	53,501
GDP (billions of US$)	38.1	49.6	56.2	55.3	59.4
GDP per capita (US$)	587	742	900	868	915

Real Sector Overview

What is the real sector about?

At one level, it is about

- Level of production in the economy

This means it is also about

- Employment

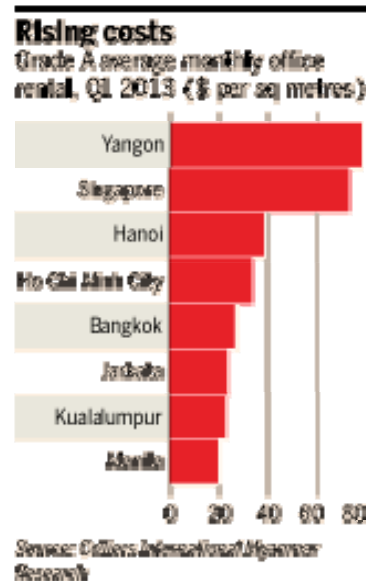- Investment

- Income

- Consumption
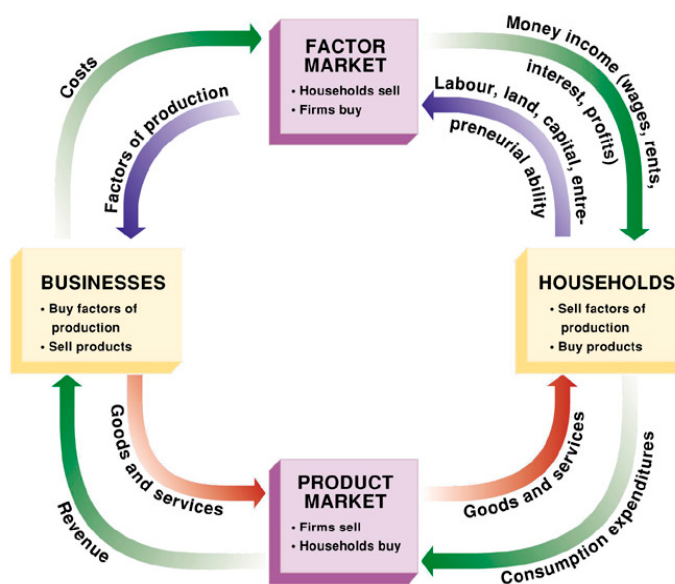
Real Sector Overview

What is the real sector about?

At another level, it is about prices such as

- Consumer prices

- Input prices

- Wages

In a market economy, prices clear markets which in turn determines production levels. We cannot separate between the two.

Rising costs
Grade A average monthly office rental, Q1 2013 ($ per sq metres)

Yangon
Singapore
Hanoi
Ho Chi Minh City
Bangkok
Jakarta
Kualalumpur
Manila

0 20 40 60 80

Source: Colliers International Myanmar Research

Real Sector Overview

How do we measure economic output?

- Should we just add up all the **(gross) output** produced by businesses and households in the economy?

- No, this would lead to double counting! Example: wheat used in production of bread

- To avoid double counting, we need to subtract intermediate inputs:
gross output - intermediate consumption = **value added**

- **Gross domestic product (GDP)**: sum of value added across all sectors in the economy

Real Sector Overview

Why is GDP so important?

- Measure of output

- Approximation of welfare

- Many other variables are moving broadly
  proportional to GDP (e.g., revenues)
  → GDP ratios
  → GDP forecast is basis for revenue forecasts etc.

- Macroeconomic management: keeping GDP roughly
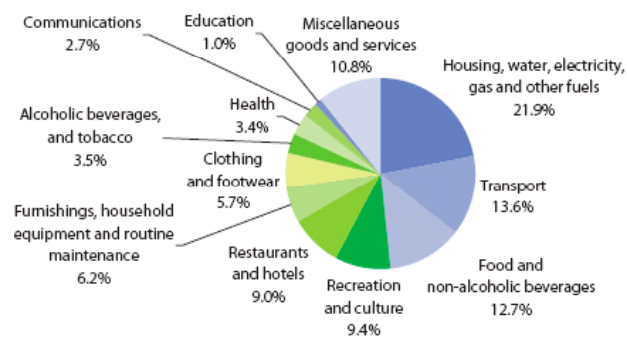 in line with its potential

Real Sector Overview

Key concepts: Consumption

We distinguish between

- Final household
consumption—e.g., food,
housing, transportation

- Final government
consumption—e.g.,
electricity, fuel, office
supplies

- Intermediate
consumption—
aforementioned inputs
into production

Communications
2.7%

Education
1.0%

Miscellaneous
goods and services
10.8%

Housing, water, electricity,
gas and other fuels
21.9%

Alcoholic beverages,
and tobacco
3.5%

Health
3.4%

Clothing
and footwear
5.7%

Transport
13.6%

Furnishings, household
equipment and routine
maintenance
6.2%

Restaurants
and hotels
9.0%

Recreation
and culture
9.4%

Food and
non-alcoholic beverages
12.7%

(1) Figures do not sum to 100 % due to rounding.
Source: Eurostat (nama_co2_c)

Real Sector Overview

Key concepts: Investment

Additions to the capital stock, e.g., purchase of machinery or construction of buildings
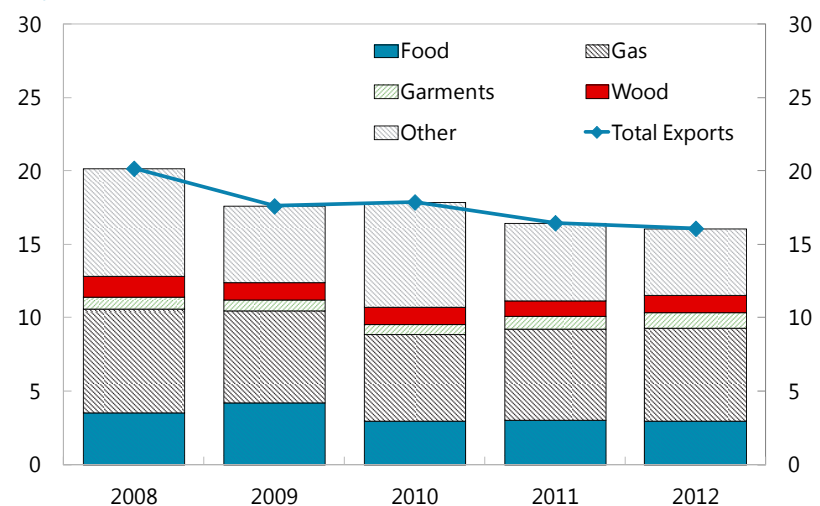
Real Sector Overview

Key concepts: Exports

What Myanmar sells abroad...

Main Exports
(In percent of GDP)

Legend: Food, Gas, Garments, Wood, Other, Total Exports

Real Sector Overview

Key concepts: Imports

What you buy
from abroad …

Real Sector Overview

Key concepts: Nominal versus Real

- *Nominal GDP:* measures the value of output of the economy at current prices

- *Real GDP:* measures the value of output of the economy -- changes in an economy's physical output -- using prices of a fixed base year

- Changes in nominal GDP over time reflect changes in both prices and physical output

Real Sector Overview

Key concepts: Distinction between nominal versus real is useful for (1) measuring purchasing power:

Example: Nominal wages ↑ 20%

↑ If inflation was 10%,

Real buying power grew

BUT

↓If inflation was 30%,

Real buying power shrank

Real Sector Overview

Key concepts: Distinction between nominal versus real is useful for (2) accounting for different GDP factors:

Value (V) = Price (P) * Quantity (Q)

Nominal GDP (V) = GDP Deflator (P) * Real GDP (Q)

Fundamental relation to be used over & over !

- Approximation: $\Delta\%V \approx \Delta\%P + \Delta\%Q$

- Exact relationship:

$(1+ \Delta\%V/100) = (1+\Delta\%P/100)*(1+\Delta\%Q/100)$

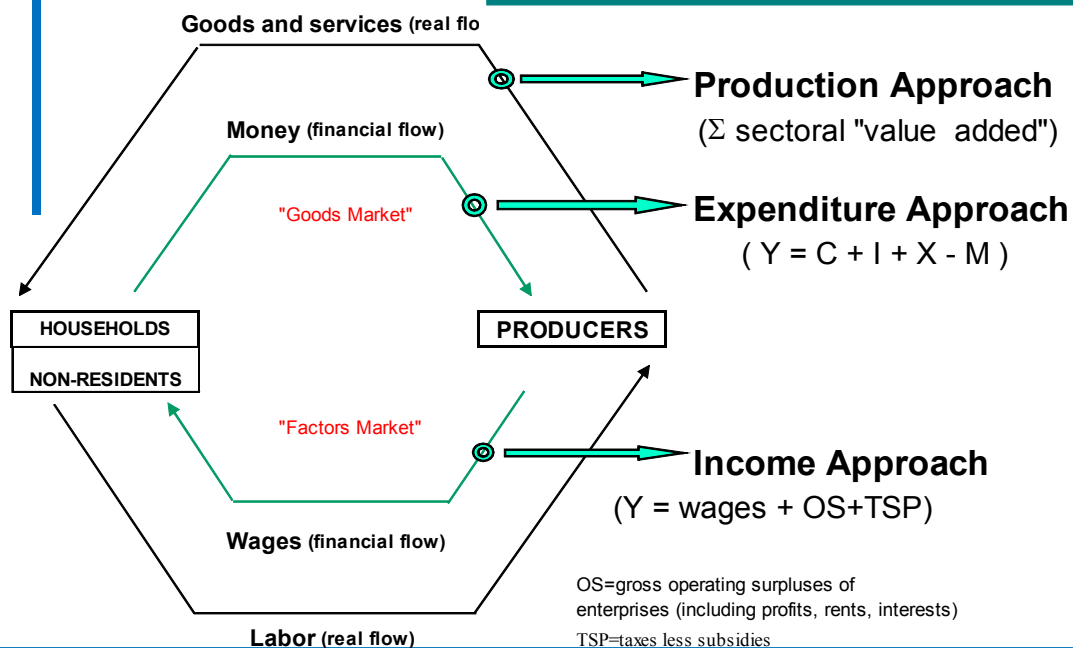# Outline

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Measuring and Analyzing GDP

Estimate of GDP

Goods and services (real flo

Production Approach
(Σ sectoral "value added")

Money (financial flow)

"Goods Market"

Expenditure Approach
(Y = C + I + X - M)

| HOUSEHOLDS |
| NON-RESIDENTS |

PRODUCERS

"Factors Market"

Income Approach
(Y = wages + OS+TSP)

Wages (financial flow)

OS=gross operating surpluses of
enterprises (including profits, rents, interests)

Labor (real flow)   TSP=taxes less subsidies

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Measuring and Analyzing GDP

Production approach: GDP Shares

Myanmar: Composition of GDP (Constant 2006/07 Prices)
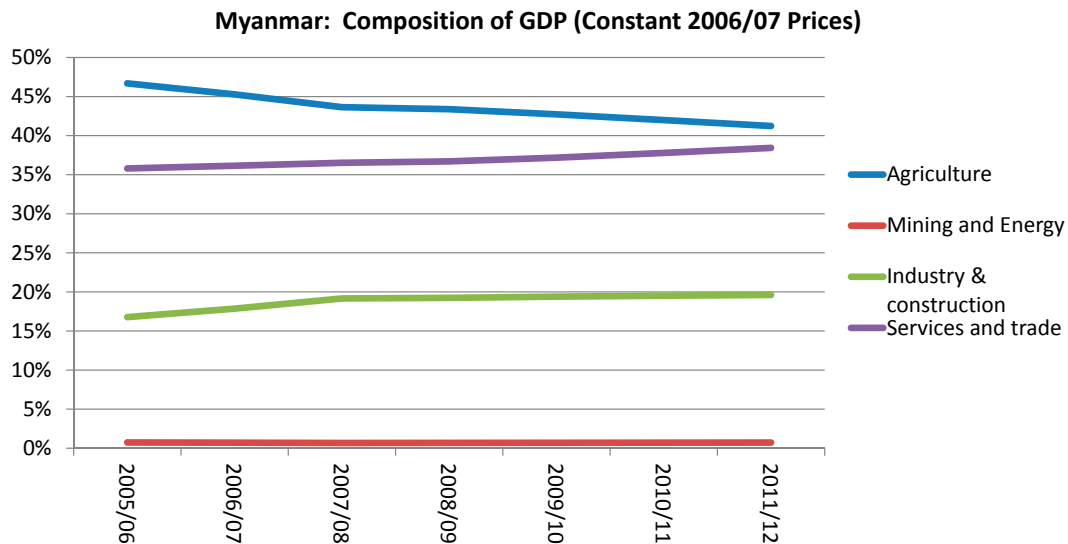
Measuring and Analyzing GDP

Production approach: real GDP growth by sector

Myanmar: GDP Growth (Constant 2006/07 Prices)
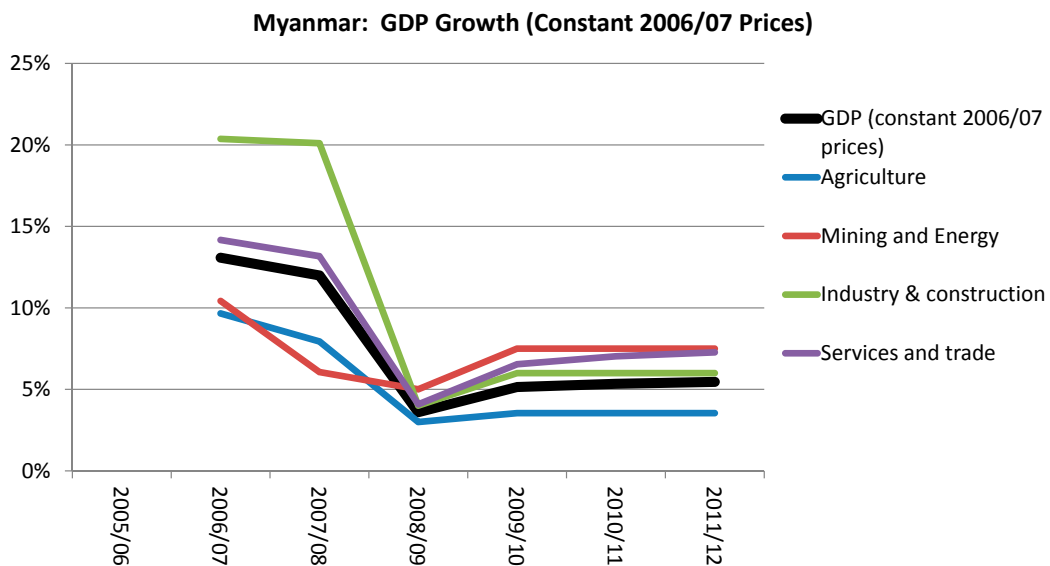
Measuring and Analyzing GDP

Production approach: growth contributions by sector

Myanmar: GDP Growth (Constant 2006/07 Prices)

Legend:
- Services and trade
- Industry & construction
- Mining and Energy
- Agriculture
- GDP (constant 2006/07 prices)
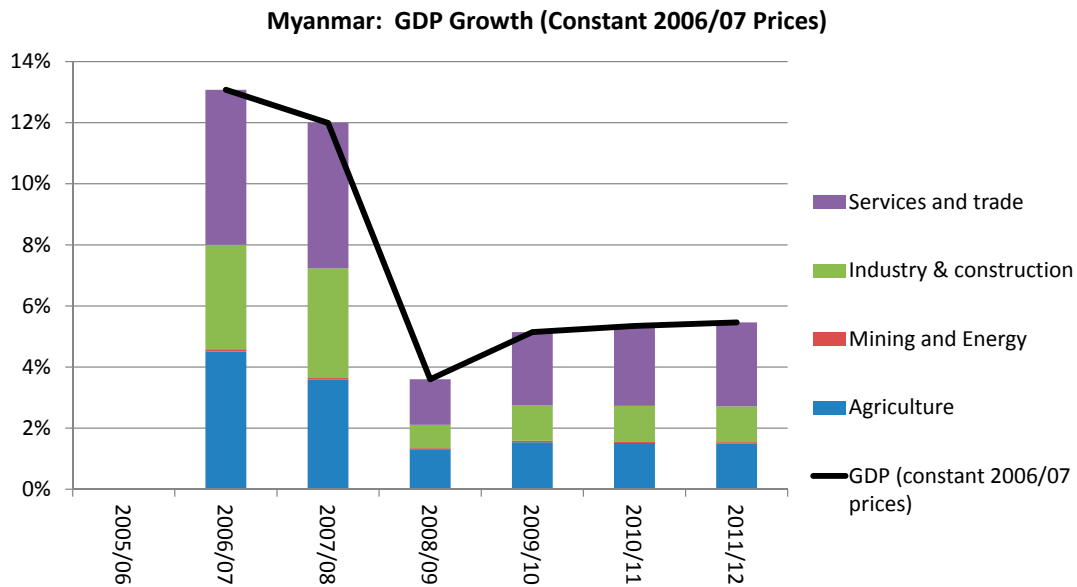
Measuring and Analyzing GDP

Expenditure approach:

- **Absorption (A) =
  Final Consumption (C) + Investment (I)**

- **Net Exports (X-M)**
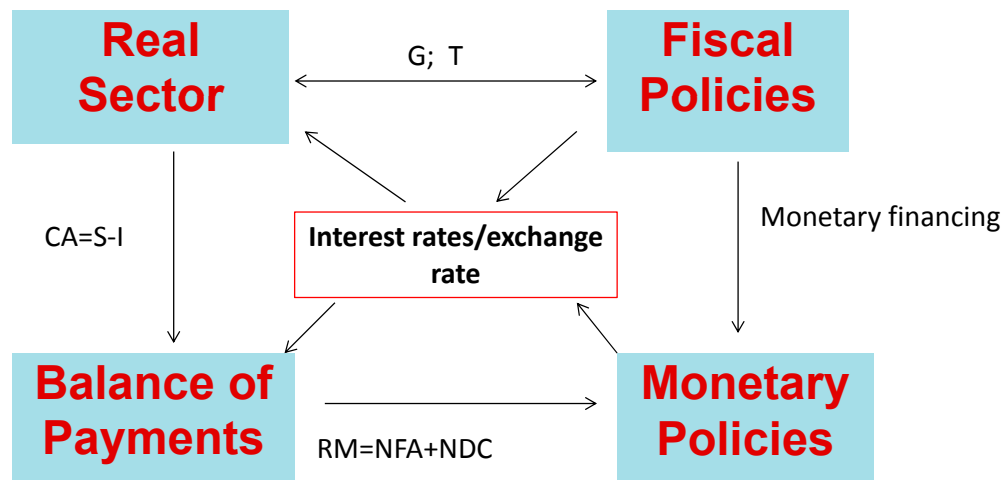   X = Exports of goods and services
    M = Imports of goods and services

➤ GDP = A   +   X – M
    Domestic Demand   Foreign Demand

Measuring and Analyzing GDP

Expenditure approach links real sector to other sectors:

Real Sector	G; T	Fiscal Policies

CA=S-I

Interest rates/exchange rate

Monetary financing

Balance of Payments	RM=NFA+NDC	Monetary Policies

Outline

I. Real Sector Overview

II. Measuring and Analyzing GDP

III. **Sources of Growth**

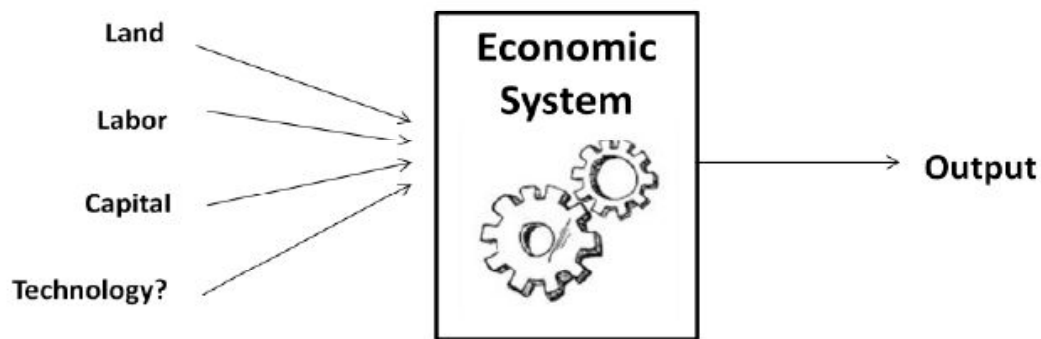IV. Inflation

V. Forecasting GDP

Sources of Growth

A simple metaphor for thinking about growth:

Economy as a machine:

Transforming inputs such as labor and capital into outputs such as goods and services.

Land

Labor

Capital

Technology?

Economic System

Output

Sources of Growth

'Economy as machine' metaphor suggests …

… for more growth we need more inputs!

But many inputs such as land, labor or education are difficult to procure in the short run, so …

… growth in the short run depends really on investment.

Is this really true?

Sources of Growth

Alternatively, we need to use our existing inputs more efficiently!

This is about …

- Technical innovation (especially in advanced countries), and …

- … adoption of best practices and existing technologies (especially in emerging and developing countries)

MORE FOOD WITH FEWER RESOURCES

300%

262%

200%

1950
(Base Year)

2008

100%

100%

100%

98%

0

INPUT

FOOD

INPUT

FOOD

*Primary inputs include labor, fertilizer, seed, crop-protecting chemicals, feed, fuel, electricity and farm services.
Source: AFBF, USDA National Resources Inventory (2007)

Sources of Growth

Growth accounting—quantifying growth factors

Growth accounting is based on production function that typically includes the following growth factors:

- Growth rate of capital, which is closely linked to a nation's investment rate
- Growth rate of 'Raw' labor, i.e., growth in labor force measured in the *number* of available workers
- Growth of human capital, i.e., growth in the *quality* of individual workers, often linked to schooling
- Technical progress, i.e., increase in efficiency of using above input factors, often called growth rate *of total factor productivity (TFP)*

Sources of Growth

Growth accounting—advanced economies

So what are typically the most important growth drivers?

For advanced economies, TFP growth is often key:

Growth Accounting for the United States, 1948-2000

	Annual Growth Rate of Y	Annual Growth Rate of Y/L	Contribution of K/L	Annual Growth Rate of A
1948-1973	4.0%	3.0%	1.2%	1.8%
1973-1995	2.7%	0.9%	0.8%	0.1%
1995-2000	4.2%	3.0%	1.1%	1.9%

$(\alpha = 0.4)$

Source: See DeLong, Growth Accounting, http://j-bradford-delong.net/macro_online/growth_accounting.pdf, p. 6

Sources of Growth

Growth accounting—transition economies

- Capital deepening was on average the single most important growth driver

- Closely followed by TFP growth

Figure 4. Sources of Growth in Transition Economies, 1996–2006 (In percentage points of GDP)
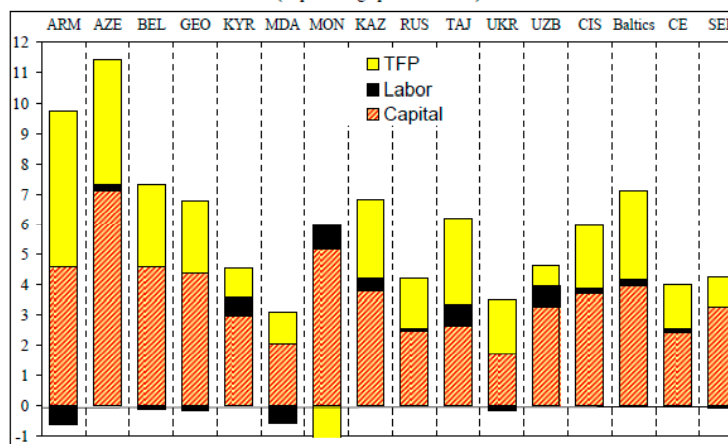
Sources: Authors' own calculations based on the IMF World Economic Outlook database.
Baltics (Estonia, Latvia, and Lithuania).
CE: Central Europe (Czech Republic, Hungary, Poland, Slovak Republic, and Slovenia).
SEE: Southeast Europe (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, and Romania).

Source: See Iradian (2007), Rapid Growth in Transition Countries: Growth-Accounting Approach, p. 16

Sources of Growth

Growth Experience in Asia

- Capital deepening was especially important in Asia, resulting from very high investment (and savings) ratios

- Human capital accumulation was another key factor in East Asia during 1966-90

Table 1-2: Educational Attainment of the Working Population (%)								
	Hong Kong		Singapore		South Korea		Taiwan	
	1966	1991	1966	1990	1966	1990	1966	1990
None	19.2	5.6	55.1	⇓	31.1	6.4	17.0	4.5
Primary	53.6	22.9	28.2	33.7	42.4	18.5	57.2	28.0
Secondary+	27.2	71.4	15.8	66.3	26.5	75.0	25.8	67.6

Notes: Self taught are included under primary. Hong Kong, Korean and Taiwanese data refer to highest level of education "attended" rather than completed. All percentages calculated net of those reported as "unknown".

Source: See Young (1994), Tyranny of Numbers, p. 3

Sources of Growth

Recent IMF Research Results on Growth Factors

World Economic and Financial Surveys

World Economic Outlook

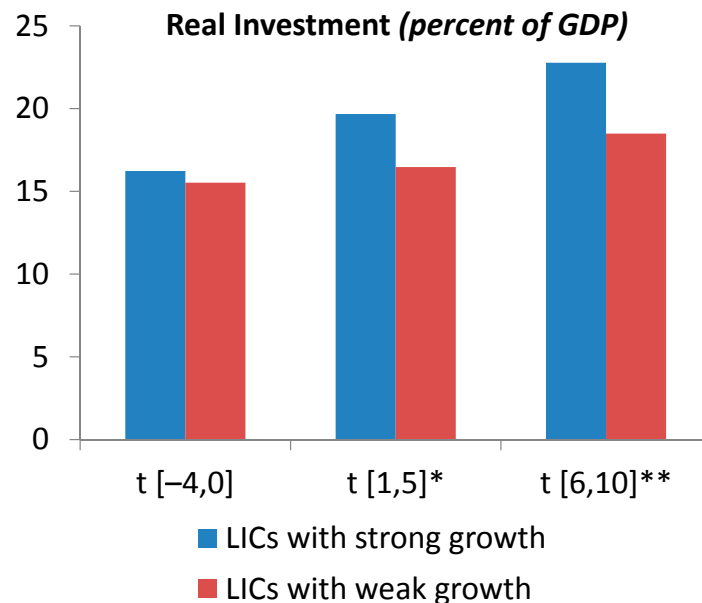Hopes, Realities, Risks

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INTERNATIONAL MONETARY FUND
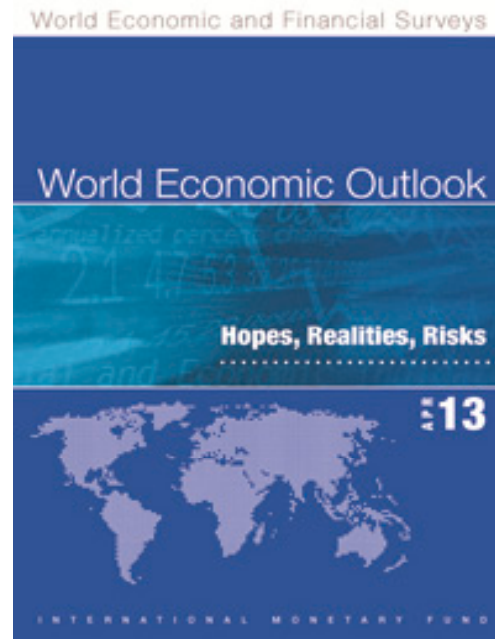
Sources of Growth

Investment is associated with higher growth …

• This is consistent with the finding from growth-accounting that capital deepening is a significant growth driver

• But notice also that the difference in investment ratios between the two groups is not very large
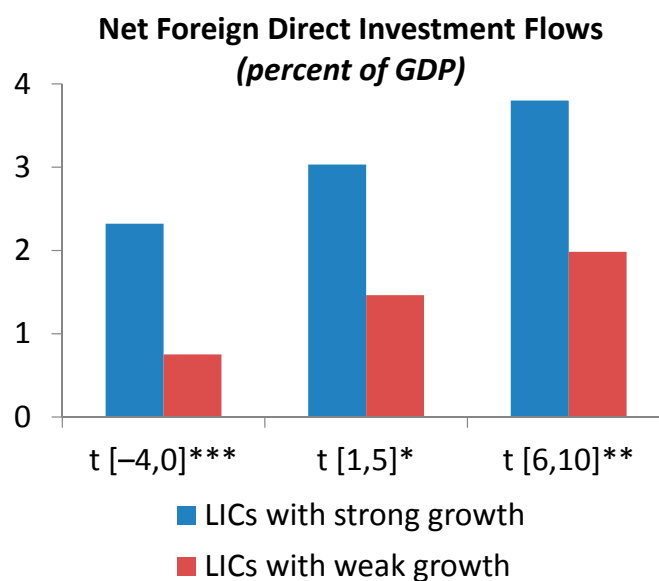
→ Investment is not the only factor that matters!

Real Investment (percent of GDP)

Categories: t [–4,0], t [1,5]*, t [6,10]**

■ LICs with strong growth
■ LICs with weak growth

Sources of Growth

… and FDI appears especially beneficial

• FDI affects growth through capital deepening, similar to general investment

• More important is probably that FDI helps to adopt best practices and new technology, boosting TFP growth

• Last channel is likely to be especially effective for manufacturing-related FDI

Net Foreign Direct Investment Flows
(percent of GDP)

Categories: t [–4,0]***, t [1,5]*, t [6,10]**

■ LICs with strong growth
■ LICs with weak growth

Sources of Growth

Growth takeoffs are associated with openness:

• Similar to FDI, trade linkages help to import new technology and adopt best practices

• Trade linkages also allow a greater degree of specialization, which also helps with efficiency and innovation

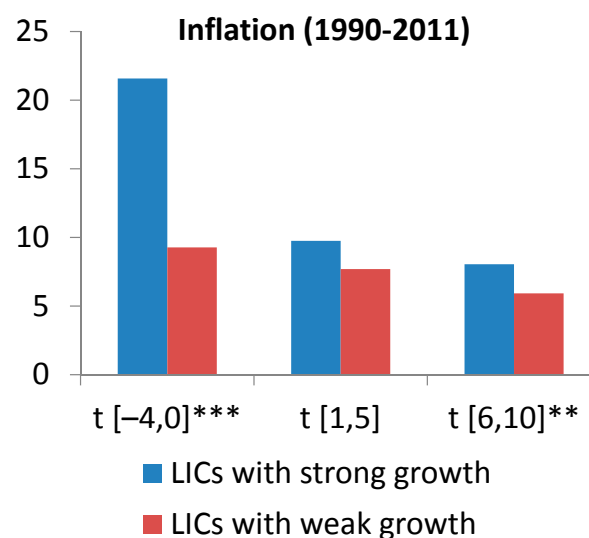→ both of these factors help boost TFP growth

Real Exports *(percent of GDP)*

■ LICs with strong growth
■ LICs with weak growth
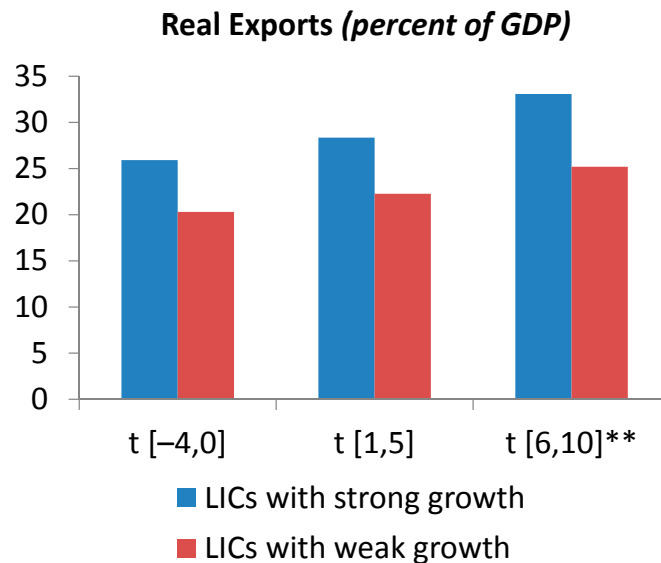
Sources of Growth

Reigning in high inflation promotes growth:

High inflation is bad for growth, so reigning in inflation helps to return growth to its normal level

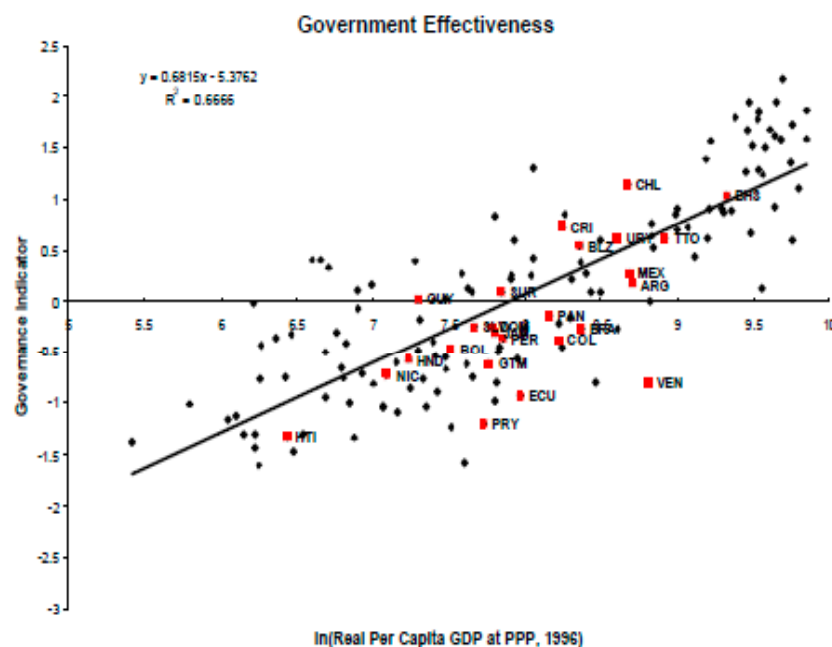**Inflation (1990-2011)**

■ LICs with strong growth
■ LICs with weak growth

Sources of Growth

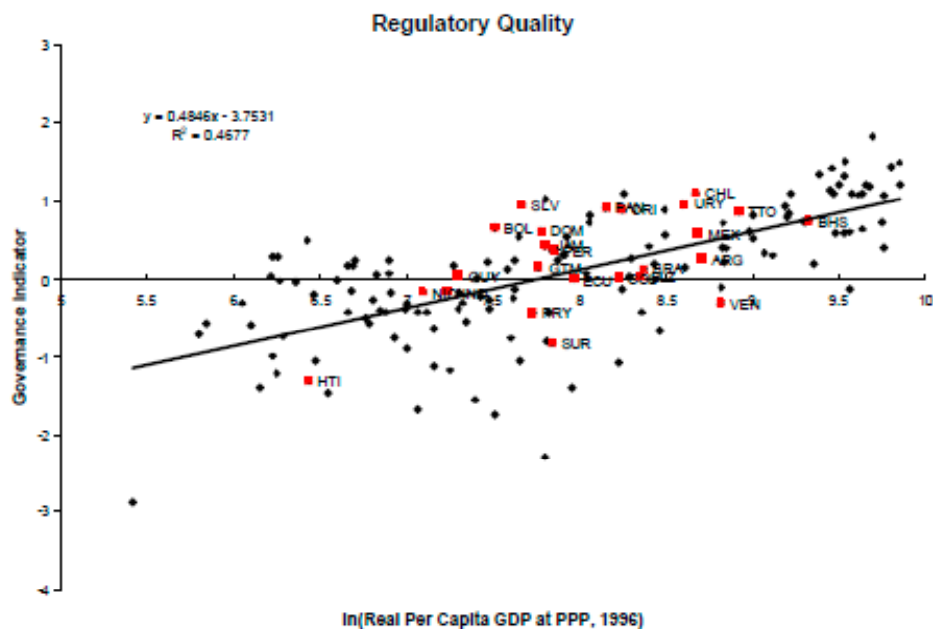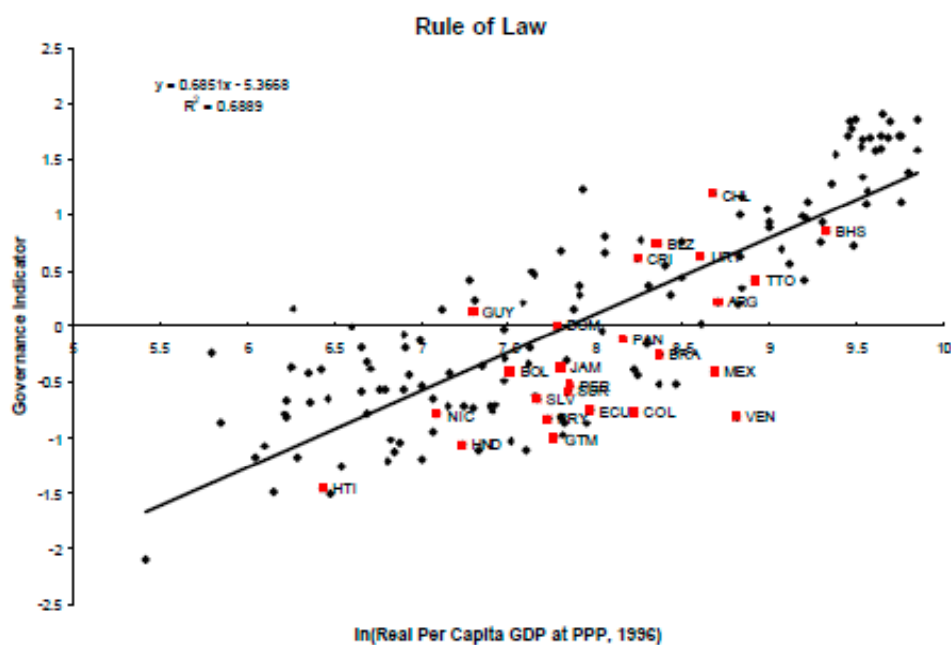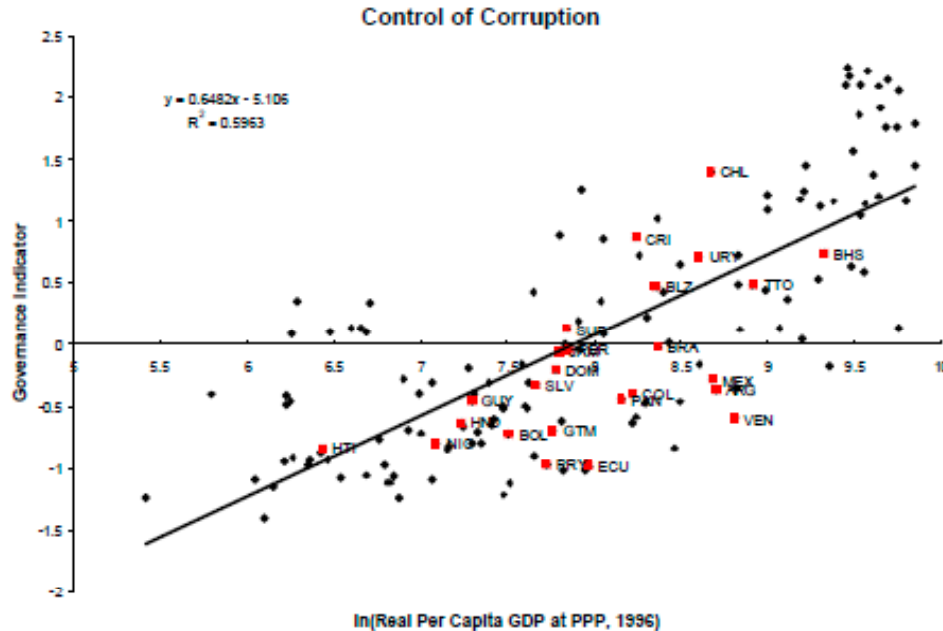## Quality of institutions and governance is another important growth factor

Sources of Growth

Source: See Kaufmann and Kray, Growth Without Governance, p. 40

Sources of Growth

Source: See Kaufmann and Kray, Growth Without Governance, p. 40

Sources of Growth

Source: See Kaufmann and Kray, Growth Without Governance, p. 41

Sources of Growth

Control of Corruption

y = 0.6482x - 5.1106
R² = 0.5963

Governance Indicator

ln(Real Per Capita GDP at PPP, 1996)

Sources of Growth

What does this imply for Myanmar?

Myanmar's growth performance in coming years should benefit from

- Ongoing transition to market economy
  → efficiency gains
- Greater trade integration
  → efficiency gains, innovation
- Public sector reforms
  → quality of institutions
- Boost to education and health spending
  → human capital formation

Outline

I. Real Sector Overview

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Inflation

What is inflation?

- Inflation is a **sustained** increase in the **overall** price level

  – Increase in average prices of all goods and services vs. change in relative prices of individual goods and services

  – Sustained increase vs. one-time increase in the price level

Inflation

Why do we care about inflation?

- Reasonably low inflation is equivalent to price stability
  → key element of macroeconomic stability
  → matters for growth
- High inflation has adverse impact especially on poor
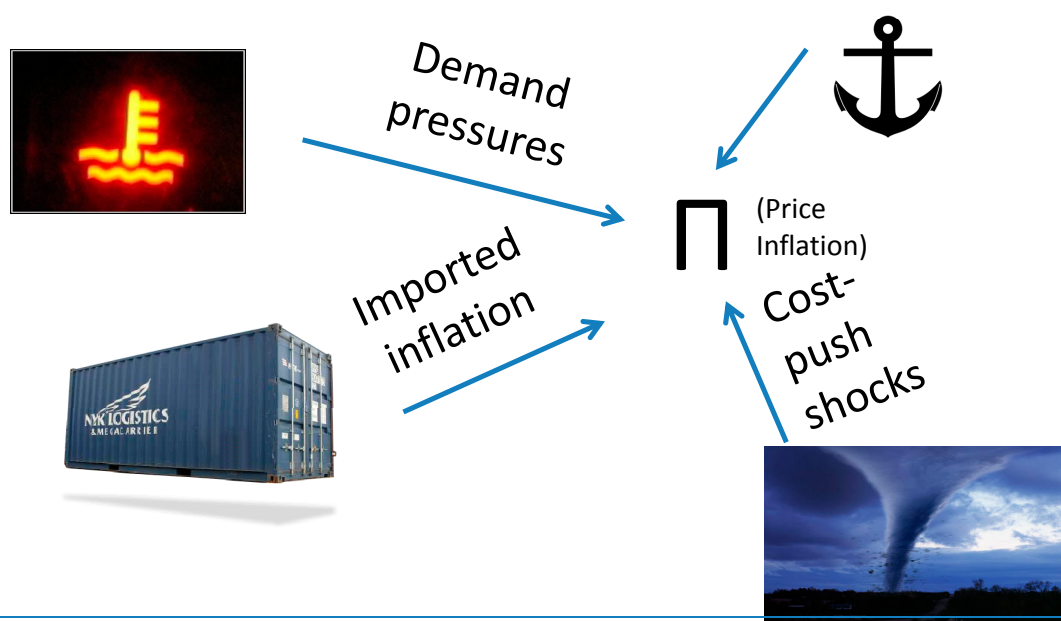- Many macroeconomic variables have a price component, for example:

  Nominal GDP = Real GDP * GDP Deflator

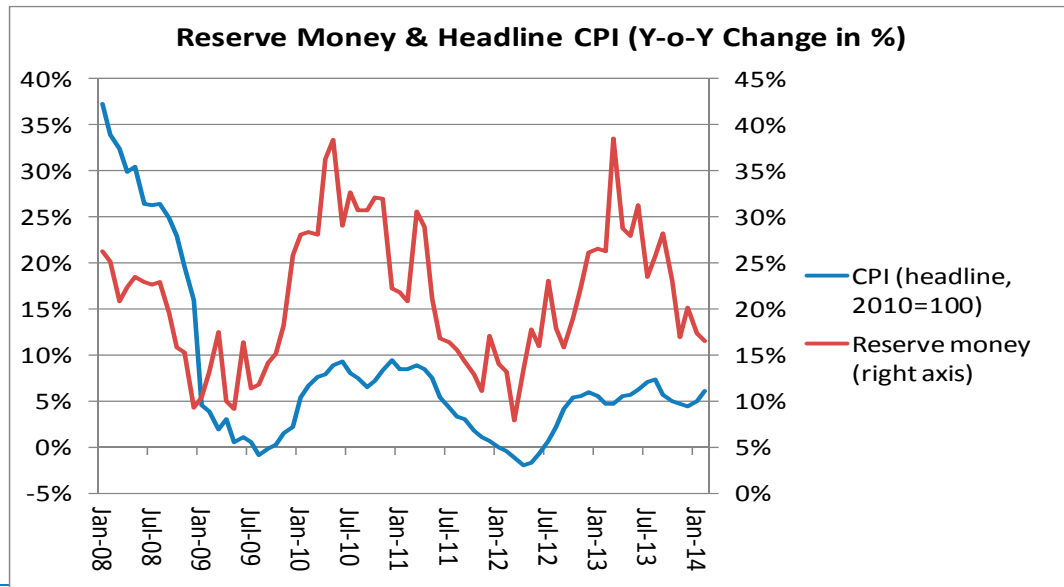 → Inflation helps understanding the price component
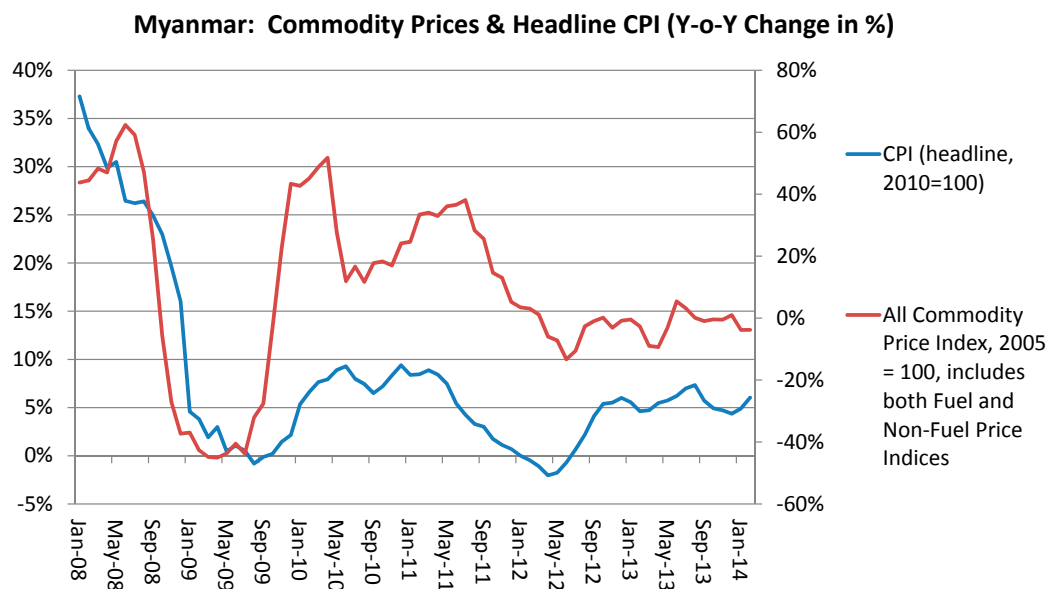

Inflation

Inflation determinants

Demand pressures

Imported inflation

∏ (Price Inflation)

Cost-push shocks

Inflation

Inflation determinants in Myanmar: reserve money matters …

Reserve Money & Headline CPI (Y-o-Y Change in %)

Legend:
- CPI (headline, 2010=100)
- Reserve money (right axis)

Inflation

… and so do international commodity prices:

Myanmar: Commodity Prices & Headline CPI (Y-o-Y Change in %)

Legend:
- CPI (headline, 2010=100)
- All Commodity Price Index, 2005 = 100, includes both Fuel and Non-Fuel Price Indices

Inflation

The role of the exchange rate becomes visible when we consider quarterly inflation rates:
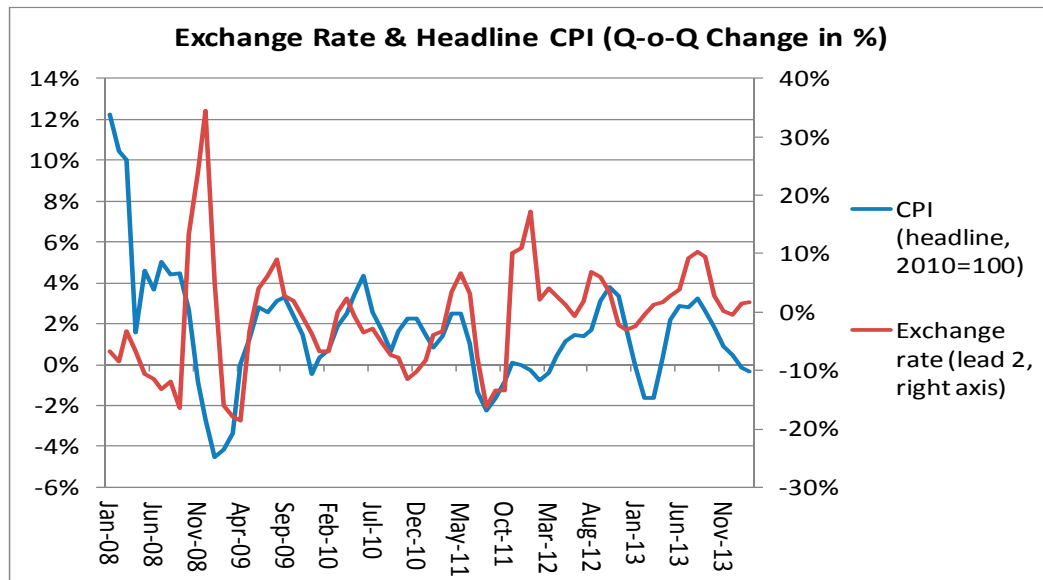
Exchange Rate & Headline CPI (Q-o-Q Change in %)

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Forecasting GDP

Why does forecasting GDP matter?

- GDP forecast is the starting point for many other forecasts, e.g., revenues or imports
- Similarly, GDP forecasts are necessary for projecting GDP ratios
- GDP forecasts are central for macroeconomic management

Forecasting GDP

It's difficult …

- It's very rare that the forecast hits exactly the mark (if so, it's just luck!)
- The forecast 'number' is important (e.g., for the budget), but …
- … the 'story' behind the forecast is often as important

Forecasting GDP

General procedure

• Start with analyzing the past → what were key developments and how are they going to affect the present and future?

• What do we know about the present (nowcast)?

• Forecast is an extrapolation of past and present, taking policy (changes) into account

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Forecasting GDP

Remember distinction between nominal and real:

- *Nominal GDP:* measures the value of output of the economy at current prices

- *Real GDP:* measures the value of output of the economy -- changes in an economy's physical output -- using prices of a fixed base year

- *GDP deflator*: price component of GDP, computed as *Nominal GDP/Real GDP*

Forecasting GDP

Typical forecasting approach:

- Start with forecasting real GDP

- Forecast inflation

- Forecast GDP deflator as function of inflation forecast

- Compute
  Nominal GDP = Real GDP x GDP Deflator
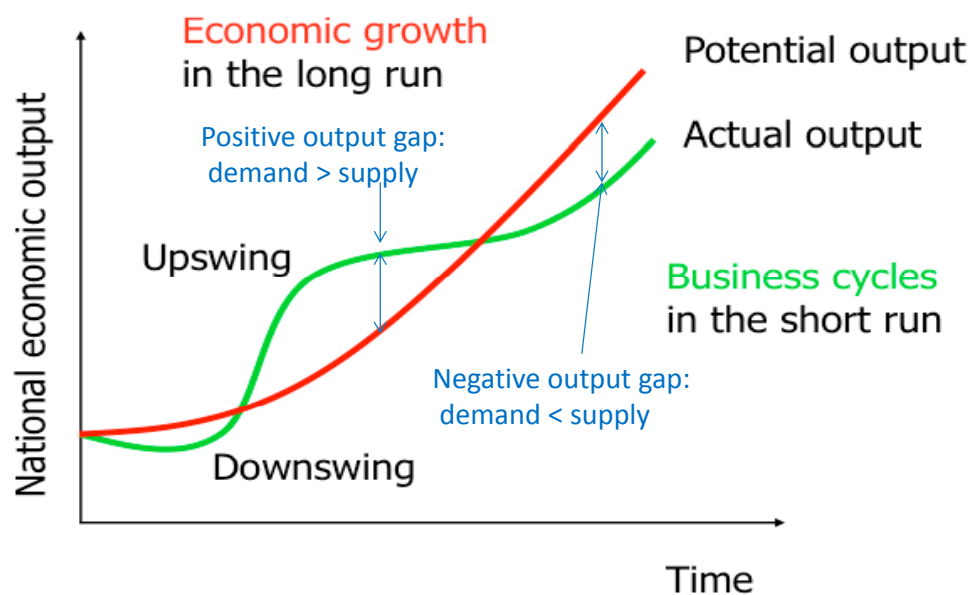
Forecasting Real GDP

Various approaches for forecasting real GDP:

- **Forecast**
  - Potential output and output gap
  - Supply-side approach:
    - Production function
    - Sectoral forecasts
  - Demand-side approach:
    forecast expenditures (C + I + X - M)
  - Reconciliation of Supply & Demand

Forecasting Real GDP

Potential output and output gap:

Forecasting Real GDP

Supply-side: production-function approach

- **Q = f (K, L, A)**

  where   K = Capital

                L = Labor

                A = Technology, Institutions

- In the long run, increasing *supply* requires increasing A (through structural policies)

Forecasting Real GDP

Supply-side: sectoral forecasts

Forecast production in each sector separately as they may have different determinants, then add up the individual forecasts to obtain the total:

$$\frac{GDP_{t+1}}{GDP_t} = w_{agr}\frac{GDP_{agr,t+1}}{GDP_{agr,t}} + w_{man}\frac{GDP_{man,t+1}}{GDP_{man,t}} + w_{ser}\frac{GDP_{ser,t+1}}{GDP_{ser,t}} + ...$$

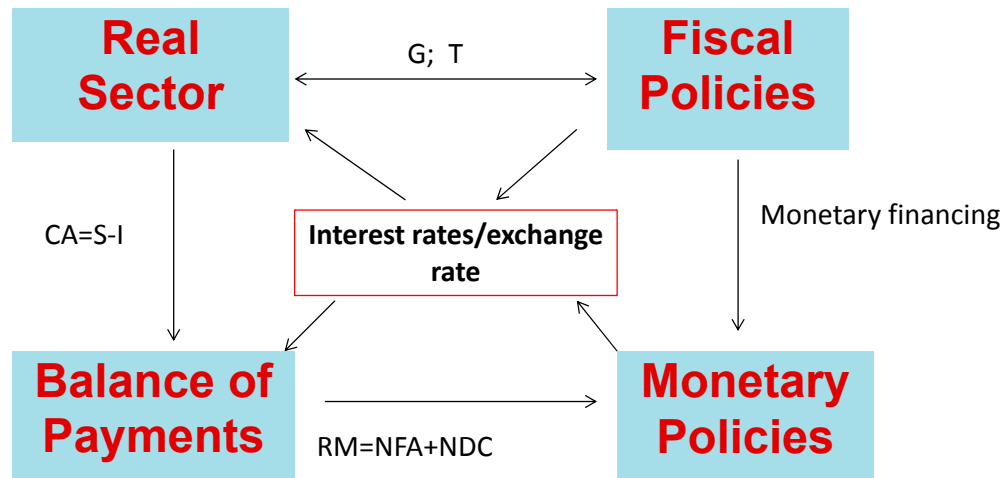# Forecasting Real GDP

Demand-side: forecasting expenditures

GDP = (C_P + C_G) + (I_P + I_G) + ($X − M$)

➔ We should be able to forecast public consumption and investment (C_G & I_G) using information from the budget

➔ We might be able to construct forecast equations for exports and imports ($X − M$) [External sector]

➔Private consumption (C_P) is often fairly steady and not that difficult to forecast

➔Leaves private investment (I_P) as a very difficult element to forecast because this tends to be fairly volatile

Forecasting GDP

Forecasting tools: macroeconomic framework

Real Sector	G; T	Fiscal Policies

CA=S-I

Interest rates/exchange rate

Monetary financing

Balance of Payments	RM=NFA+NDC	Monetary Policies

Ongoing work! Core group including MNPED just started work on Myanmar's macroeconomic framework

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Forecasting GDP

Forecasting tools

IMF Article IV mission will arrive on Wednesday

Compare your own forecasts to those of the IMF!

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Outlook

Next, we will explore in more detail …

- … the fiscal sector, which helps with analyzing public consumption and investment (C_G & I_G)

But first we will have