

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

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Outline

- I. Real Sector Overview
- II. Measuring and Analyzing GDP
- III. Sources of Growth
- IV. Inflation
- V. Forecasting GDP

Table 1. Myanmar: Selected Economic Indicators, 2010/11–2015/16 1/							
	2010/11	2011/12	2012/13	2013/14 Est.	2014/15 Proj.	2015/16	
Output and prices		(Percent change)					
Real GDP (authorities)	10.4	5.9	7.3	8.7	9.1		
Real GDP (staff working estimates)	5.3	5.9	7.3	8.3	8.5	8.5	
CPI (end-period)	8.9	-1.1	4.7	6.3	5.9	6.7	
CPI (period average)	8.2	2.8	2.8	5.7	6.6	6.3	
						-	
Memorandum items							
GDP (billions of kyats) 4/	39,847	43,368	47,851	54,756	63, 323	73,042	
GDP (billions of US\$)	49.6	56.2	55.8	56.8	65.3	73.6	
GDP per capita (US\$)	998	1,121	1,103	1,113	1,270	1,420	

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



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)



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

Why is GDP so important?

- Measure of output
- Approximation of welfare
- Many other variables are moving broadly proportional to GDP (e.g., revenues)
 - \rightarrow GDP ratios
 - \rightarrow GDP forecast is basis for revenue forecasts etc.
- Macroeconomic management: keeping GDP roughly in line with its potential

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



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

Key concepts: Investment

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



Key concepts: Exports

What Myanmar sells abroad...



Key concepts: Imports

What you buy from abroad ...



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

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

Example: Nominal wages \uparrow 20%

↑ If inflation was 10%, Real buying power grew

BUT

↓If inflation was 30%, Real buying power shrank

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+ ∆%V/100) =(1+∆%P/100)*(1+∆%Q/100)



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Production approach: GDP Shares



Production approach: real GDP growth by sector



Production approach: growth contributions by sector



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

Expenditure approach links real sector to other sectors:





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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.



'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?



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)



Source: AFBF, USDA National Resources Inventory (2007)

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)*

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

		2000			
	Annual	Annual		Annual	
	Growth	Growth	Contribution	Growth	
	Rate of Y	Rate of Y/L	of K/L	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%	
		$(\alpha = 0.4)$			

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).

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".								

Recent IMF Research Results on Growth Factors

World Economic and Financial Surveys

World Economic Outlook

Hopes, Realities, Risks



Investment is associated with higher growth ...

 This is consistent with the finding from growthaccounting 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

 \rightarrow Investment is not the only factor that matters!



... 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



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)

Reigning in high inflation promotes growth:

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



Quality of institutions and governance is another important growth factor











What does this imply for Myanmar?

Myanmar's growth performance in coming years should benefit from

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



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What is inflation?

- Inflation is a <u>sustained</u> increase in the <u>overall</u> price level
 - Increase in average prices
 of all goods and services
 vs. change in relative
 prices of individual goods
 and services
 - Sustained increase vs. onetime increase in the price level



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

 \rightarrow Inflation helps understanding the price component

Inflation determinants



Inflation determinants in Myanmar: reserve money matters ...



... and so do international commodity prices:



The role of the exchange rate becomes visible when we consider quarterly inflation rates:



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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



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



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



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

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 GDP & Output Gap



Time

Forecasting Real GDP —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—Sectoral Forecasts

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:

Let's practice this!



Forecasting Real GDP—Demand Approach

Demand-side: forecasting expenditures

$$GDP = (C_{P} + C_{G}) + (I_{P} + I_{G}) + (X - M)$$

Fiscal sector BOP

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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]

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

 \rightarrow Leaves private investment (I_P) as a very difficult element to forecast because this tends to be fairly volatile 58

Forecasting GDP Deflator

Real Consumption	×	Consumption Deflator	=	Nominal Consumption	
Real Investment	×	Investment Deflator	=	Nominal Investment	
Real Exports	×	Export Deflator	=	Nominal Exports	
–Real Imports	×	Import Deflator	=	–Nominal Imports	
Real GDP				Nominal GDP	
GDP Deflator = $\frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$					

Forecasting Components of GDP Deflator

- **Consumption:** $\%\Delta P_C = \%\Delta CPI$
- Investment: $\%\Delta P_{I} = (1-a)\%\Delta CPI + a\%\Delta P_{M}$ (a = share of imported investment goods)

Export:

 $\Delta P_X = ((1+\Delta Export price in US$/100) * (1+\Delta Exchange rate/100) -1) *100$

Import:

 $\%\Delta P_{M} = ((1+\%\Delta \text{ Import price in US}/100) * (1+\%\Delta \text{ Exchange rate}/100) -1) *100$

Forecasting Nominal GDP

Putting it all together:

- Forecast real GDP growth
- Forecast GDP deflator
- Compute nominal GDP growth, using

Value_{t+1} = Value_t× (1+% Δ P) × (1+% Δ Q)

Forecasting GDP—Other Sources

Forecasting tools

Compare your own forecasts to those of the IMF!



Outlook

Next, we will explore in more detail ...

• ... the fiscal sector, which helps with analyzing public consumption and investment ($C_G \& I_G$)