



Refresher on Real Sector & Generating a first GDP Forecast

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Outline

- I. **General Approach to Forecasting GDP**
- II. Forecasting Real GDP
- III. Forecasting Inflation & GDP Deflator
- IV. Putting It All Together: Nominal GDP

General Approach to 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



General Approach to 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: **this is why we spent the first session looking at the 'big picture'!**



General Approach to Forecasting GDP

General procedure

- Start with analyzing the past: what were key developments and how are they going to affect the present and future?
 - ✓ We looked at recent economic developments during the first session
- What do we know about the present (nowcast)?
 - ✓ We will look at available indicators in the afternoon



General Approach to Forecasting GDP

General procedure (continued)

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

✓ You have studied the growth potential and developed a growth strategy, both of which should help to guide the forecast



General Approach to 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 $Nominal\ GDP / Real\ GDP$

General Approach to Forecasting GDP

Typical forecasting approach:

- Start with forecasting real GDP
- Forecast inflation
- Forecast GDP deflator as function of inflation forecast
- Compute
$$\text{Nominal GDP} = \text{Real GDP} \times \text{GDP Deflator}$$

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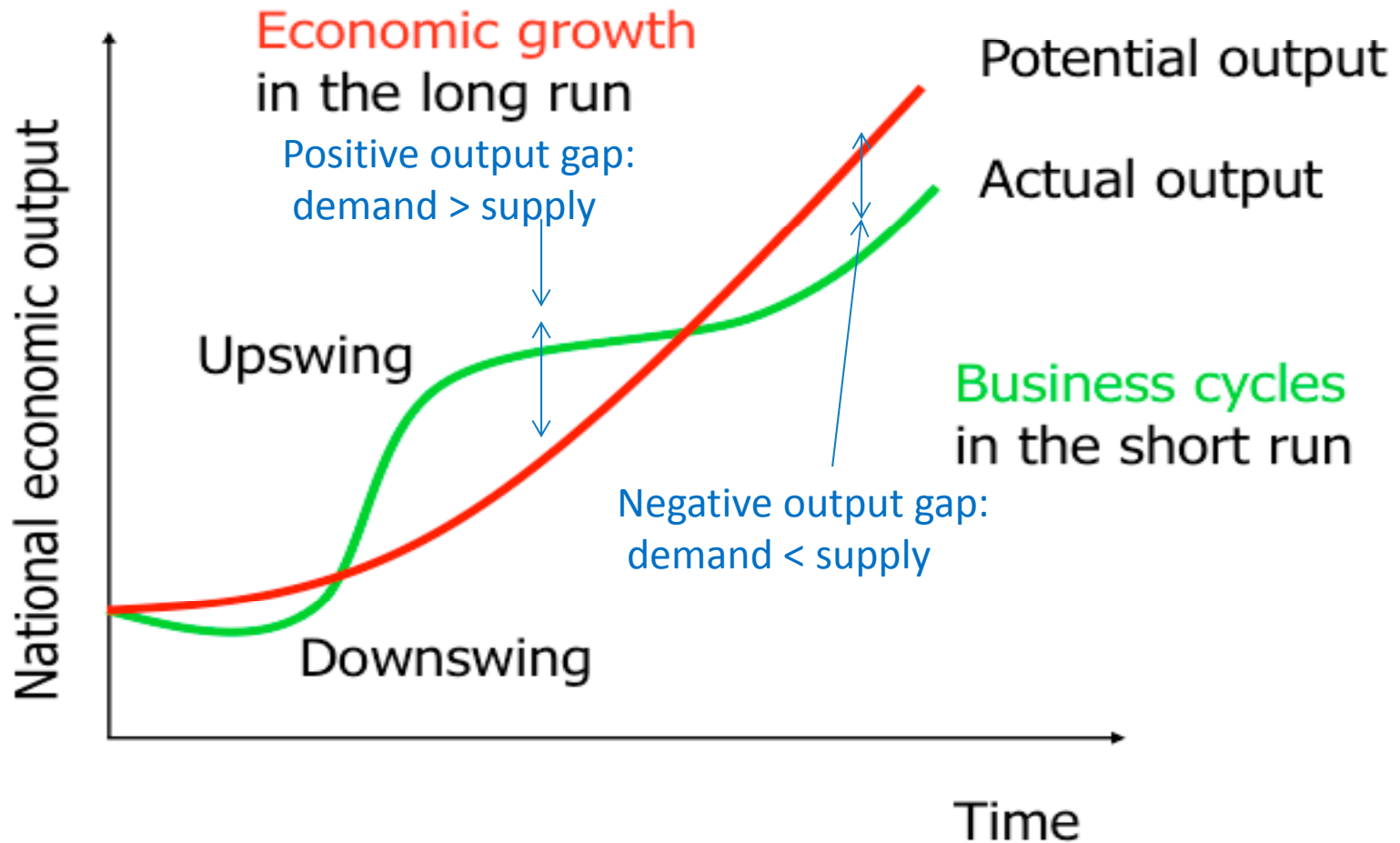
Forecasting Real GDP

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



Forecasting Real GDP

—Potential GDP & Output Gap

How does this approach help us?

- Our study of the growth potential in the first session provides us with an idea of the underlying growth rate of Myanmar's economy, which is equivalent to estimating the path for Myanmar's potential output
- Actual output will deviate from potential output depending on demand condition: later in the workshop we will consider the impact of fiscal, monetary and external conditions on demand and adjust the real GDP forecast accordingly

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

—Production Function Approach

How does this approach help us?

- We won't use this approach directly
- But this approach has helped us indirectly already because a production function is central to the ADB growth scenarios that guide our estimate of Myanmar's underlying real GDP growth rate

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:

We practiced this
in the introductory
workshop ...

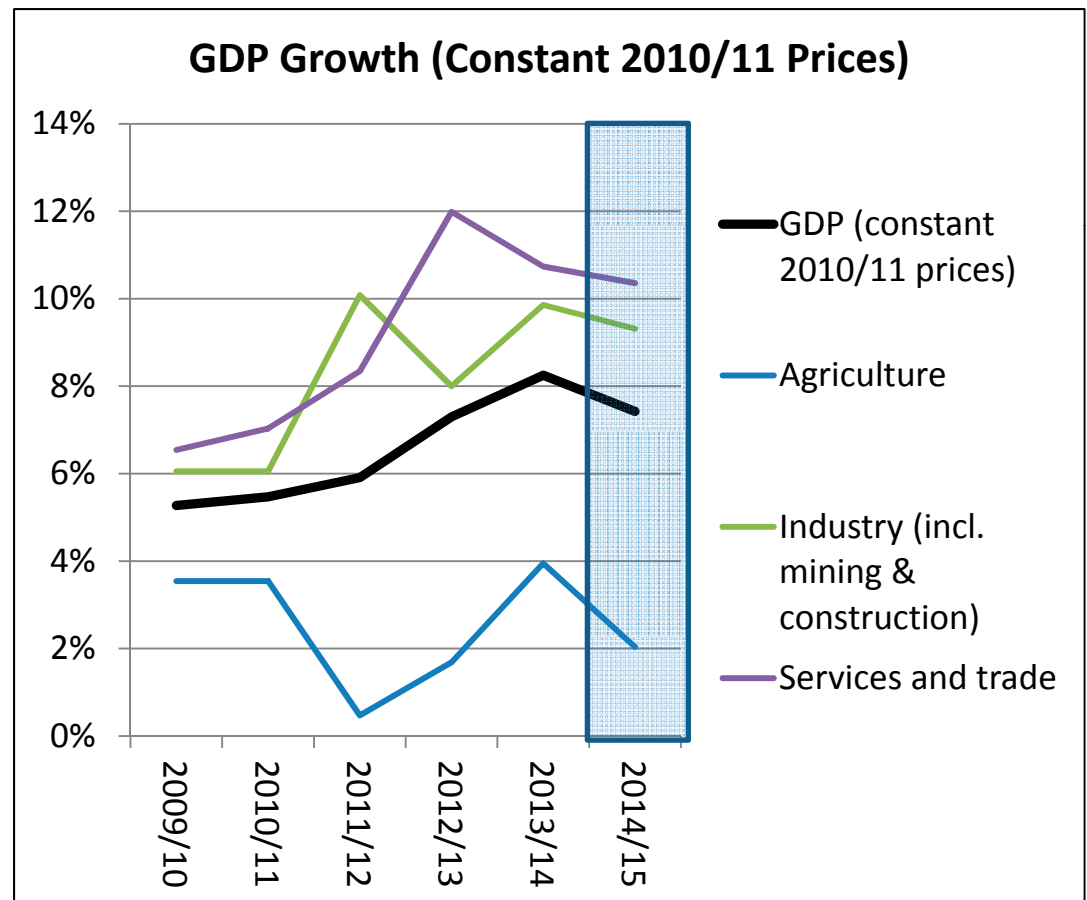


Forecasting Real GDP—Sectoral Forecasts

Sectoral forecasts: how does this approach help us?

This will be the main method for you to generate your real GDP forecast in the macroeconomic framework in the following workshop session.

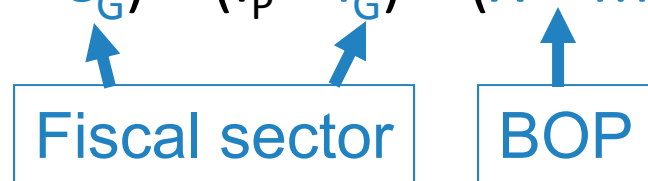
You need to make sure that your sectoral forecasts are consistent with your growth strategy and other considerations from the first session ...



Forecasting Real GDP—Demand Approach

Demand-side: forecasting expenditures

$$\text{GDP} = (C_p + C_G) + (I_p + I_G) + (X - M)$$



- We should be able to forecast public consumption and investment (C_G & I_G) using information from the budget
- We have 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 Real GDP—Demand Approach

How does this approach help us?

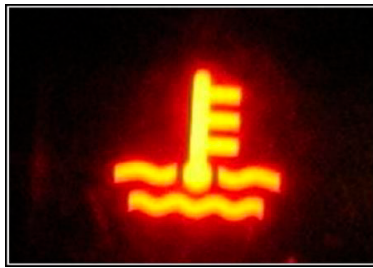
- The expenditure approach is closely linked to analyzing demand conditions and therefore to the aforementioned output gap approach
- Later in the week when we consider fiscal, monetary and external conditions, we will make adjustments to the real GDP forecast to reflect the demand approach
- Next week, when we put the forecast together, we will need to make sure that the supply- and demand approaches are consistent with each other

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Forecasting Inflation & GDP Deflator

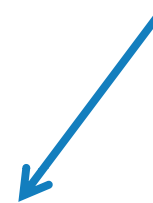
Inflation determinants



Demand pressures

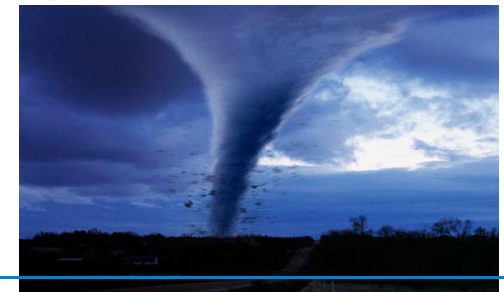


Imported inflation



(Price Inflation)

Cost-push shocks



Forecasting Inflation & GDP Deflator

Macroeconomic framework forecasts inflation (automatically) as a function of:

- It's own past → captures sluggish adjustment of inflation to shocks/changes in its determinants
- A constant → captures broadly the level of inflation in the absence of any other determinants: represents the inflation anchor
- Reserve money growth → captures role of monetary policy (and partly demand conditions)

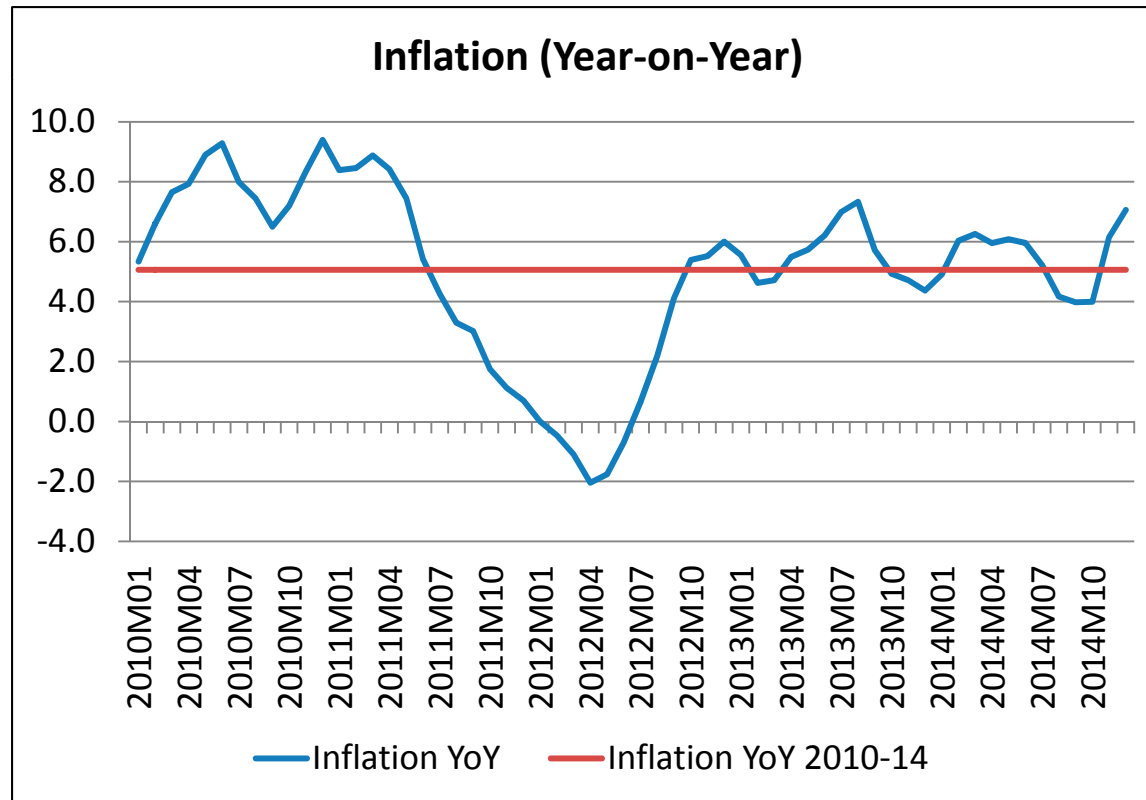
Forecasting Inflation & GDP Deflator

Macroeconomic framework forecasts inflation (automatically) as a function of (continued):

- International food commodity prices → captures role of imported inflation in form of import prices in foreign currency (US dollars)
- Kyat/US dollar exchange rate → captures role of imported inflation in form of exchange rate pass through

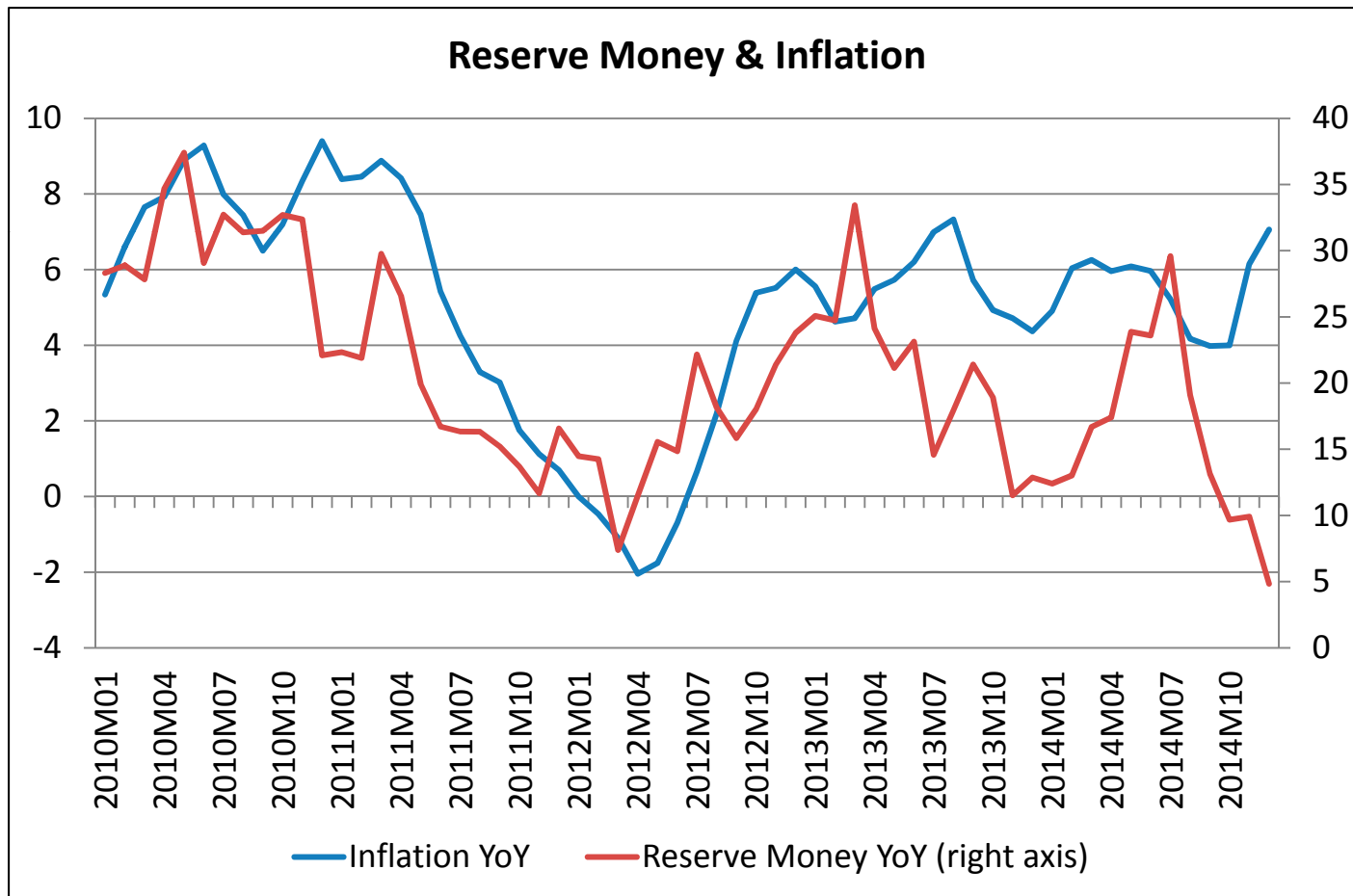
Forecasting Inflation & GDP Deflator

Average inflation 2010-14: serves approximately as inflation anchor, i.e., you can expect that in the medium term inflation will converge to this level:



Forecasting Inflation & GDP Deflator

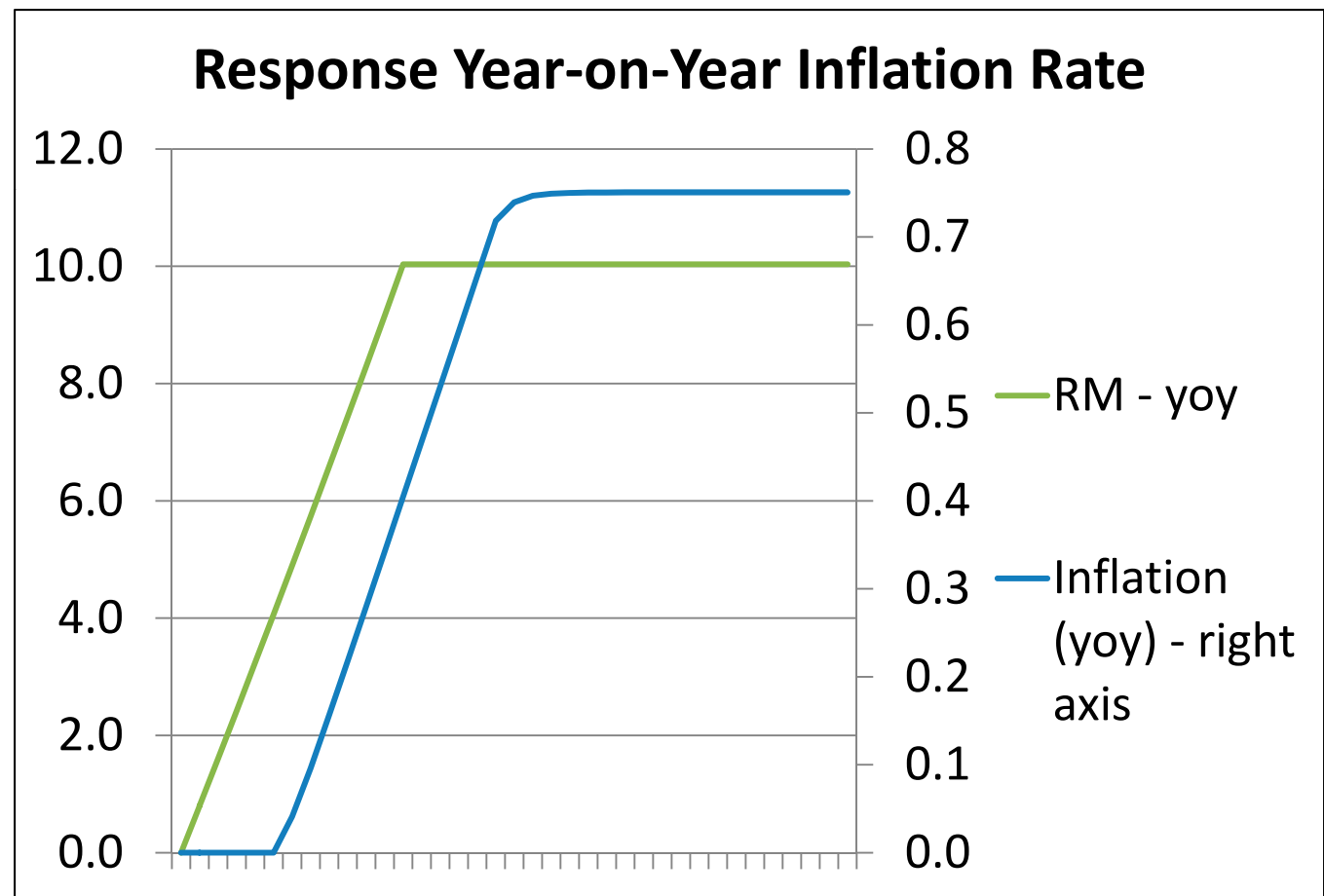
Reserve money matters for inflation in Myanmar:



Forecasting Inflation & GDP Deflator

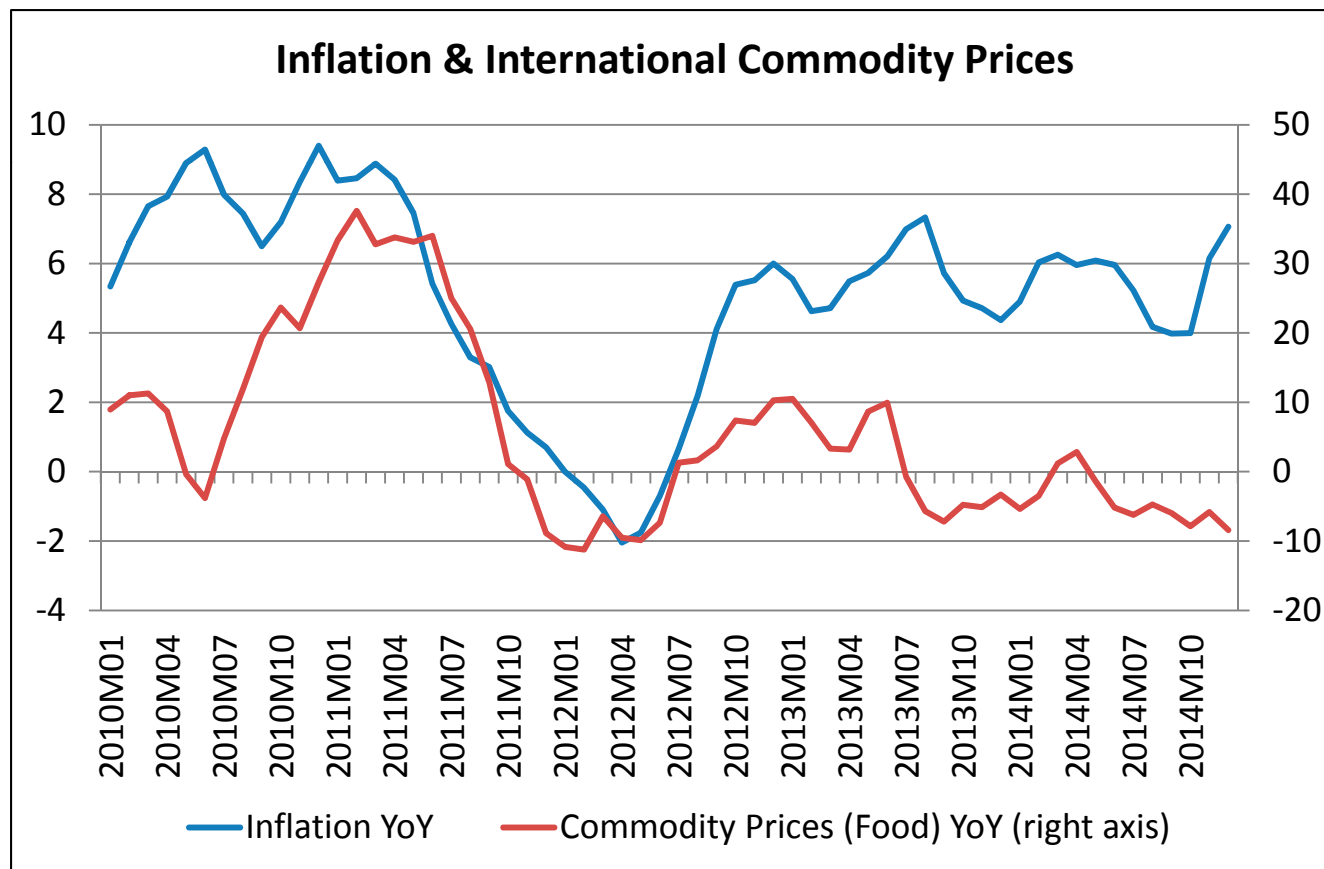
Link between reserve money growth & inflation in inflation model in macroeconomic framework:

Increase in annual reserve money growth by 10% raises annual inflation by about 1% with about 5 months delay.



Forecasting Inflation & GDP Deflator

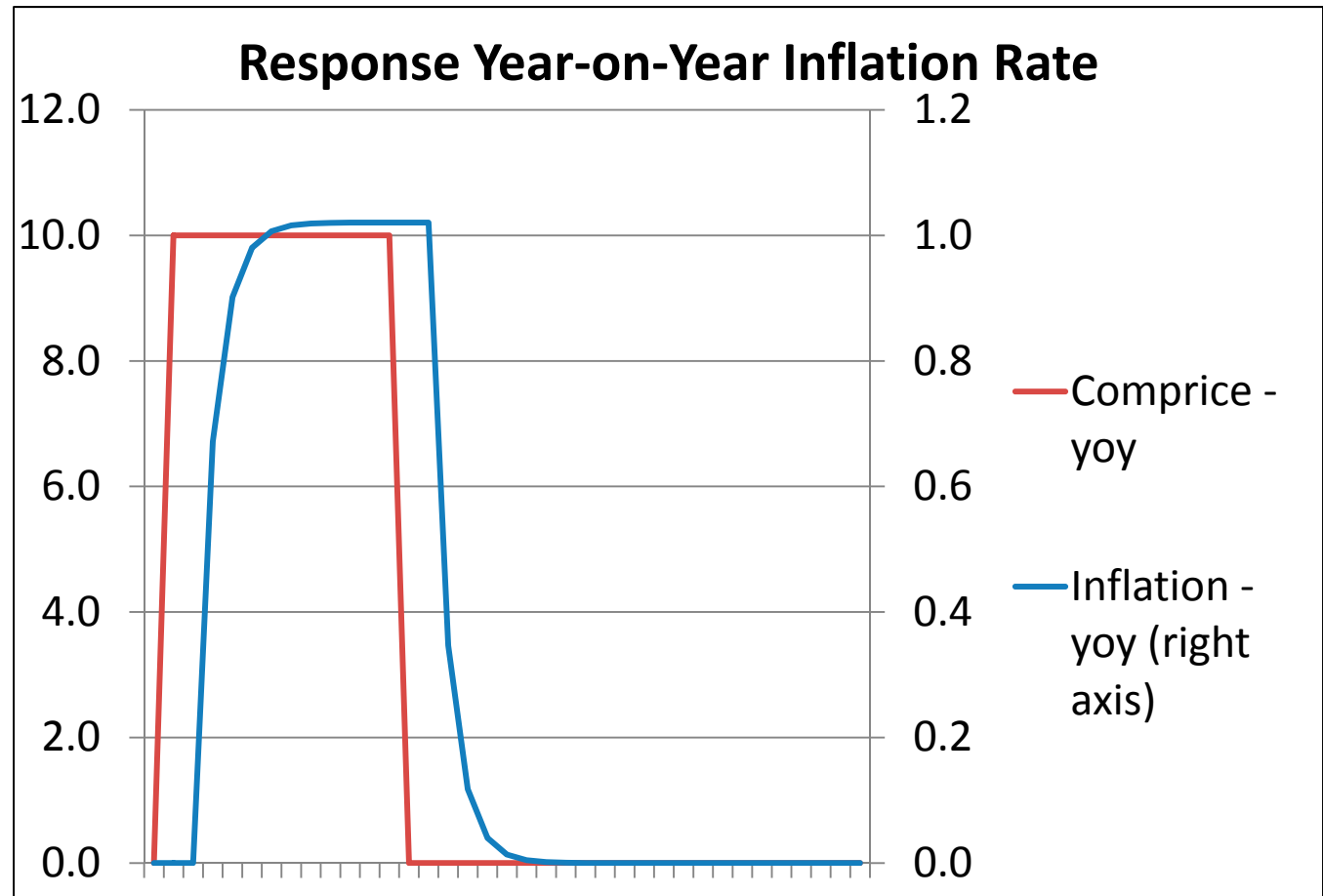
International food commodity prices also have a noticeable influence:



Forecasting Inflation & GDP Deflator

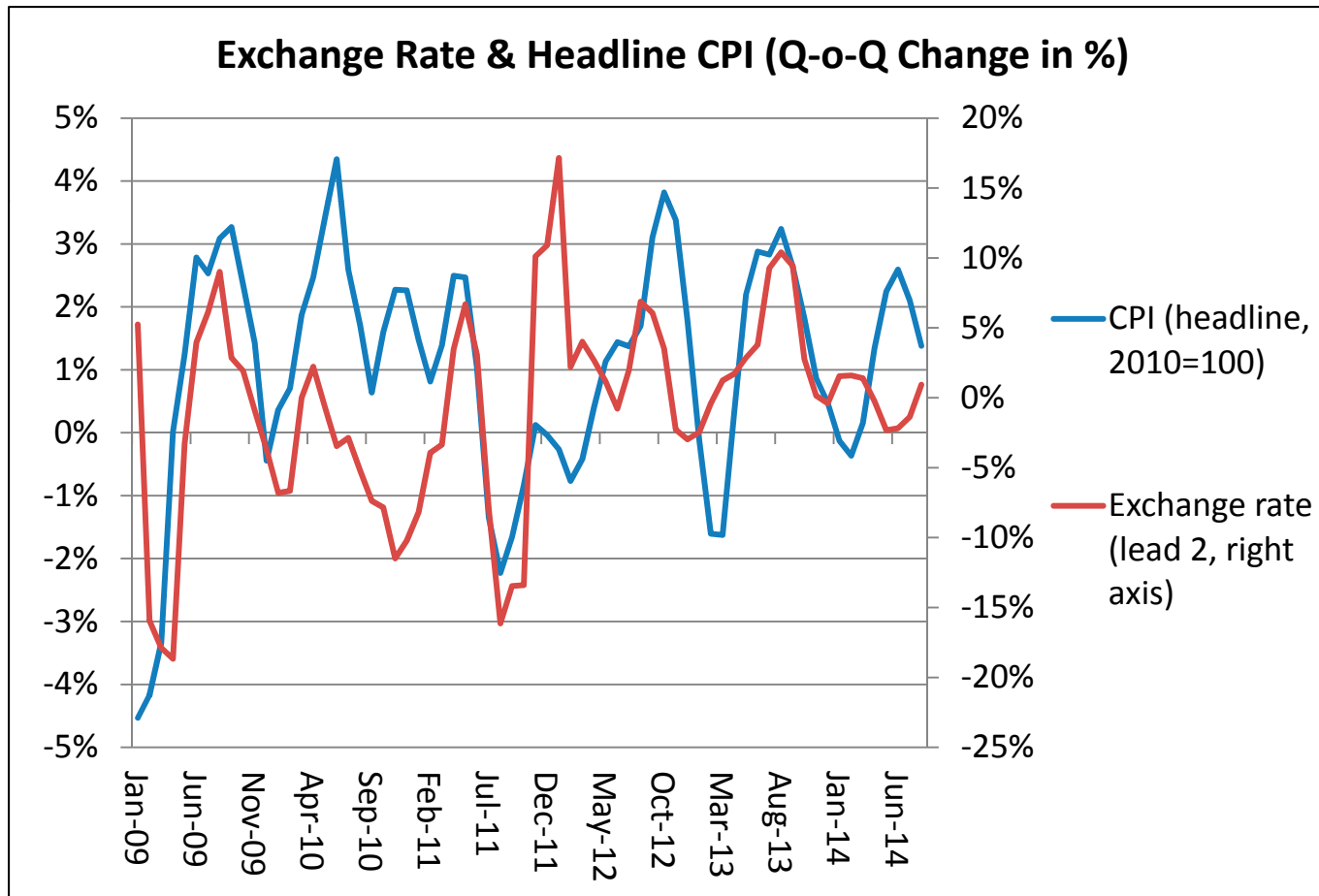
Link between food commodity price growth & inflation in inflation model in macroeconomic framework:

Increase in international food prices by 10% raises annual inflation by about 1% with about 2 months delay.



Forecasting Inflation & GDP Deflator

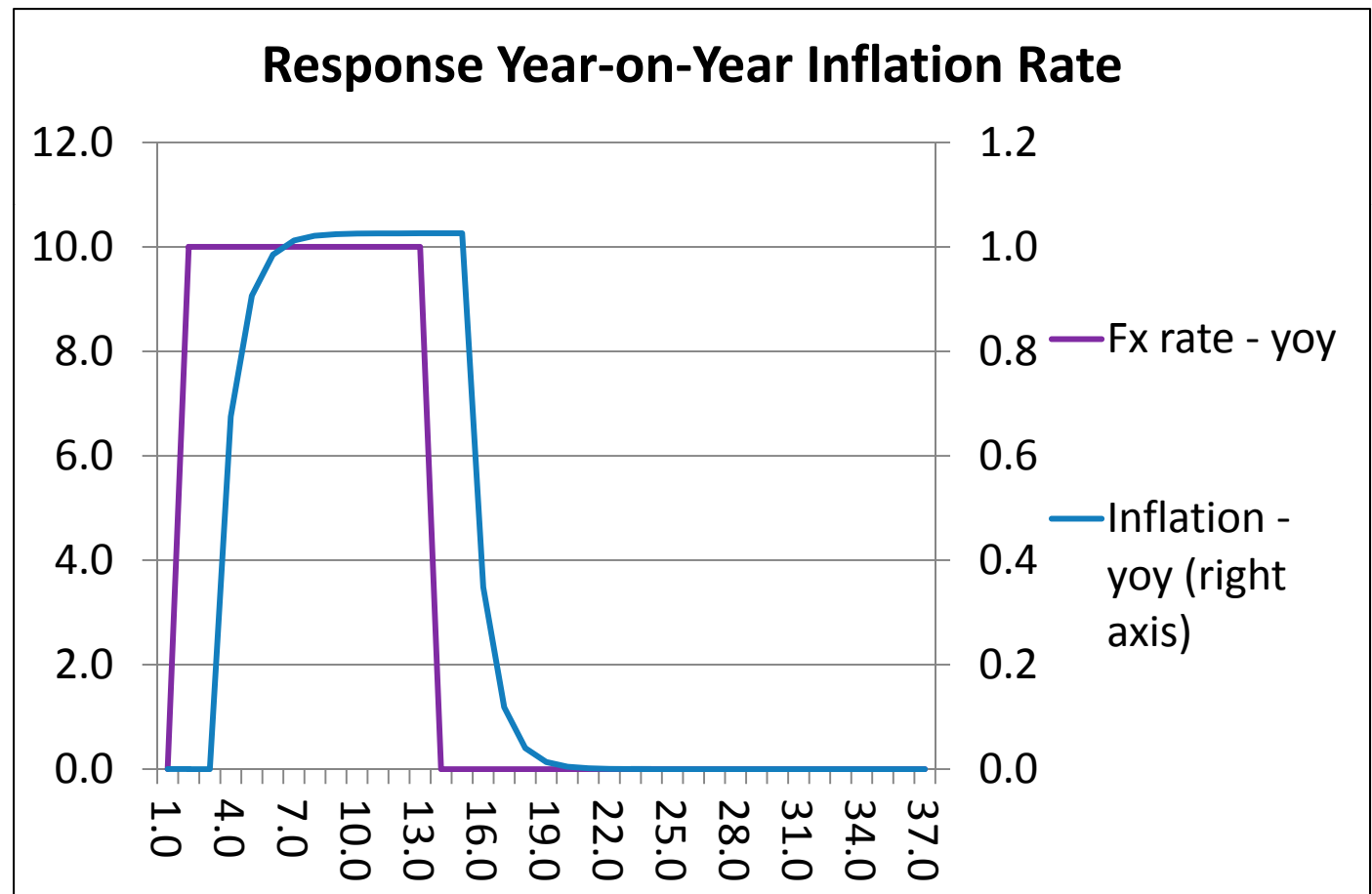
The role of the exchange rate becomes visible when we consider quarterly inflation rates:



Forecasting Inflation & GDP Deflator

Link between kyat/US dollar exchange rate & inflation in inflation model in macroeconomic framework:

Depreciation of kyat/US dollar rate by 10% raises annual inflation by about 1% with about 2 months delay.



Forecasting Inflation & GDP Deflator

Definition of GDP deflator

$$\begin{array}{rcccl} \text{Real Consumption} & \times & \text{Consumption Deflator} & = & \text{Nominal Consumption} \\ \text{Real Investment} & \times & \text{Investment Deflator} & = & \text{Nominal Investment} \\ \text{Real Exports} & \times & \text{Export Deflator} & = & \text{Nominal Exports} \\ \text{-Real Imports} & \times & \text{Import Deflator} & = & \text{-Nominal Imports} \\ \text{Real GDP} & & & & \text{Nominal GDP} \end{array}$$

$$\text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

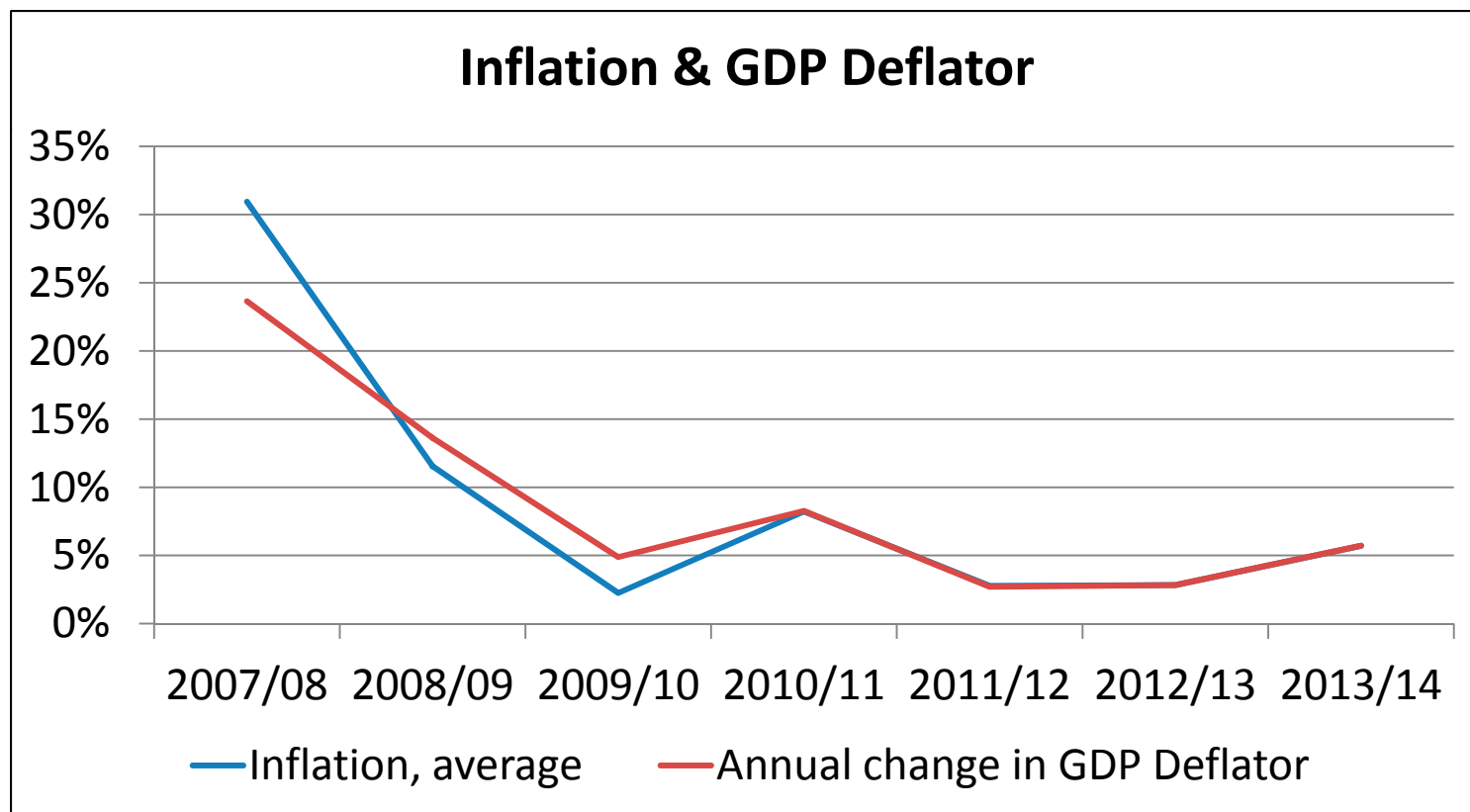
Forecasting Inflation & GDP Deflator

Forecasting the GDP deflator

- **Consumption:** $\% \Delta P_C = \% \Delta \text{CPI}$
- **Investment:** $\% \Delta P_I = (1-a) \% \Delta \text{CPI} + a \% \Delta P_M$
(a = share of imported investment goods)
- **Export:**
$$\% \Delta P_X = \left((1 + \% \Delta \text{Export price in US\$/100}) * (1 + \% \Delta \text{Exchange rate/100}) - 1 \right) * 100$$
- **Import:**
$$\% \Delta P_M = \left((1 + \% \Delta \text{Import price in US\$/100}) * (1 + \% \Delta \text{Exchange rate/100}) - 1 \right) * 100$$

Forecasting Inflation & GDP Deflator

For Myanmar, change in GDP deflator and annual inflation move very closely together, so we can project GDP deflator directly as a function of inflation:



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Putting It All Together: Nominal GDP

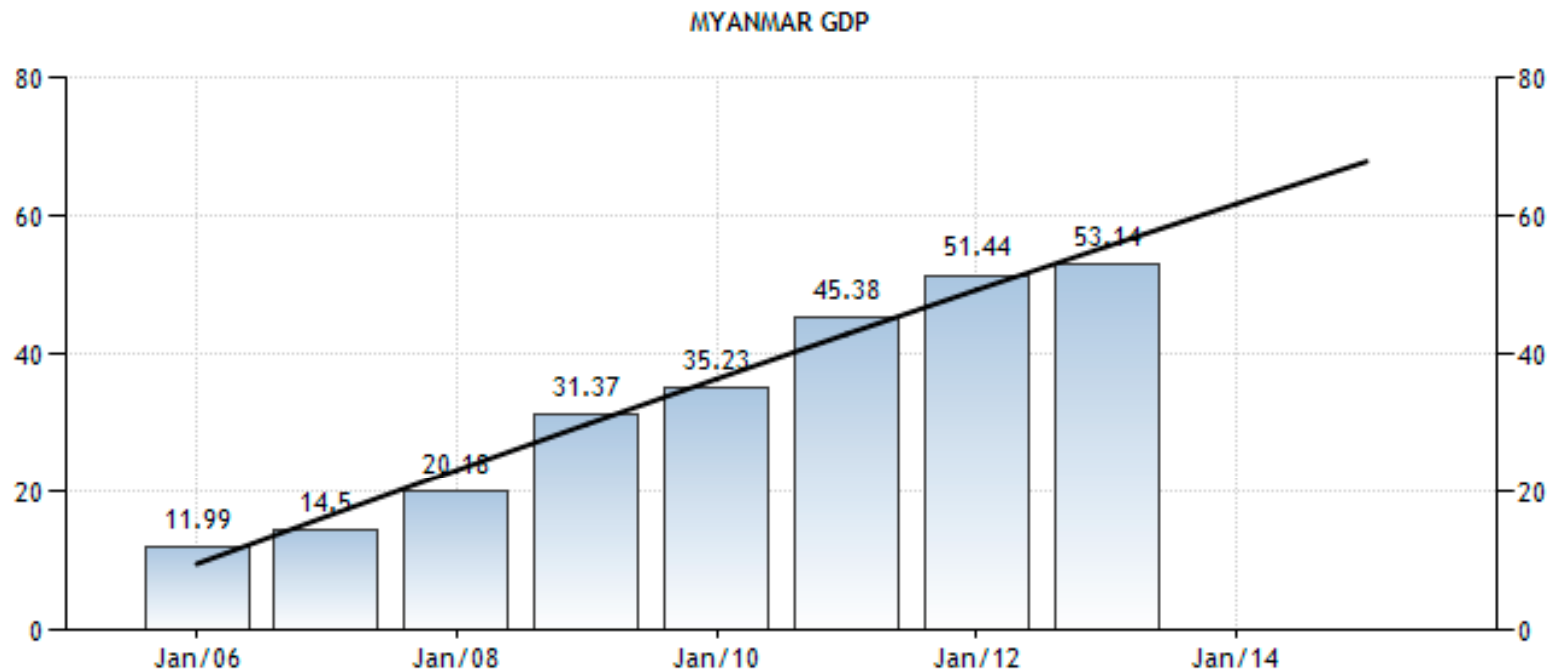
Nominal GDP forecast:

- Forecast real GDP growth
- Forecast GDP deflator
- Compute nominal GDP as

$$\text{Nominal GDP}_{t+1} = \text{Real GDP}_{t+1} \times \text{GDP Deflator}_{t+1}$$

Outlook

Next, you will generate a first draft of the GDP forecast:



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