1 Data in Levels

1.1 Penn World Tables

- PPP-converted data
  - value all goods and services at US prices
  - by valuing goods at same prices, cross-country comparisons are meaningful

- Data is per capita and quadratically detrended

- Weights are relative population sizes
1.2 Volatility

- Standard deviation of output across all countries is 8%, twice as large as for US at 3.3%

- Standard deviation of consumption across all countries is about as volatile as output (consumption smoothing?)

- Standard deviation of government consumption is more volatile than output (inconsistent with Keynesian stabilization policy)

- Investment, exports, and imports are more than twice as volatile as output

- Trade balance/output has a standard deviation equal to 3.5% of the SD of GDP
1.3 Cyclicality

- A variable is procyclical if it moves with output

- Procyclical variables include
  - Consumption (the most procyclical)
  - Government spending (inconsistent with Keynesian stabilization policy)
  - Investment
  - Exports
  - Imports
• Trade balance/output is roughly acyclical
1.4 Persistence

- Output is highly persistent with serial correlation of 0.79

- Other components of spending are roughly as persistent
2 Comparisons among Poor, Emerging, and Rich Countries

2.1 Measurement

- Geometric average of PPP-converted GDP per capita in 2005 dollars over 1990-2009

- Poor countries: less than 3,000 per capita

- Emerging countries: 3,000 - 25,000 dollars per capita

- Rich countries: greater than 25,000 dollars per capita
2.2 Volatility

- Rich countries are about half as volatile as poor or emerging countries
  - more volatile shocks?
  - precarious economic institutions?

- Government consumption is less volatile among rich countries than among emerging or poor countries
2.3 Cyclicality

- Imports among rich countries have higher correlations with output.
- Exports have about equal correlations with output.
- Trade balance/output ratio very countercyclical in rich countries but roughly acyclical among others.

2.4 Emerging versus Poor

- Business cycles are similar in emerging and poor countries.
3 Comparisons between Small, Medium, and Large Countries

3.1 Measurement

- Small have population < 20 million
- Medium have 20 million < population < 80 million
- Large have population > 80 million
3.2 Volatility

- Small countries are more volatile than large ones

- Medium ones have volatility which depends on level of development
  - Higher income per capita and larger country size both reduce volatility

- Consumption/output volatility ratio
  - Falls with larger country size
  - Falls with higher income per capita
  - Consumption is as or more volatile that output among small and medium rich countries
3.3 Cyclicality

- Trade balance share of output
  - is more countercyclical the larger the country
  - is less countercyclical the more open is the economy
4 Data in Growth Rates

- A stochastic trend is an alternative representation of the data to a deterministic trend
- With a stochastic trend, compare growth rates of variables
4.1 Volatility

- Poor and emerging countries are twice as volatile as rich countries.

- Poor countries are not more volatile than emerging countries.

- Consumption growth is as or more volatile than output growth (consumption smoothing?)

- Government consumption growth is twice as volatile as private consumption growth.

- Investment growth is much more volatile than output growth or consumption growth.
• Export and import growth are about twice as volatile as output growth
4.2 Cyclicality

- Growth rates of all components of aggregate demand are procyclical.
- Trade balance/output is acyclical in poor and emerging markets and slightly countercyclical in rich countries.
5 Duration and Amplitude of Business Cycles in Emerging and Rich Economies

5.1 Definitions

- Peak: output observation that is larger than two immediately preceding and succeeding observations
  \[ y_t > y_{t-j}, \text{ for } j = -2, -1, 1, 2 \]

- Trough: output observation that is lower than two immediately preceding and succeeding observations
  \[ y_t < y_{t-j}, \text{ for } j = -2, -1, 1, 2 \]
• Duration
  – Cycle: period of time between one peak and the following peak
  – Contraction: period of time between a peak and the following trough
  – Expansion: period of time between a trough and the following peak

5.2 Data

• Quarterly data on real GDP 1980:1 - 2006:4

• 12 Latin American countries
- 12 OECD countries
5.3 Business Cycle Characteristics

- Contractions
  - On average short (about 11 months) in both sets of countries
  - Larger in emerging countries (6.2% of GDP compared with 2.2% of GDP)

- Expansions
  - Much longer than contractions
  - Shorter in emerging markets than in developed economies (16 vs 23 quarters)
– Amplitude is about same at 20% of GDP

● Duration of a cycle
  – Add length of expansion and contraction and find cycles are shorter in emerging markets due to shorter expansions

● Pattern of high volatility in emerging markets
  – More cycles per unit of time
  – More pronounced contractions on average