



ECON 202 - MACROECONOMIC PRINCIPLES

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Disclaimer

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Chapter 1 - Introduction to Macroeconomics

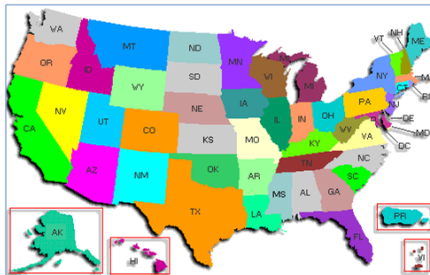
Topics

- What is Macroeconomics?
- Some US Facts
- What is a Model?

Some US Facts

Considering the biggest economy in the world

Figure 1: The United States of America



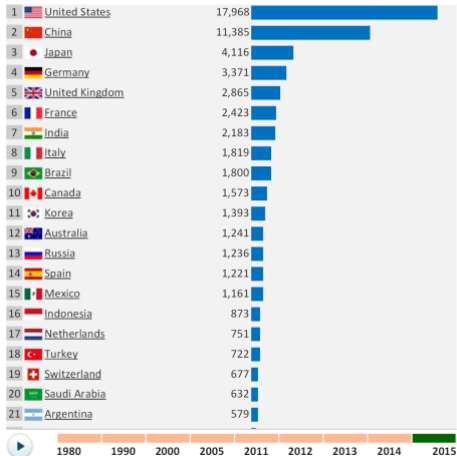
Quick Facts

- Land area: 3,500 mil square miles
- Population: 320 mil people
- ~113 mil households
- ~27 mil firms

- GDP: \$18.50 trillion (in 2016 USD)
- GDP per capita: \approx \$55,000 (in 2016 USD)
- Gross Domestic Product (GDP): the quantity of goods and services produced within a country's borders over a particular period of time

GDP

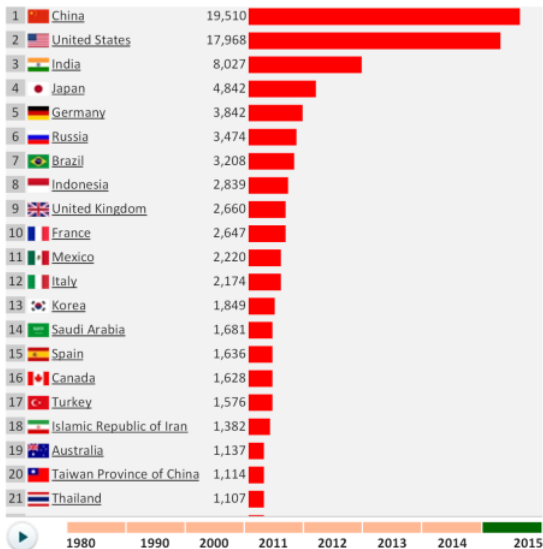
GDP, current prices (billion USD)



Source: [IMF World Economic Outlook \(WEO\), October 2015](#)

GDP - Purchasing Power Parity (PPP) Adjusted

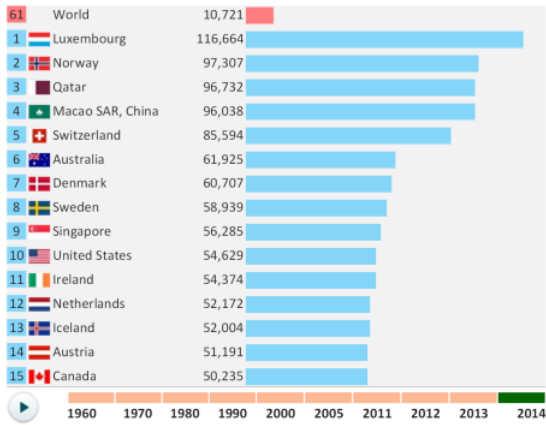
GDP based on PPP valuation (billion current international dollars)



GDP - Per Capita

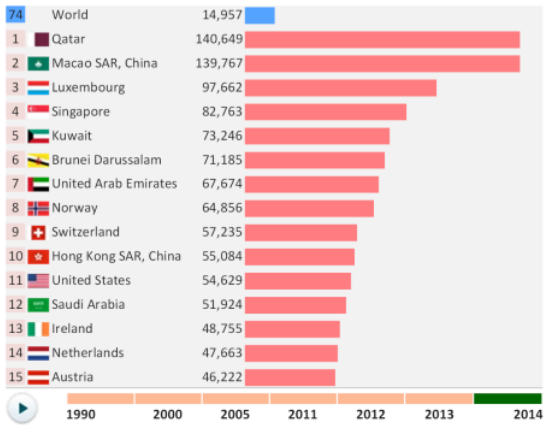
GDP per capita, current prices

US dollars per capita

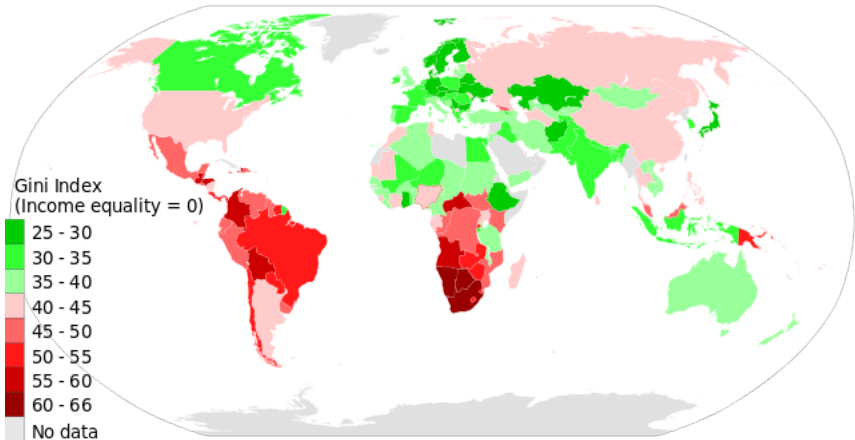


GDP - Per Capita PPP Adjusted

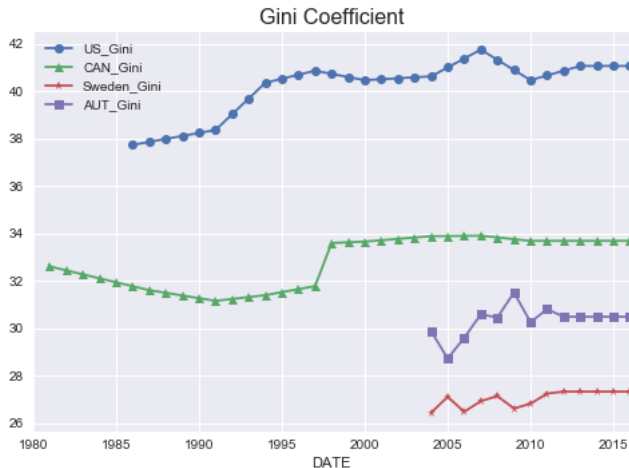
GDP per capita based on PPP *current international \$*



Gini Index



Gini Index



Aggregate Variables

Figure 2: Per Capita Real GDP (2000 USD)

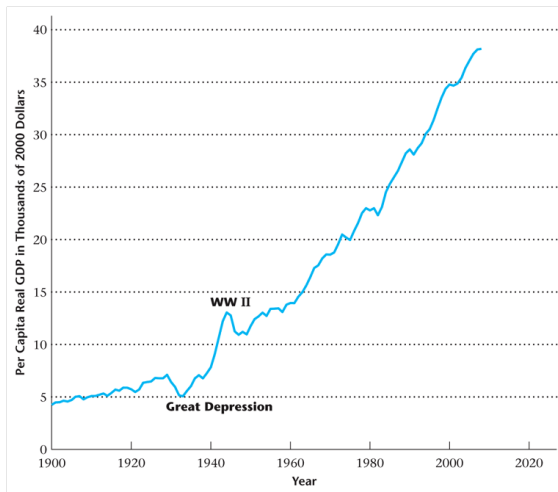
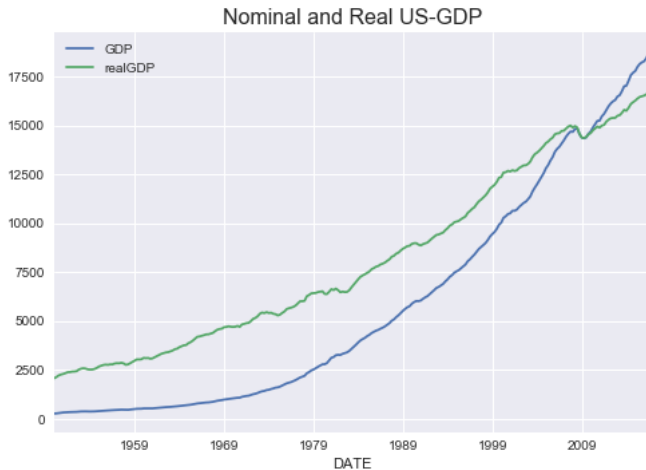
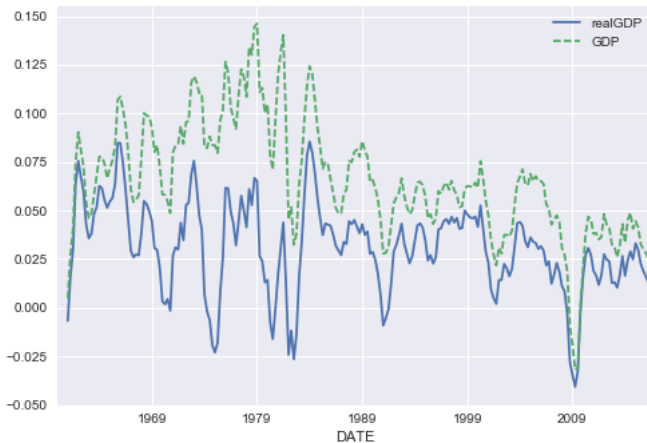


Figure 3: Real GDP (2009 USD)



U.S. GDP Annual Growth Rates



Note: Base year for real GDP is 2009

Figure 4: GDP and Consumption (2009 USD)

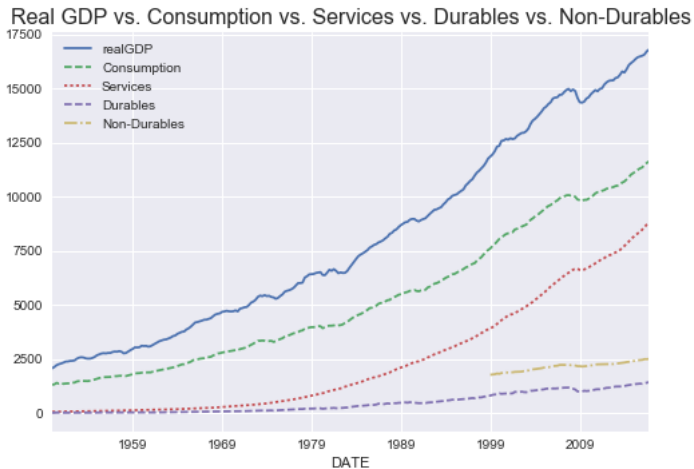


Figure 5: Growth Rates of GDP vs. Personal Consumption

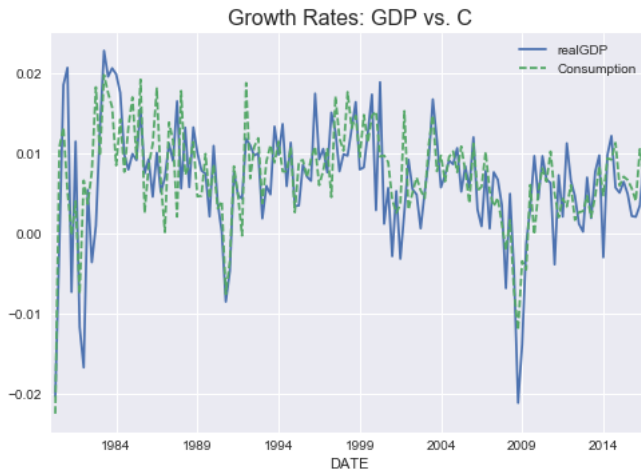


Figure 6: Growth Rates of Real GDP and Non-Durables Consumption

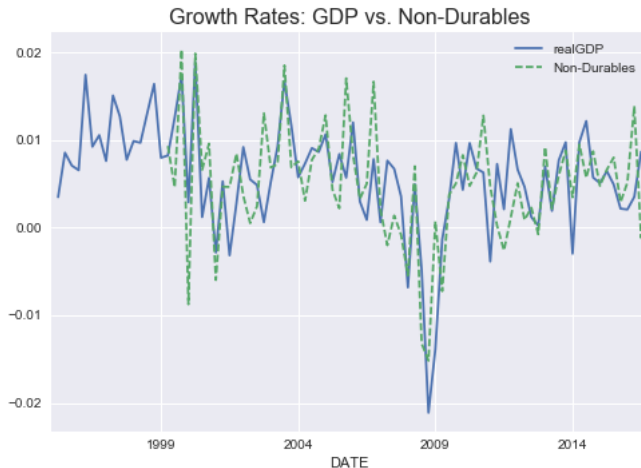


Figure 7: Growth Rate GDP vs. Consumption of Clothing/Shoes

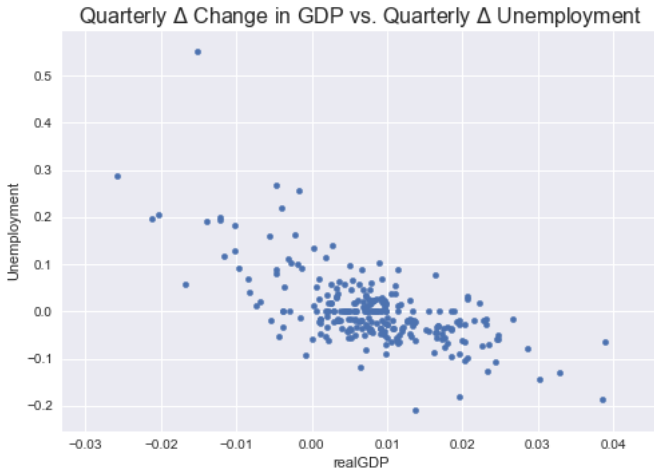


Key Macroeconomic Facts

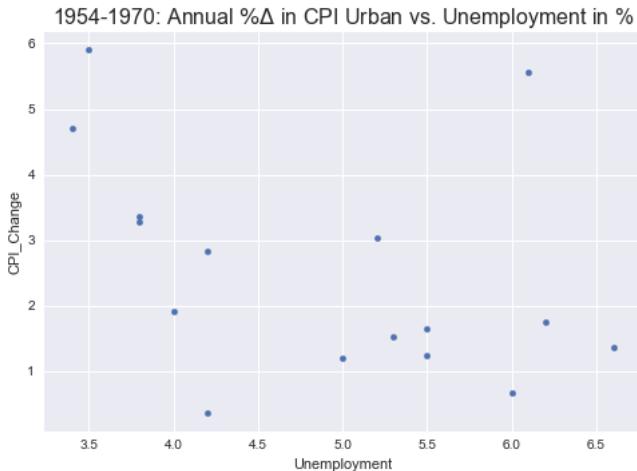
- Fact 1: Upward exponential trend
 - Between 1900 and 2002, average income increased eight-fold
 - Long-run growth
- Fact 2: Fluctuations around long term growth trend
 - Short-run cyclical components
 - Business cycle
- There exist stable, quantitatively accurate relations among aggregate variables

A Stable Relationship?

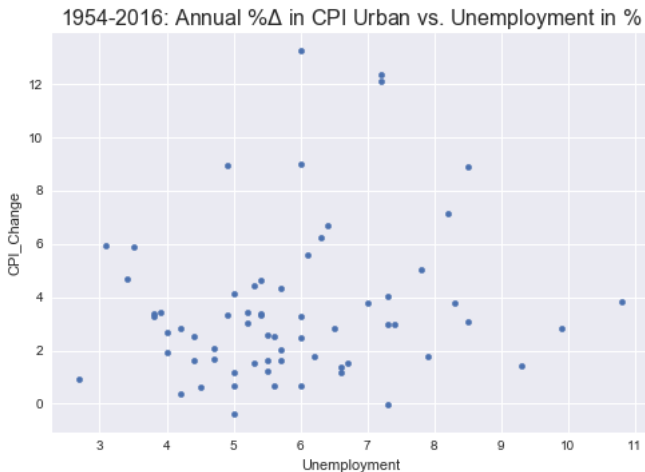
Figure 8: Okun's Law



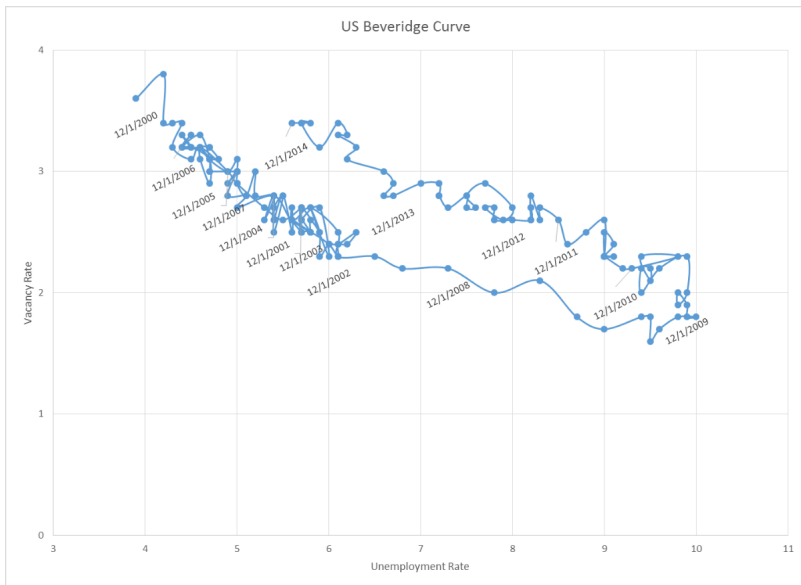
Original Phillips Curve: 1954-1970



Phillips Curve: 1954-2013

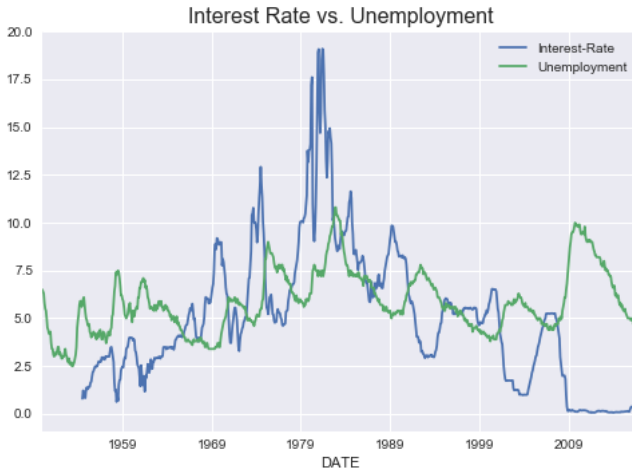


Beveridge Curve



A Stable Relationship?

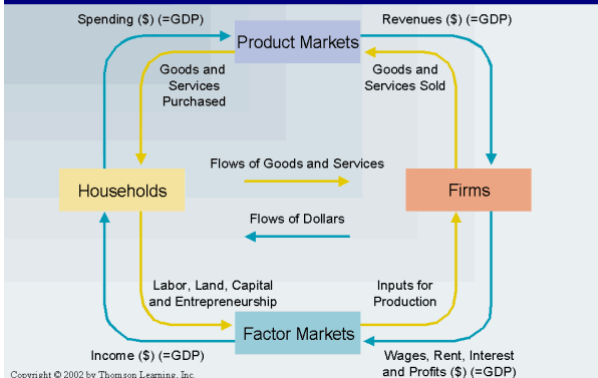
Figure 9: Interest Rates and Unemployment



A Macroeconomic Model

Model

The Circular Flow Model of Income and Output



Some fundamental macro questions

- 1 What causes sustained economic growth?
- 2 Is economic growth indefinite *i.e.* limit to growth?
- 3 Can governments (policymakers) alter the rate of growth?
- 4 What causes business cycles?
- 5 Can the booms (expansions) and busts (recessions) be repeated?
- 6 Should governments (policymakers) smooth business cycles?

Recessions

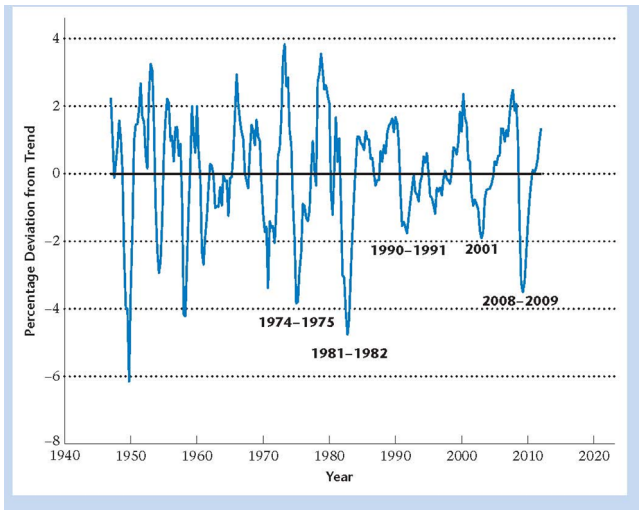
- 1 1974 – 1975: Oil price shock caused by OPEC restrictions
- 2 1981 – 1982: Fight inflation using monetary policy i.e. high interest rates (Volcker rule)
- 3 1990 – 1991: Gulf War, oil price high again
- 4 2001: Burst of Dot.com bubble and loss of optimism → start of housing bubble (Greenspan rule)
- 5 2008 – 2009: Burst of Housing bubble and financial crisis

1982 – 2008: The Great Moderation → macro aggregates become less volatile

Figures

Figures (cont.)

Figure 10: Percentage Deviation from Trend in Real GDP, 1947-2009



Figures (cont.)

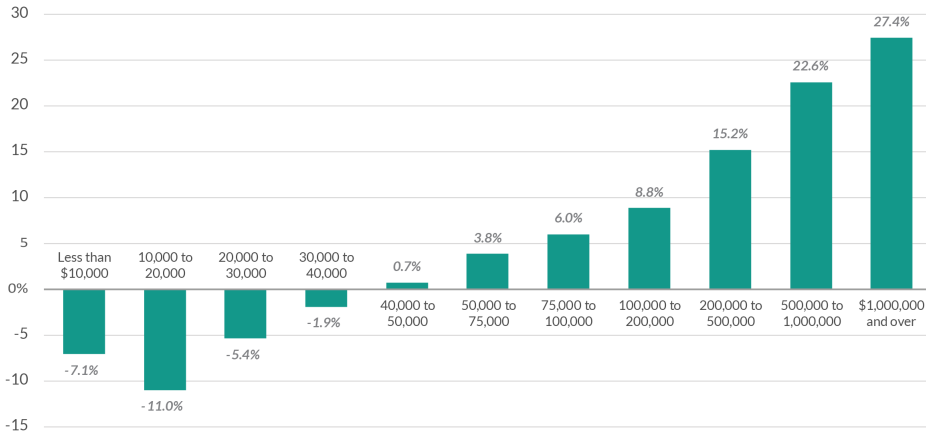
Figure 11: Total Taxes and Total Government Spending



Figures (cont.)

The Income Tax System is Progressive

Average Federal Individual Income Tax Rate by Income Group



Source: Joint Committee on Taxation

Appendix

How to Measure Growth

- Consider a time series $y_0, y_1, \dots, y_{t-1}, y_t, \dots, y_T$
- Let y_t denote GDP in time period t i.e. US GDP 10 trillion in year t .
- Growth rate is the rate of change (Discrete vs. Continuous). The discrete rate of change is:

$$g_t = \frac{y_t - y_{t-1}}{y_{t-1}} = \frac{y_t}{y_{t-1}} - 1$$

so that

$$1 + g_t = \frac{y_t}{y_{t-1}}$$

How to Measure Growth (cont.)

- Note: If x is small then $\log(1 + x) \approx x$. So, if g_t is small then:

$$\log(1 + g_t) \approx g_t$$

$$\log\left(\frac{y_t}{y_{t-1}}\right) \approx g_t$$

or

$$\log y_t - \log y_{t-1} \approx g_t$$

$$\Delta \log y_t \approx g_t$$

- g_t is the slope of the $\log y_t$ line.
- Can think of growth rates in log as continuous time analogue of discrete approximation

How to Measure Growth (cont.)

- Remember also the definition of log

$$\ln(x) = y \rightarrow e^y = x$$

so that

$$\ln(1) = 0 \rightarrow e^0 = 1,$$

$$\ln(e) = 1 \rightarrow e^1 = e,$$

where e is Euler's constant

$$e = \lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n = 2.71828$$

Figure 16: Natural Log of Per Capita Real GDP

