



# Macro for Policy

Topic 1: Facts on business cycles and growth

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# Agenda

Overview of the UK business cycles and growth:

- Introduction of business cycles.
- Overview of the UK business cycles.
- The facts on economic growth

# Business cycles?

- Economic growth is volatile
- We're not sure why, but we did come up with a name: business cycles
- Burns and Mitchell
  - Fluctuations in aggregate economic activity.*
  - Expansions occur in many economic activities, followed by similarly general recessions, which merge into the next "cycle."*

## Business cycles: Kydland-Prescott

- ▶ In 2004, Finn Kydland and Edward Prescott were awarded the Nobel Prize “for their contributions to dynamic macroeconomics: the time consistency of economic policy and the driving forces behind **business cycles**”.
- ▶ In his Nobel lecture, Prescott explains what is business cycle, how to measure it and how to explain it.

## Kydland-Prescott (cont.)

- ▶ “Business cycles are fluctuations in output and employment about *trend*.”
- ▶ Output is a measure of the aggregate economy.
- ▶ In other academic paper, he says “we follow Lucas in defining the business cycle phenomena as the recurrent fluctuations of output about a trend and the co-movements among other aggregate time series”.
- ▶ The trend is defined using an algorithm, the Hodrick and Prescott filter. The algorithm aims at drawing a smooth trend such as:

## Trends and Fluctuation

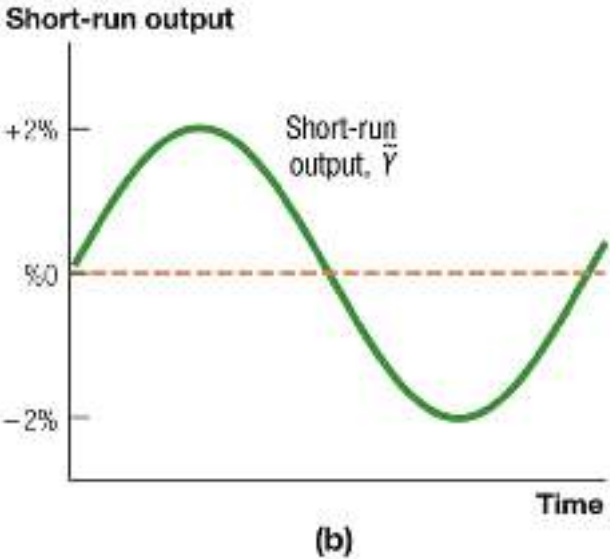
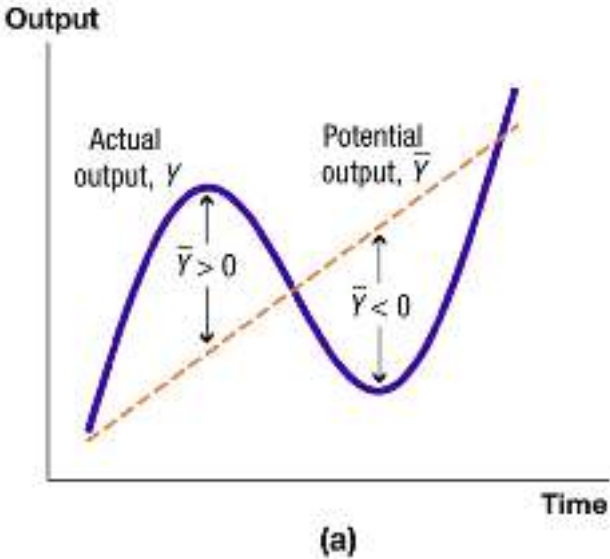
- Output is equal to the long-run trend plus short-run fluctuations:

$$\underbrace{\text{actual output}}_{Y_t} = \underbrace{\text{long-run trend}}_{\bar{Y}_t} + \underbrace{\text{short-run fluctuations}}_{\tilde{Y}_t}$$

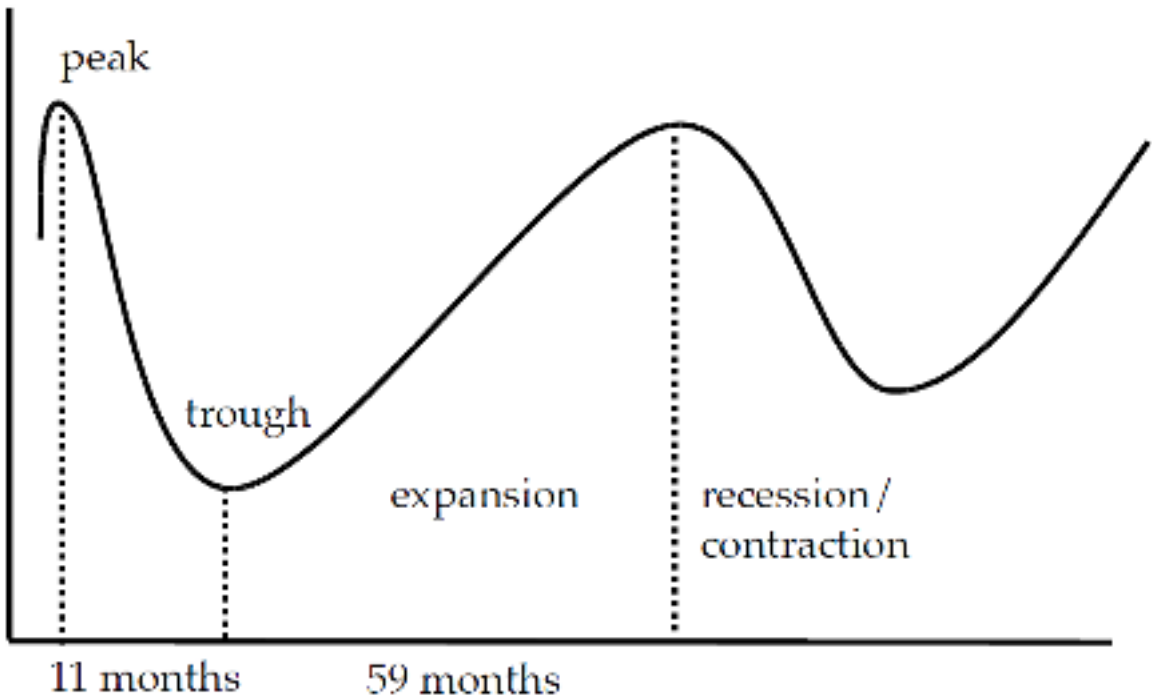
- The long-run trend is sometimes referred to as “potential output”
- The short-run fluctuations are the percentage deviations from long-run trend GDP
  - The difference in actual GDP and trend GDP, expressed as a percentage of trend GDP
  - Referred to as “detrended output” or short-run output

$$\frac{\tilde{Y}_t}{\bar{Y}_t} = \frac{Y_t - \bar{Y}_t}{\bar{Y}_t} \approx \ln Y_t - \ln \bar{Y}_t$$

# Business Cycles

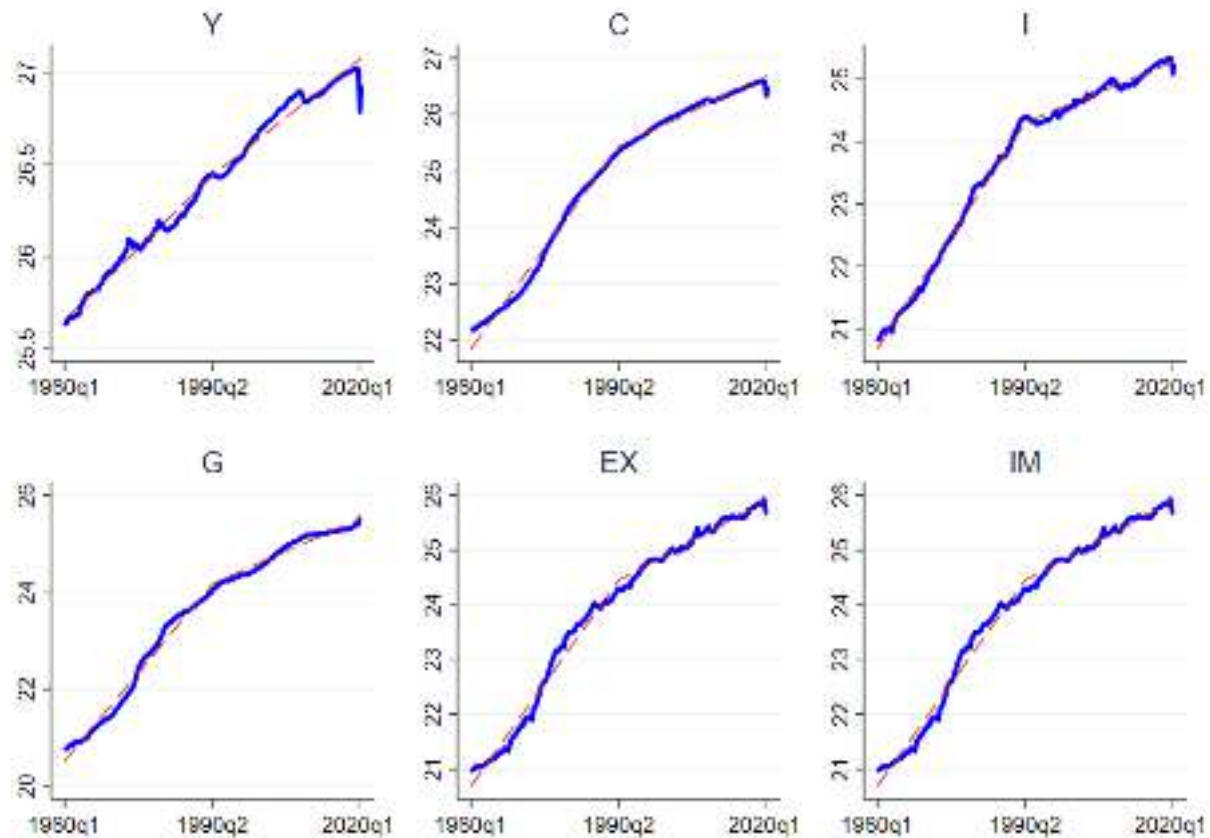


# Business cycle terminology

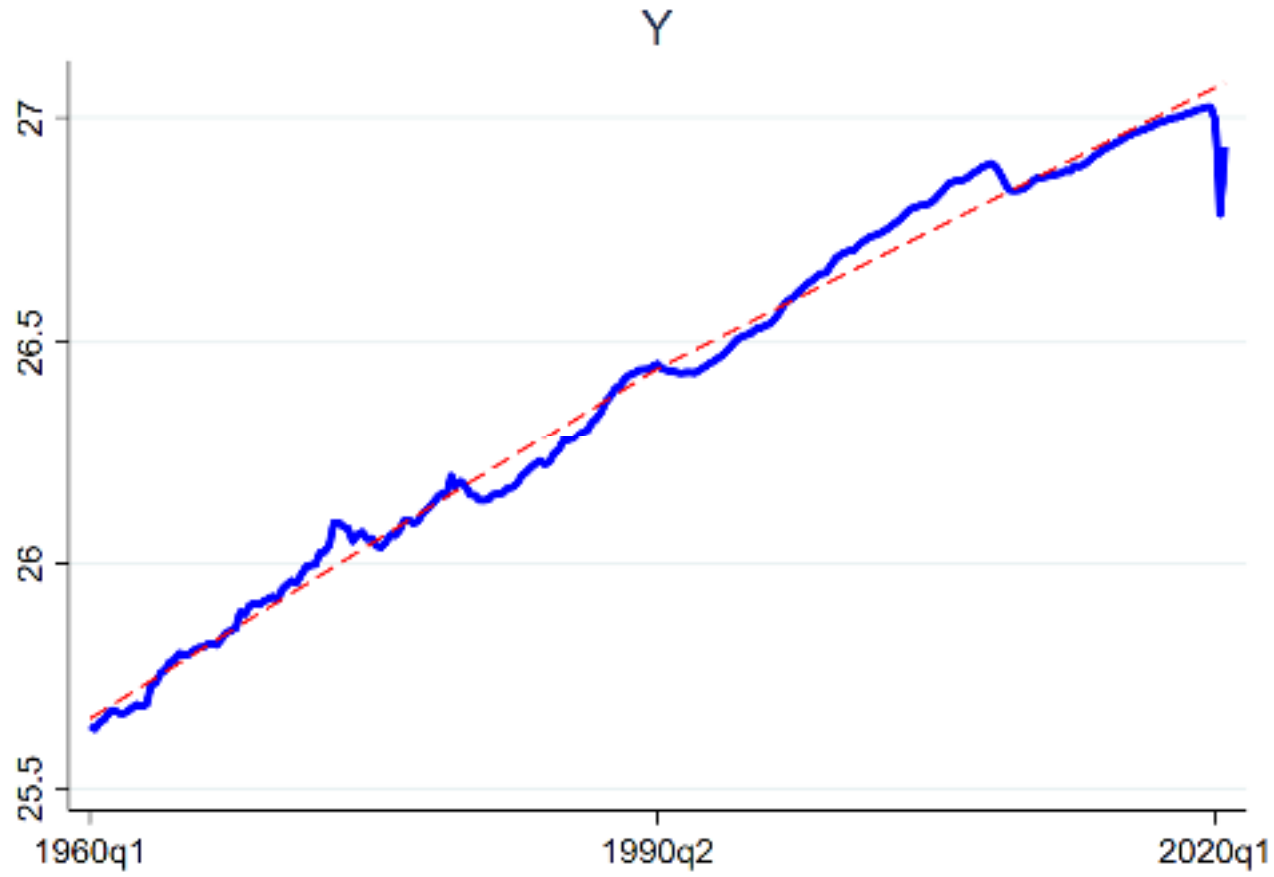




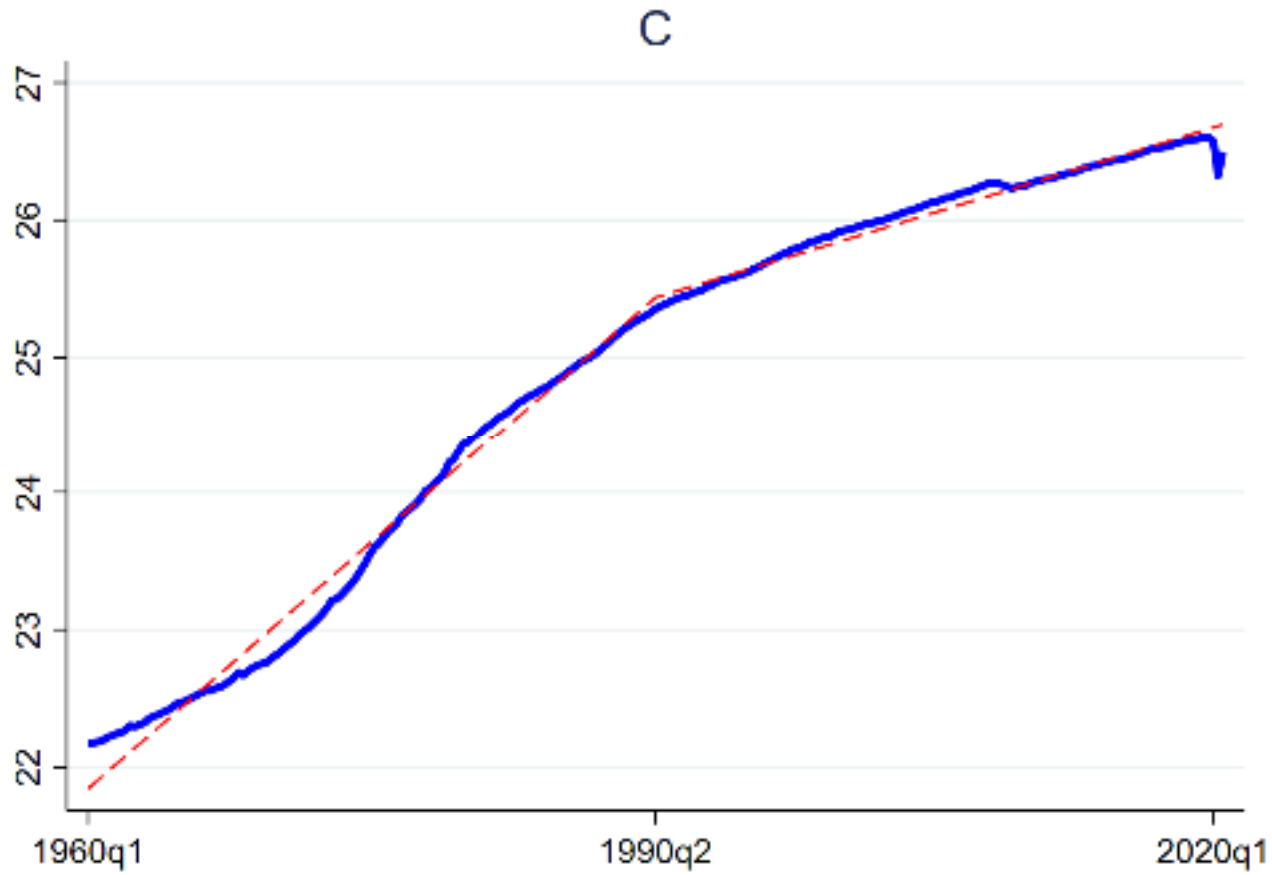
## Aggregate variables all sample periods



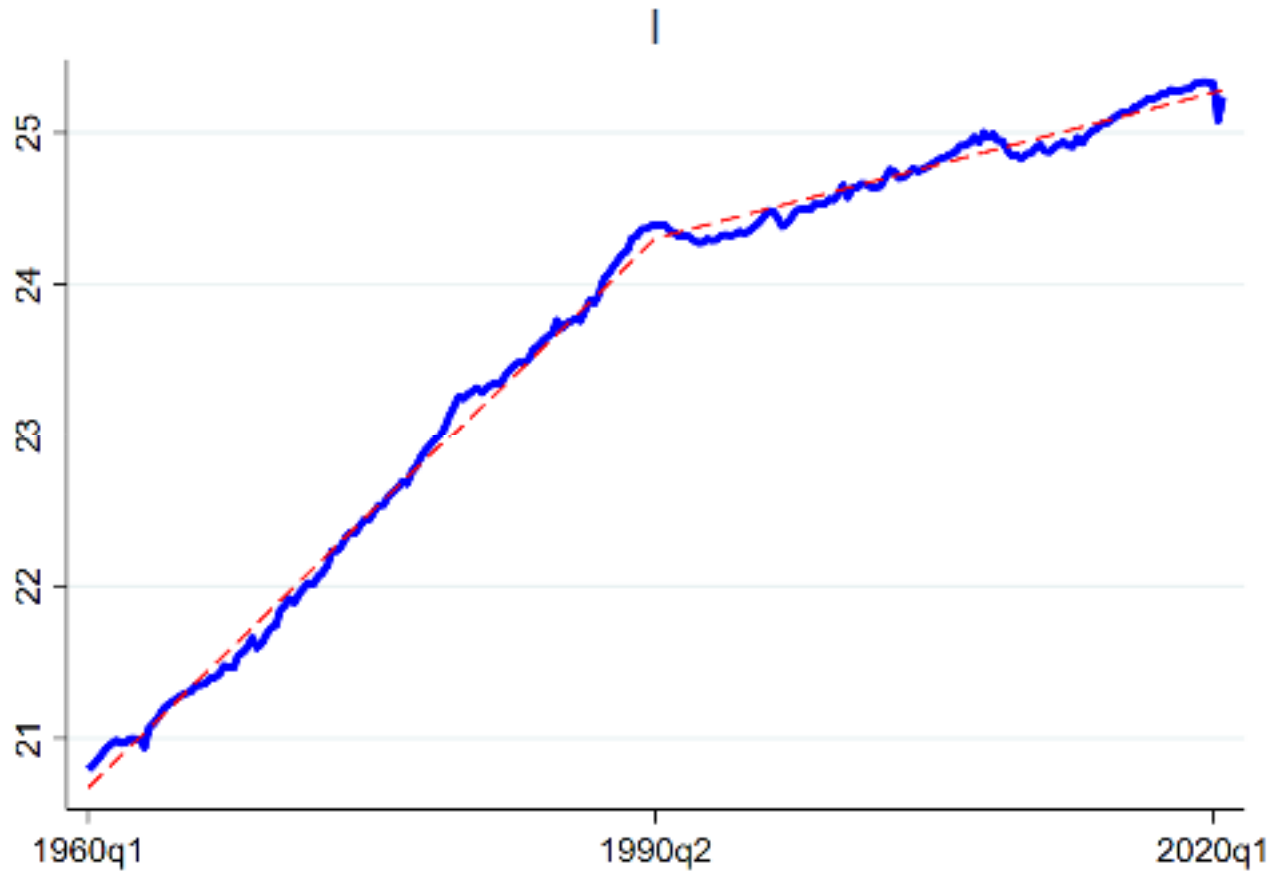
# GDP



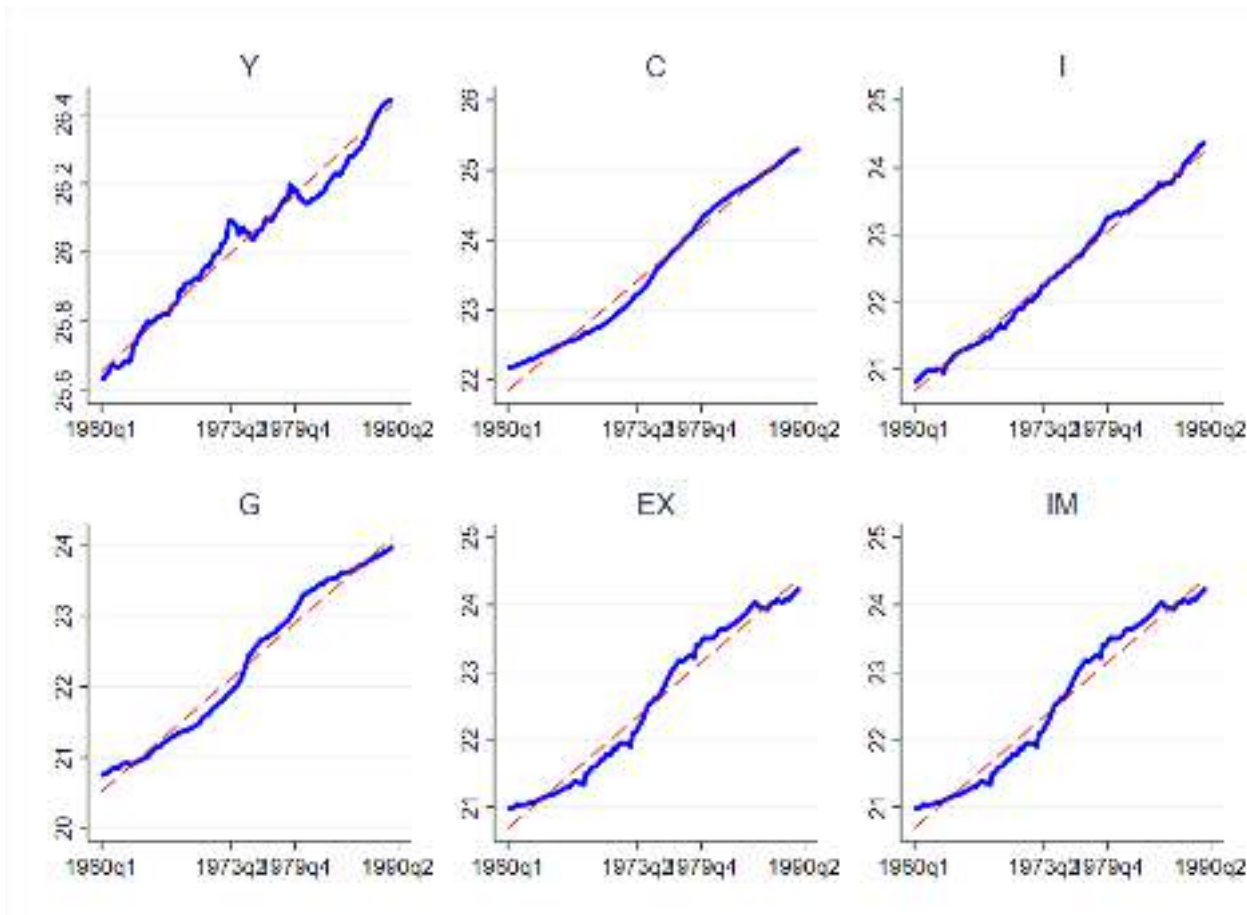
# Consumption



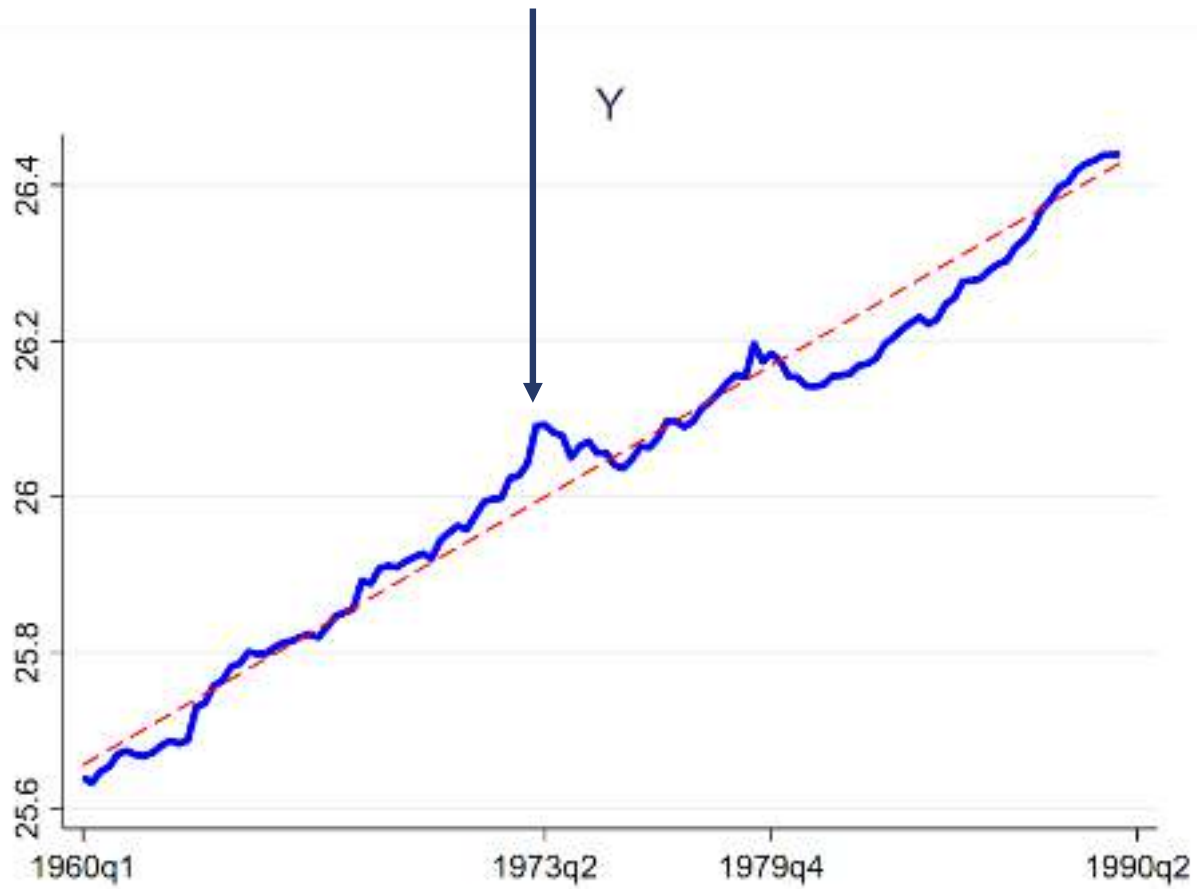
# Investment



## Pre-1990



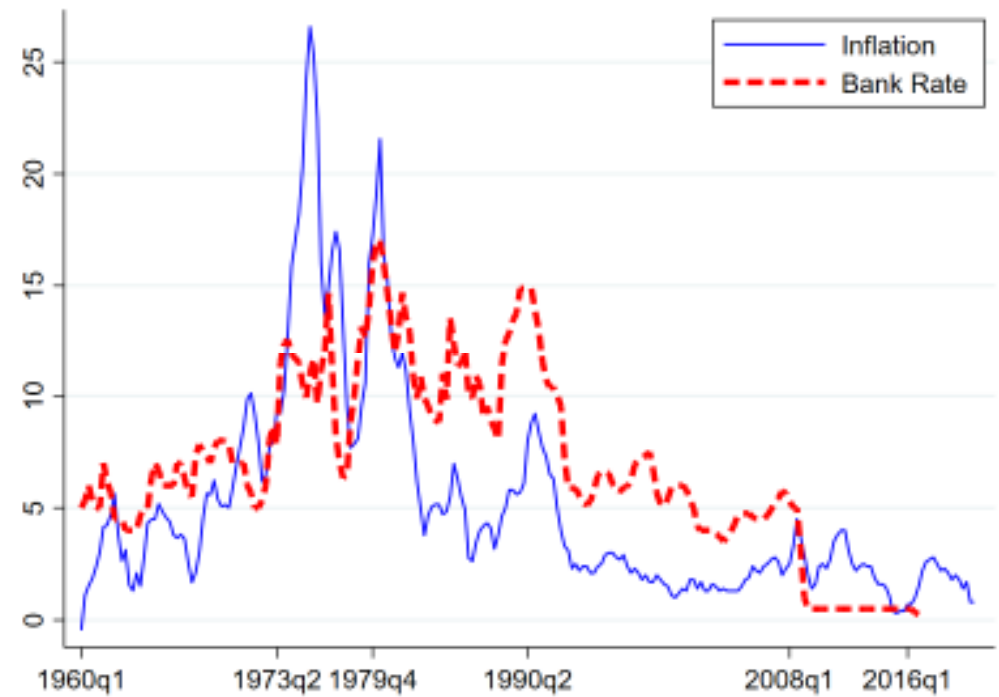
## GDP Pre-1990



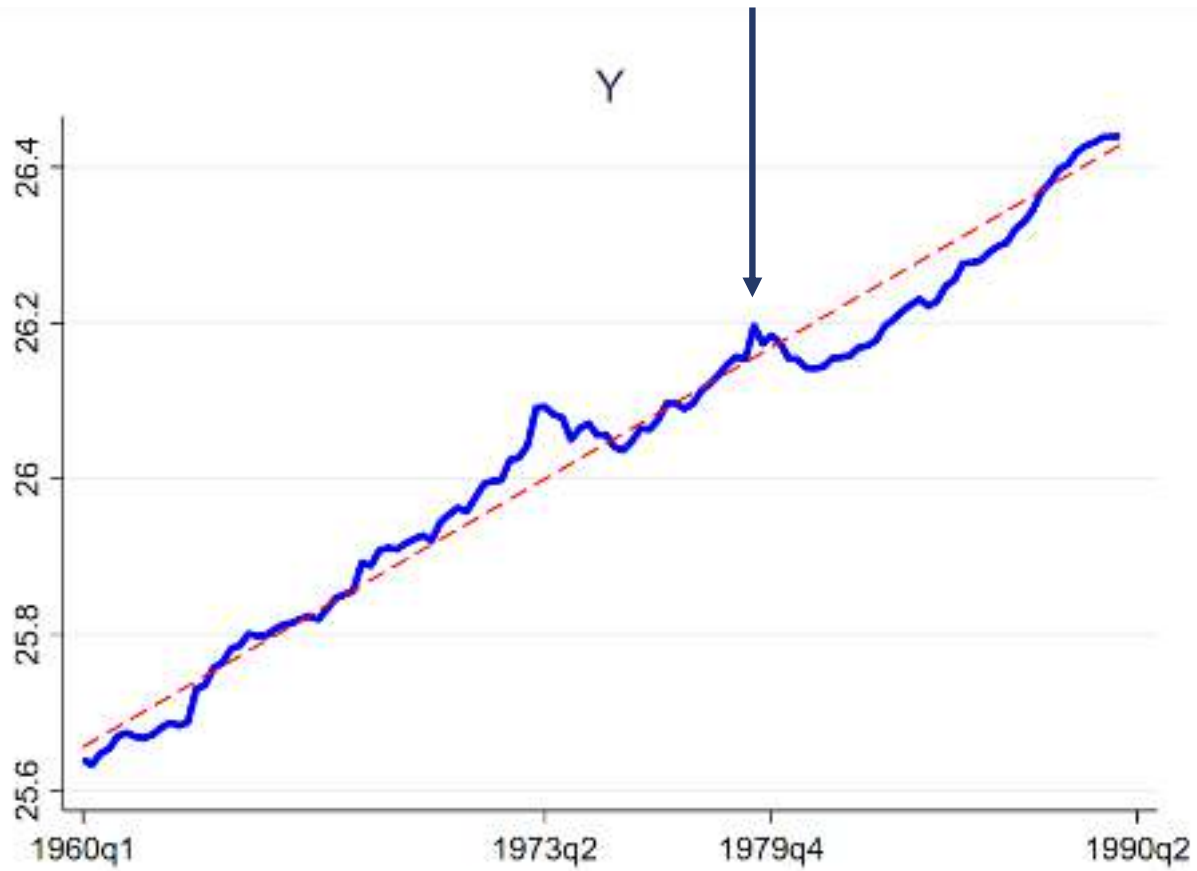
## 1973 recession: the oil crisis and strike by mineworkers



▲ Office workers in London attempt to keep warm during the 1974 power cuts. Photo credit: Reuters/Solidarity/Getty Images



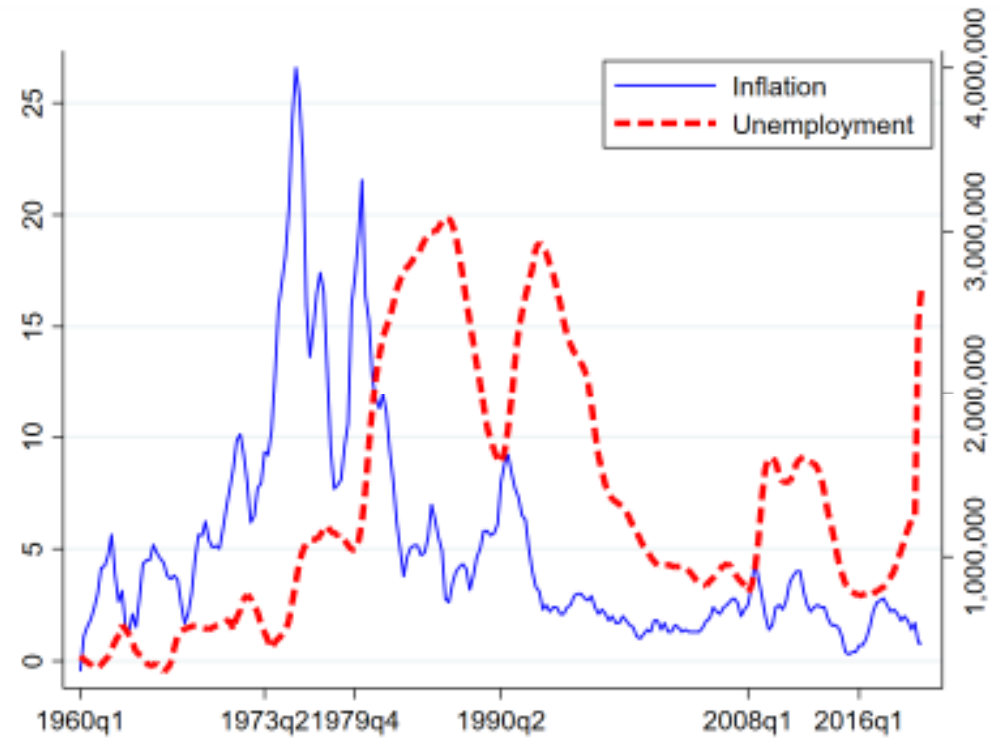
## GDP Pre-1990



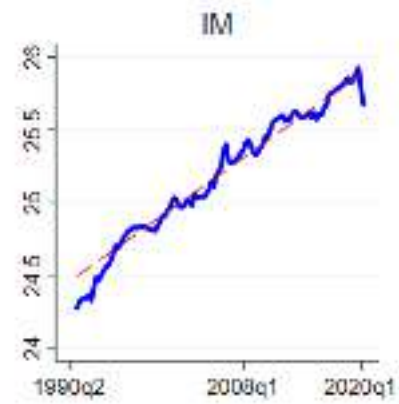
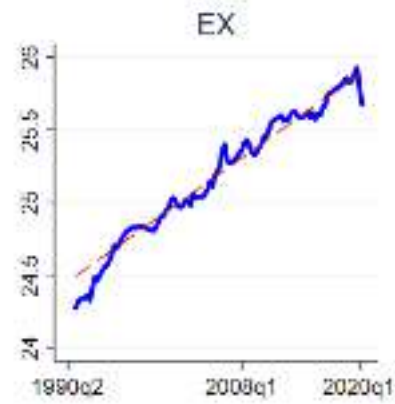
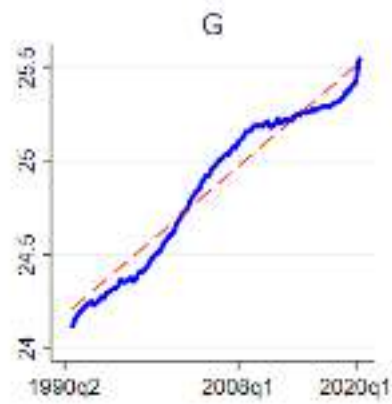
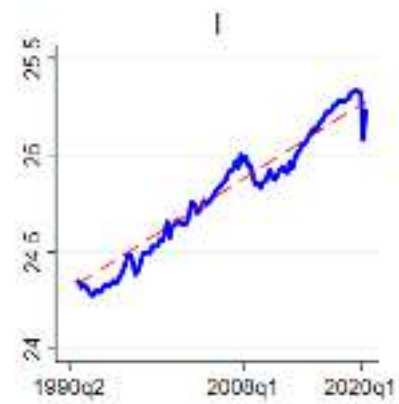
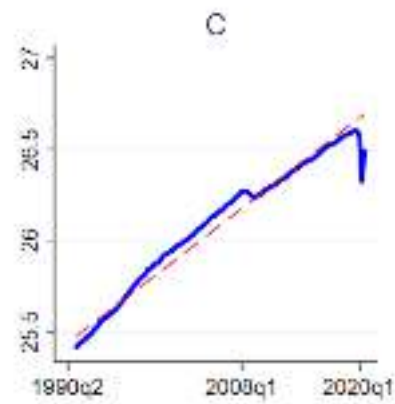
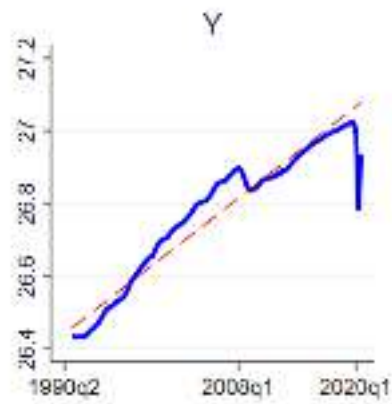


# 1980 recession: oil prices, strike and inflation

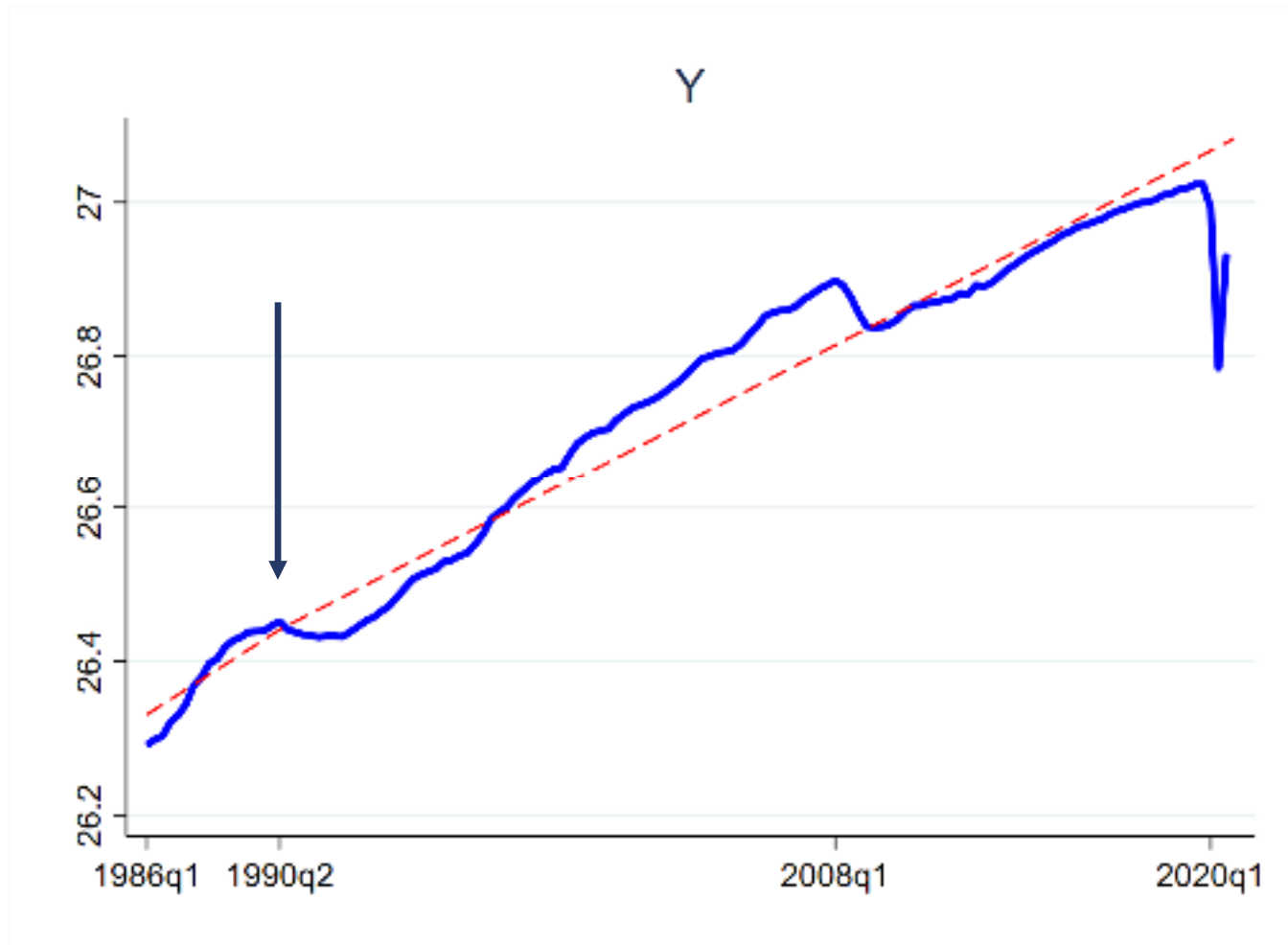
## 1978-1979: Winter of discontent



## Post-1990



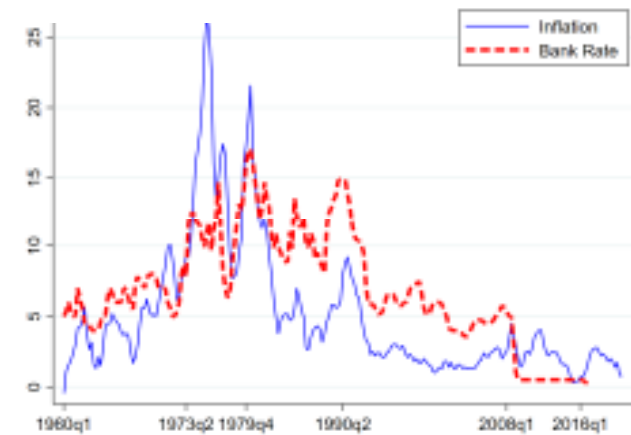
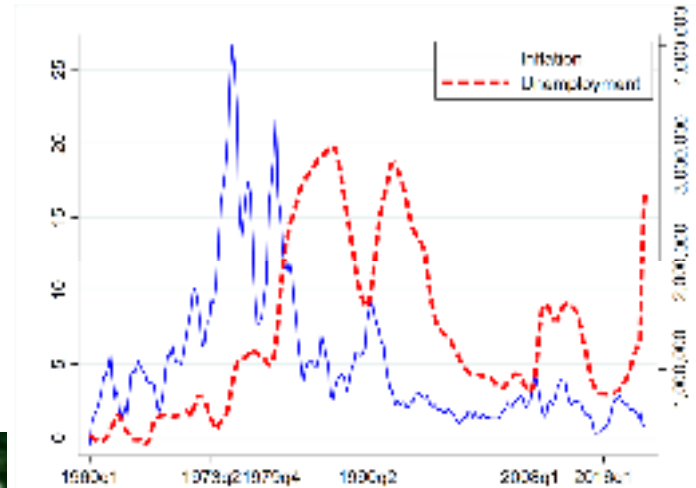
## GDP Post-1990



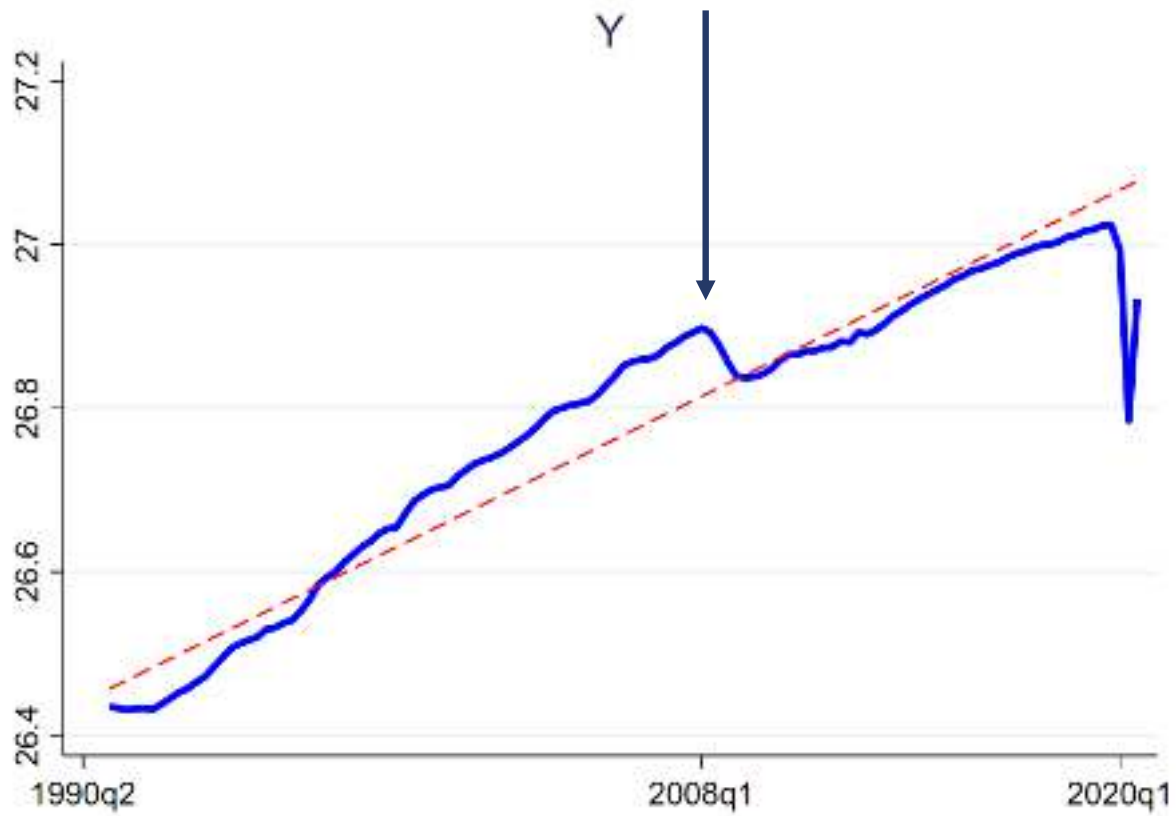
# 1990 recession: Lawson boom and bust, Black Wednesday



John Major's Government, the ground the financial of Black Wednesday (Image: GETTY)



## GDP Post-1990

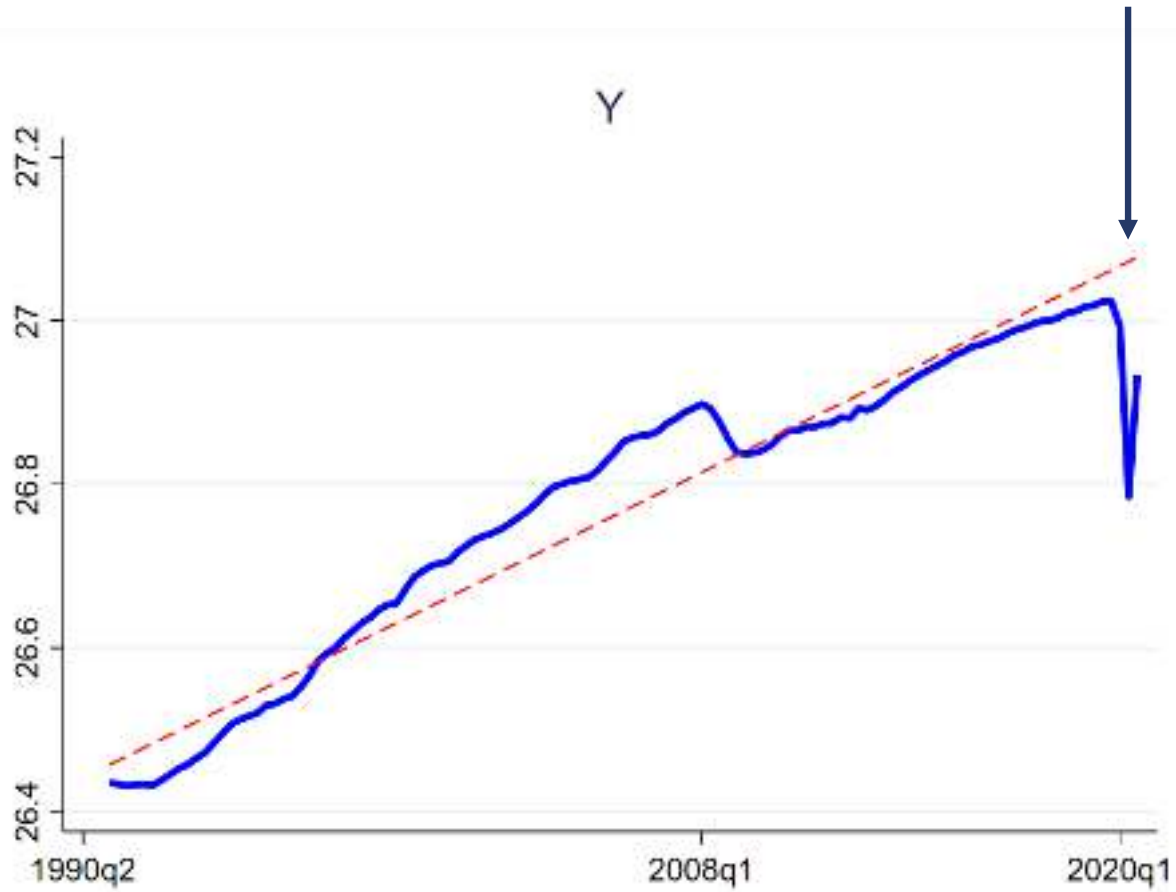


# Great Recession and Eurozone crisis

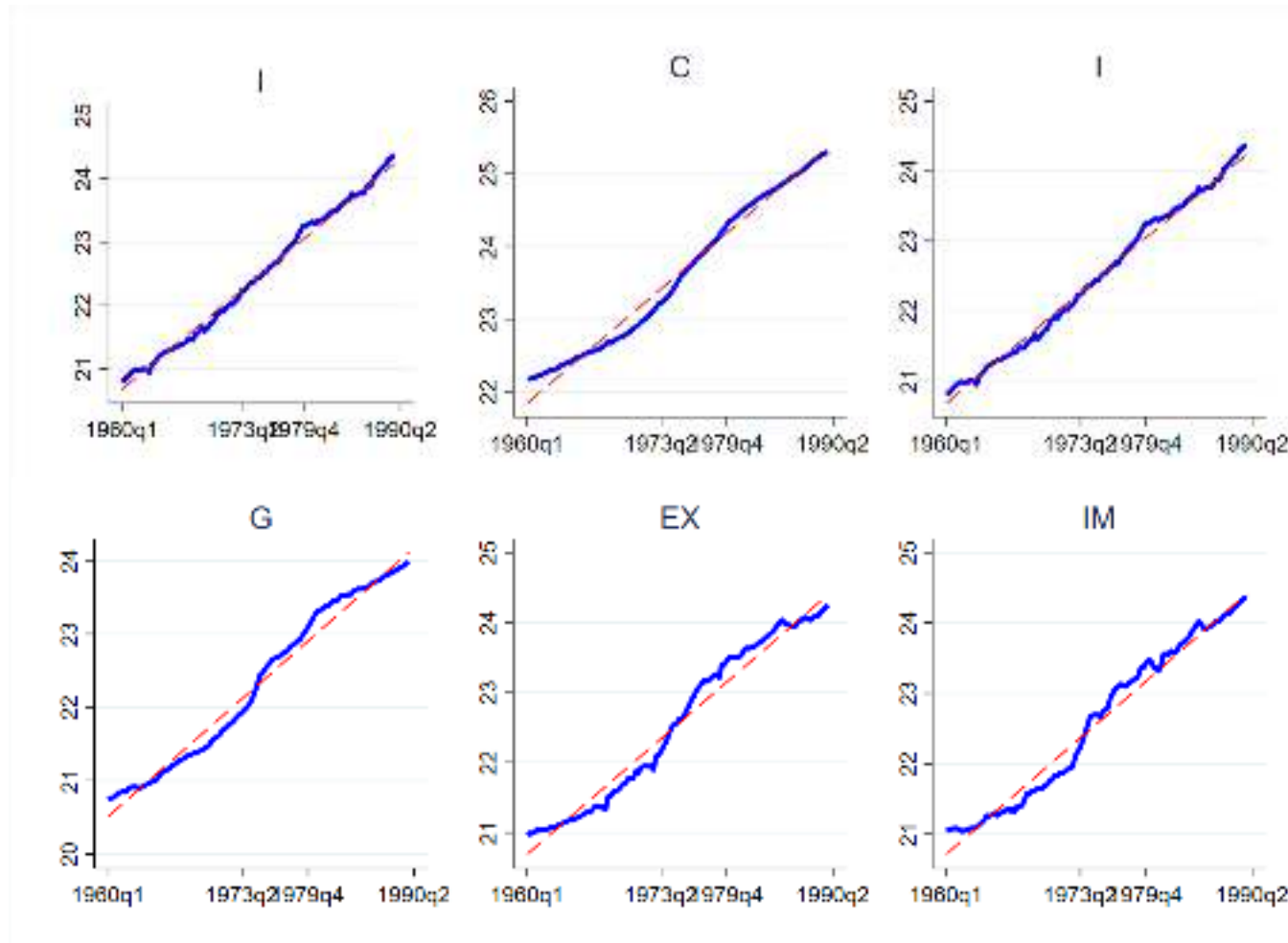


Reporting from Lehman, July 2008

## GDP Post-1990

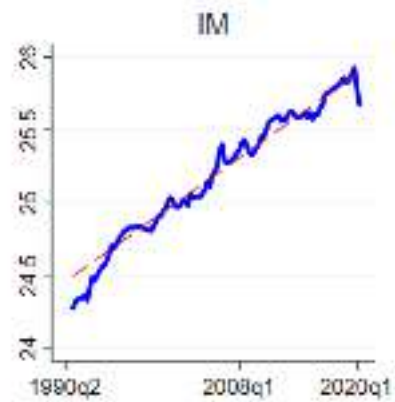
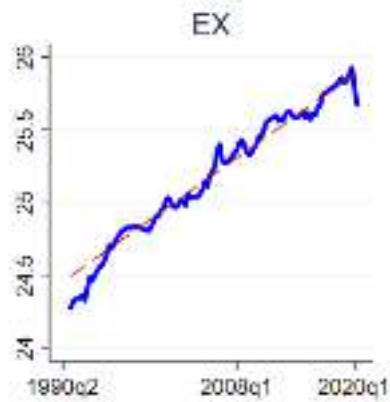
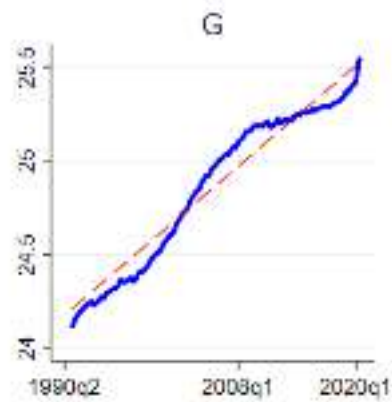
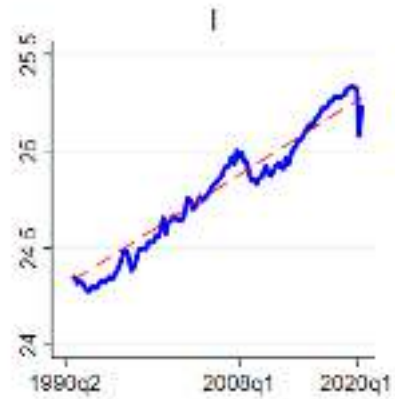
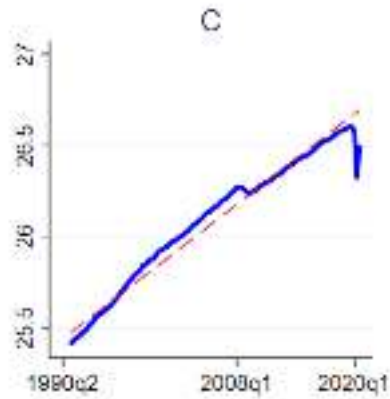
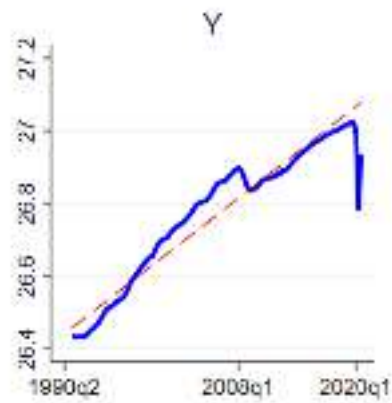


## Before detrending: pre 1990

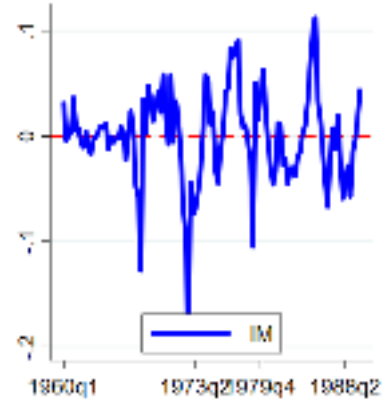
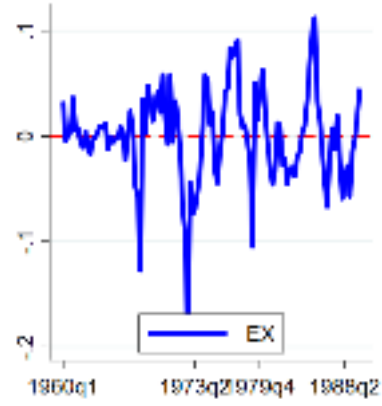
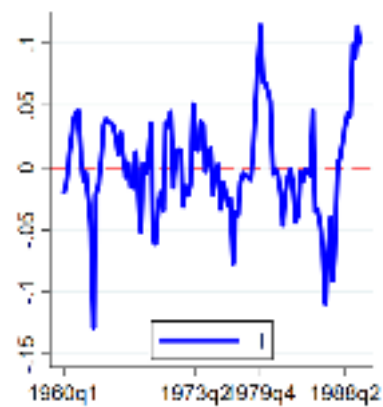
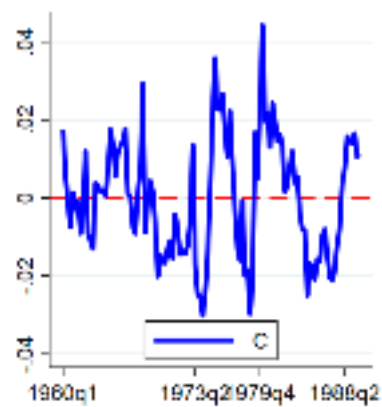
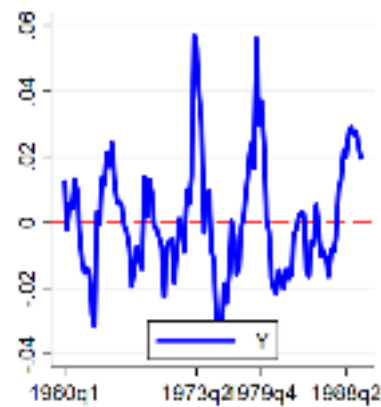




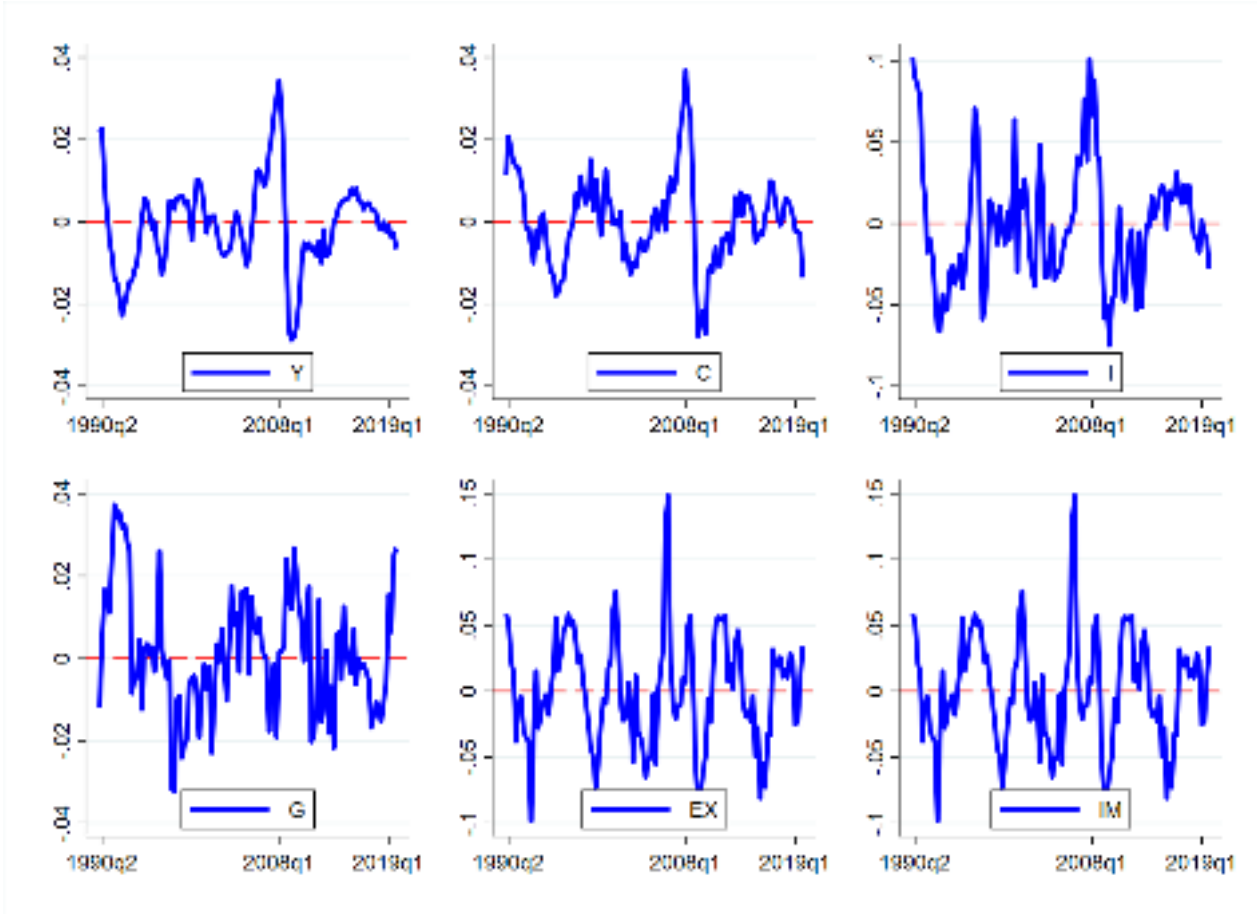
## Before detrending: post 1990



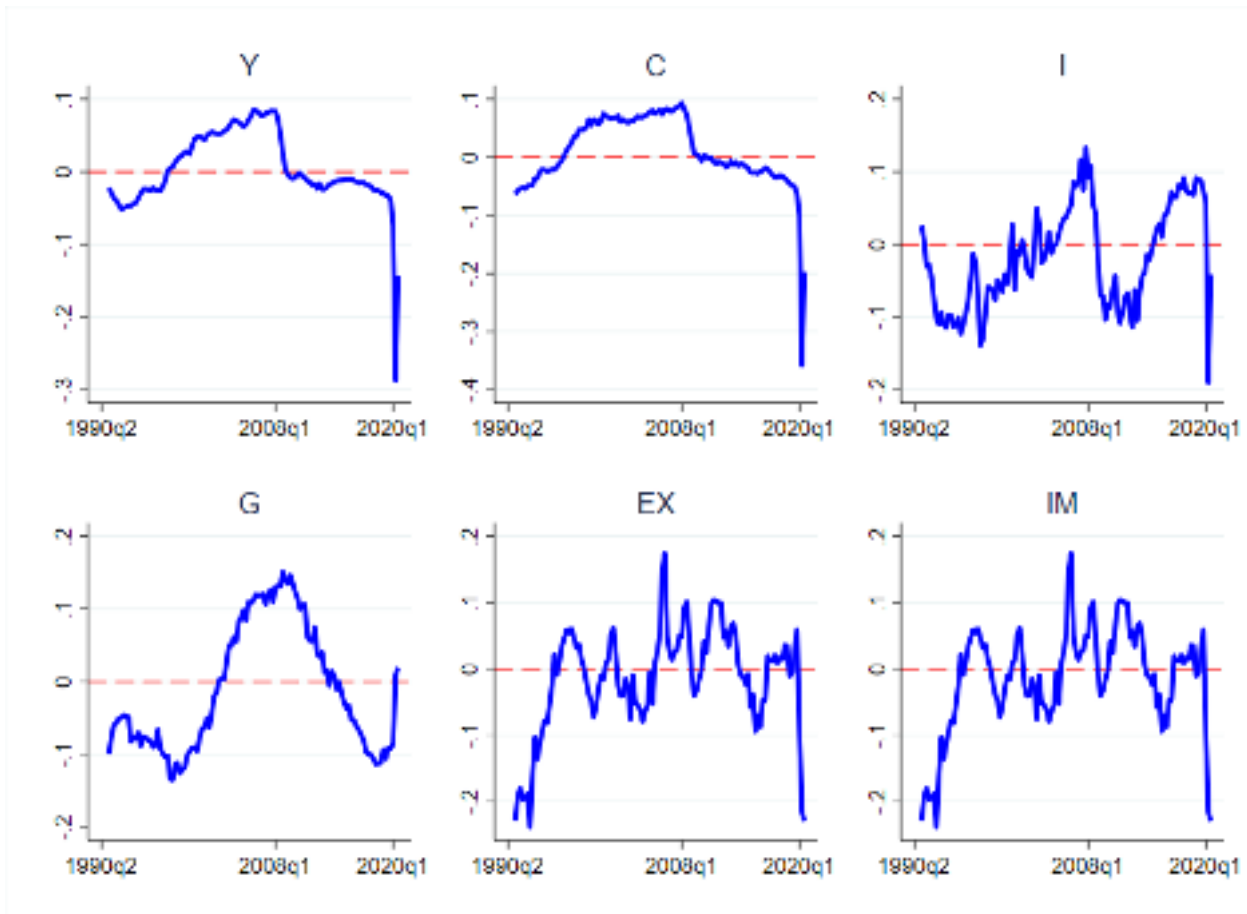
## After detrending: pre 1990



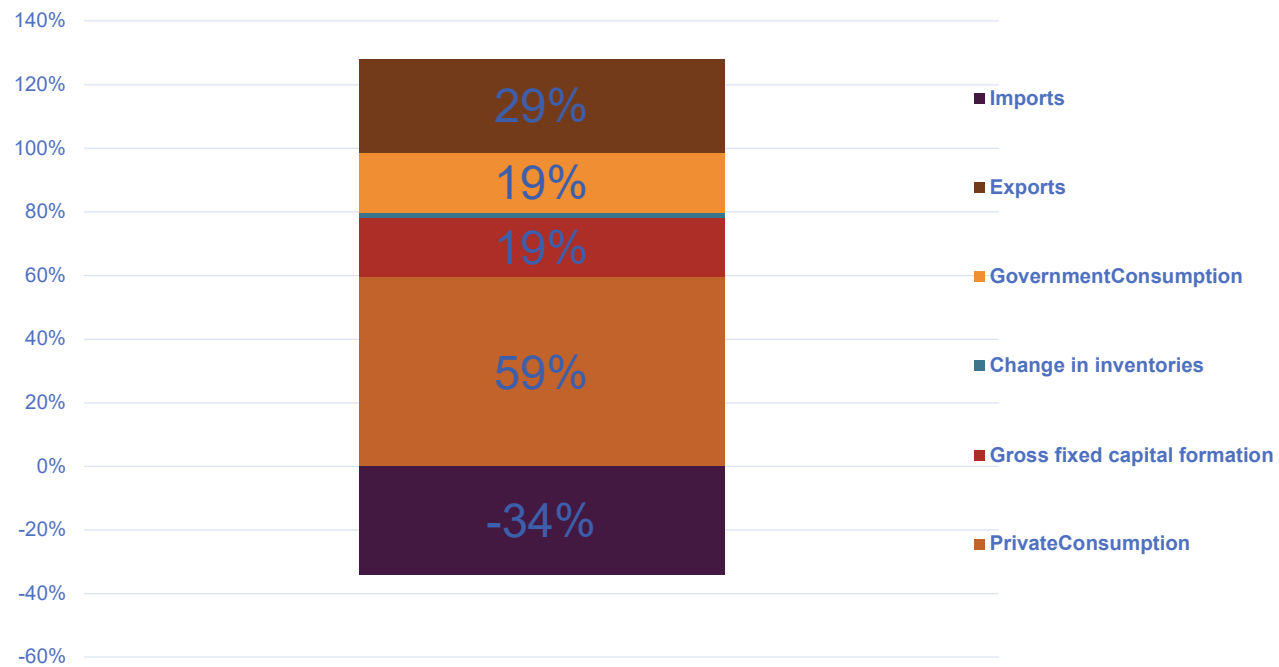
# After detrending (excluding Covid): post 1990



## After detrending (including Covid): post 1990



# GDP expenditure components (2019 Q1)



## Business cycle statistics

Standard deviation of HP-filtered series:

- GDP: 1.49
- Consumption: 1.32
- Investment: 3.96
- Government consumption: 2.83
- Exports: 4.31
- Imports: 5.10

## Business cycles in the UK

- There appears to be a downward shift around 1990 in the trend of the UK economy.
- GDP has been below the trend since the Great Recession.
- Five major recessions, including the current one with the Covid pandemic, in the UK since 1970.
- The largest component of the GDP is consumption (59%), which is also the most stable one.
- Investment and Export/Import are volatile.

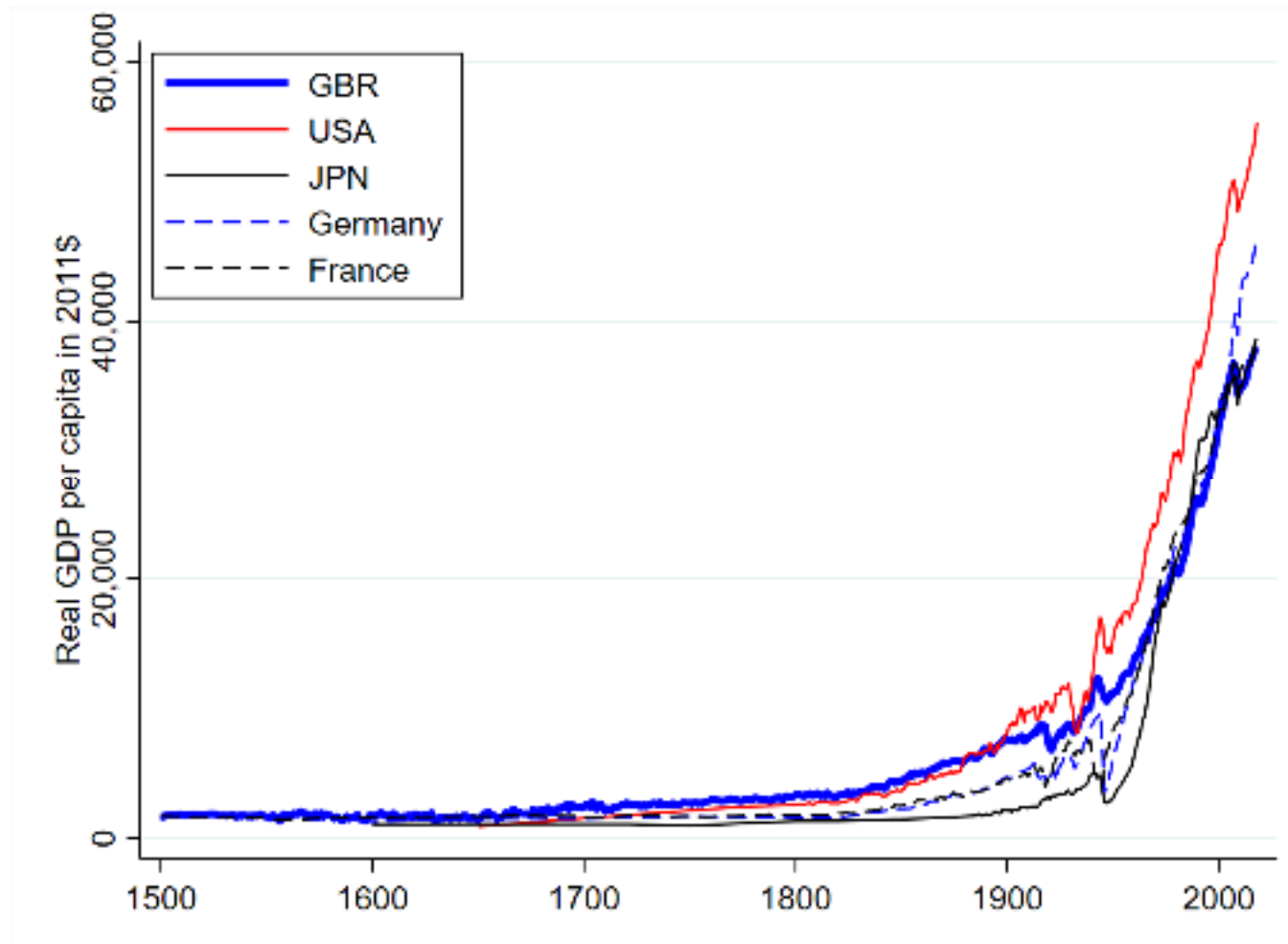
# Economic growth?

What causes economic growth?

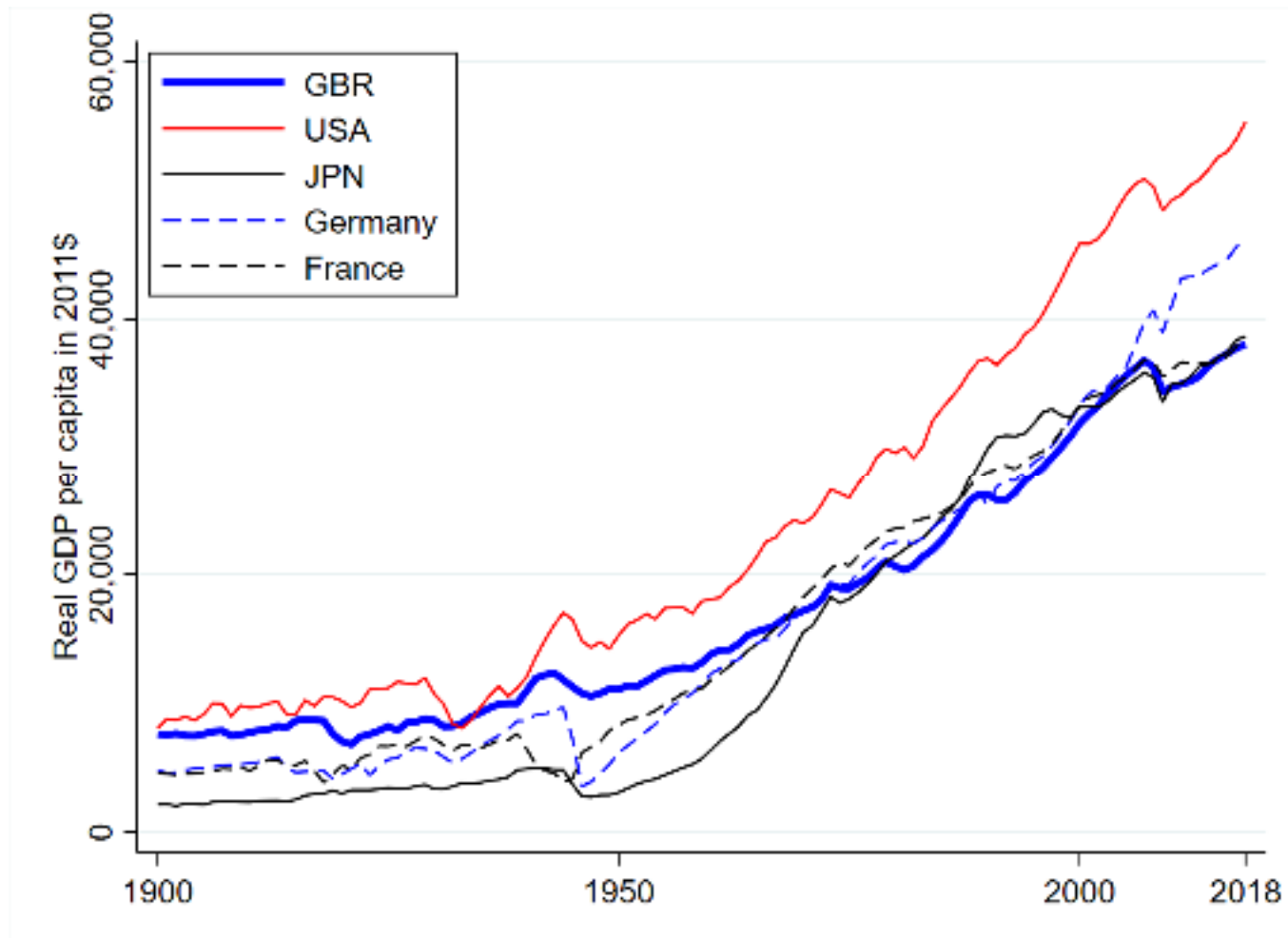
- Paul R. Krugman, *The Age of Diminished Expectations* (Cambridge: MIT Press, 1994).  
“Productivity isn't everything, but in the long run it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.”



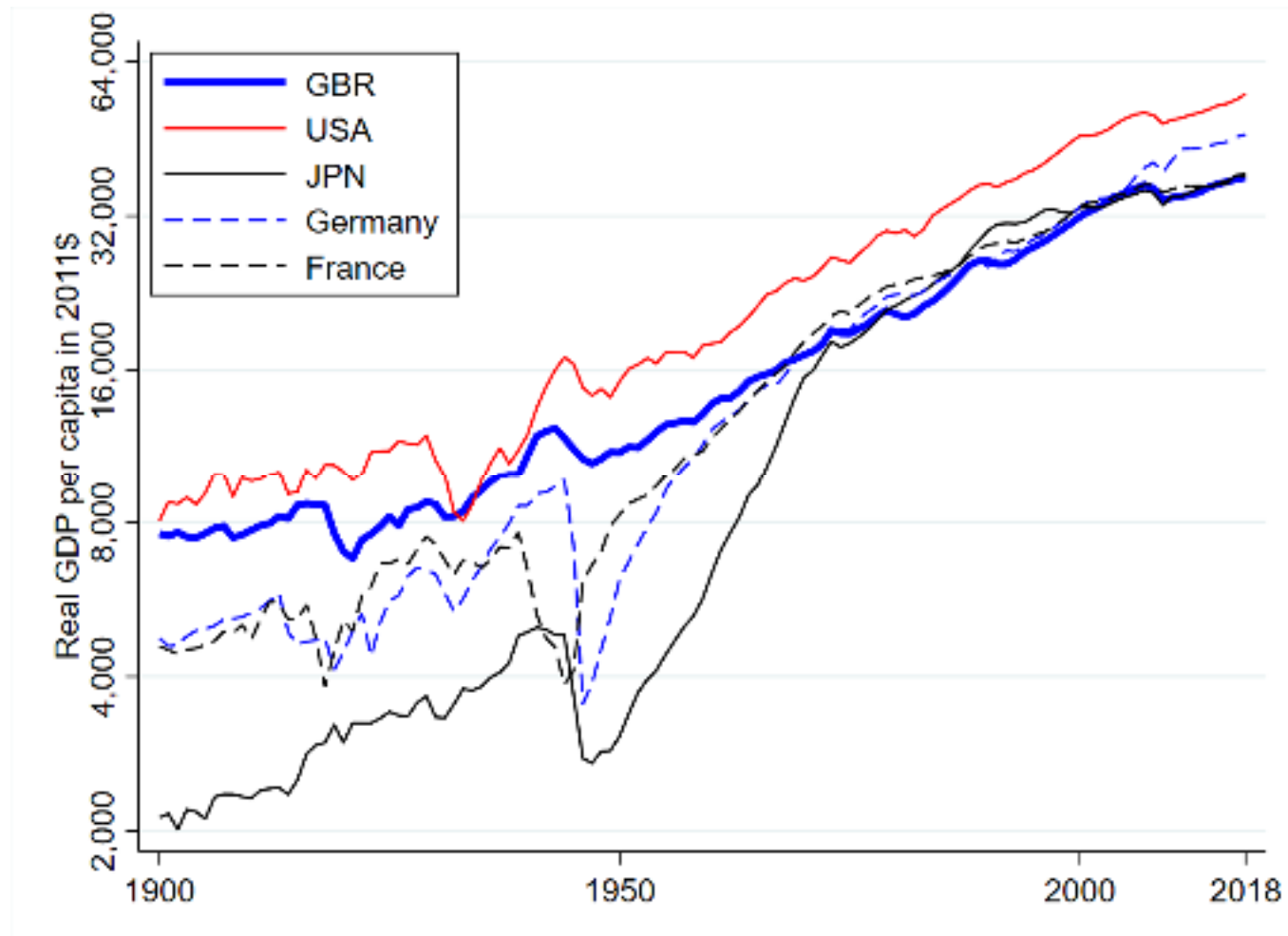
## Real GDP per capita: all sample periods



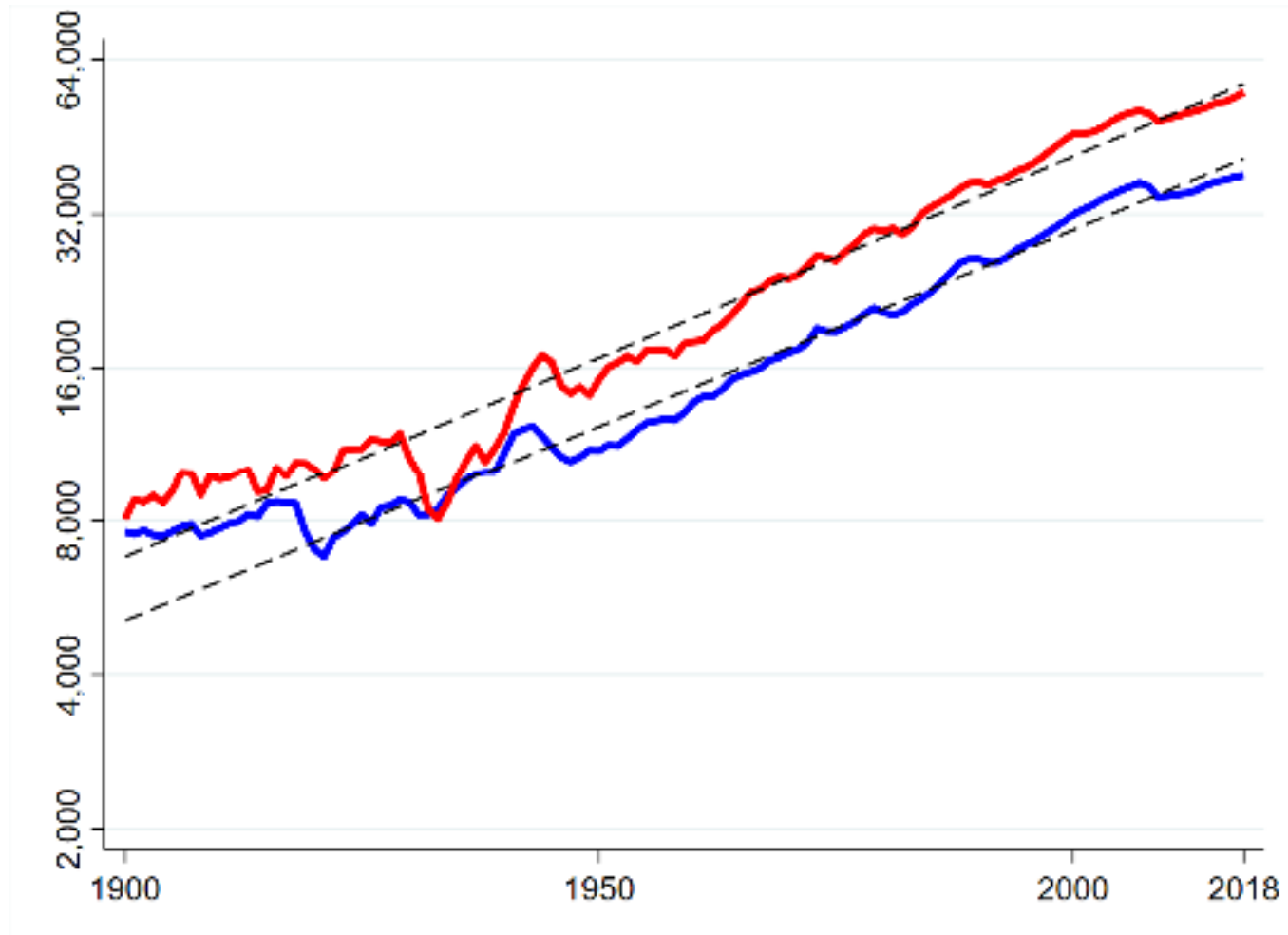
## Real GDP per capita: since 1900



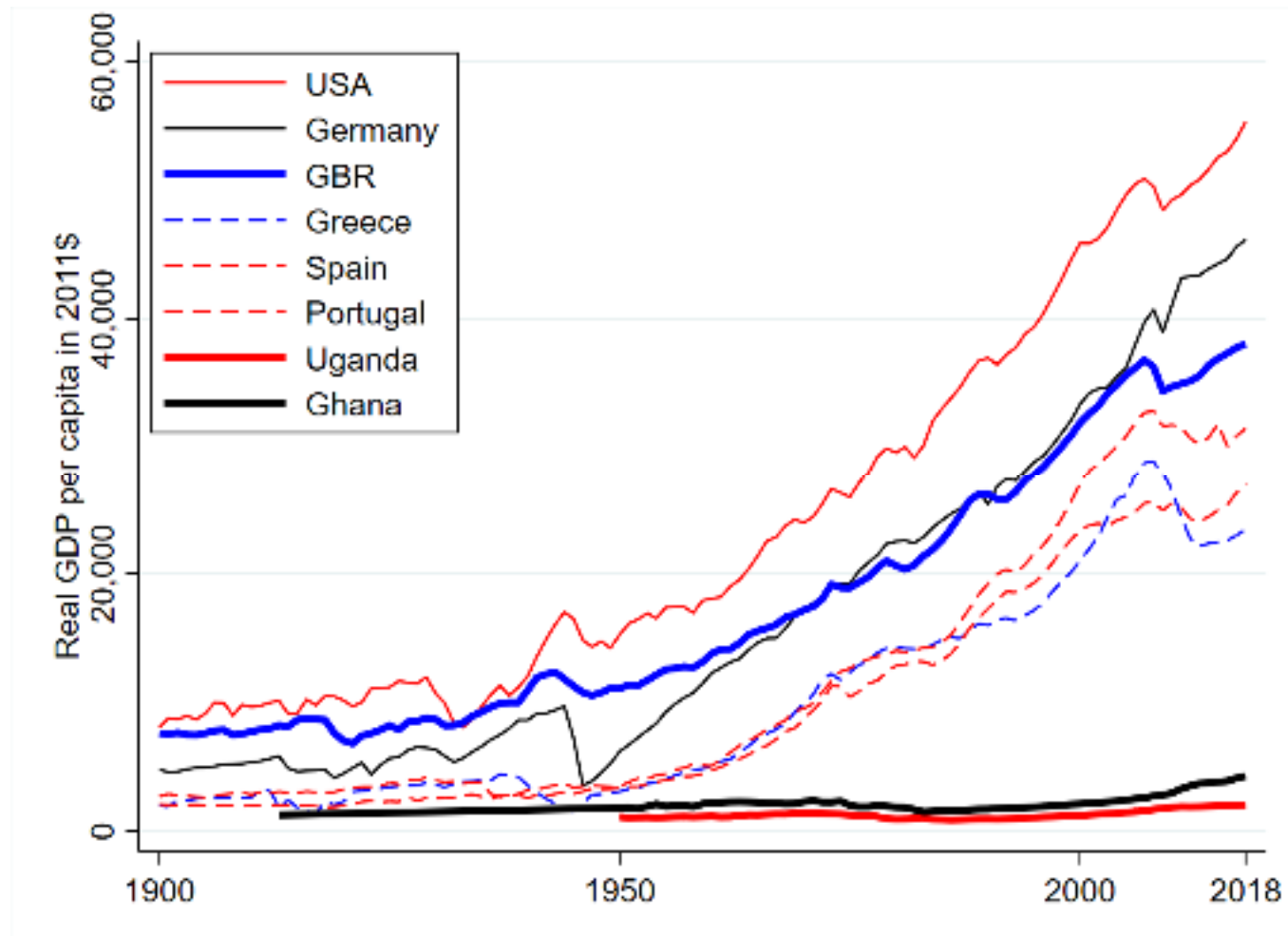
## Real GDP per capita (in log scale)



## Real GDP per capita (in log scale): US and UK since 1990



## Real GDP per capita: across countries



## Economic growth (and development)

1. Among G7 countries, there seem to be some enhancement in growth in 1800s and acceleration thereafter: why?
2. There appears to be convergence among G7 countries in that countries behind the frontier (like France, Germany and Japan in 1945) would catch up eventually: why?
3. Including more countries in the sample (e.g. Ghana and Uganda), the convergence pattern does not seem to hold: why?
4. What is responsible for the lack of growth in some area like sub-Saharan Africa?



Queen Mary

University of London