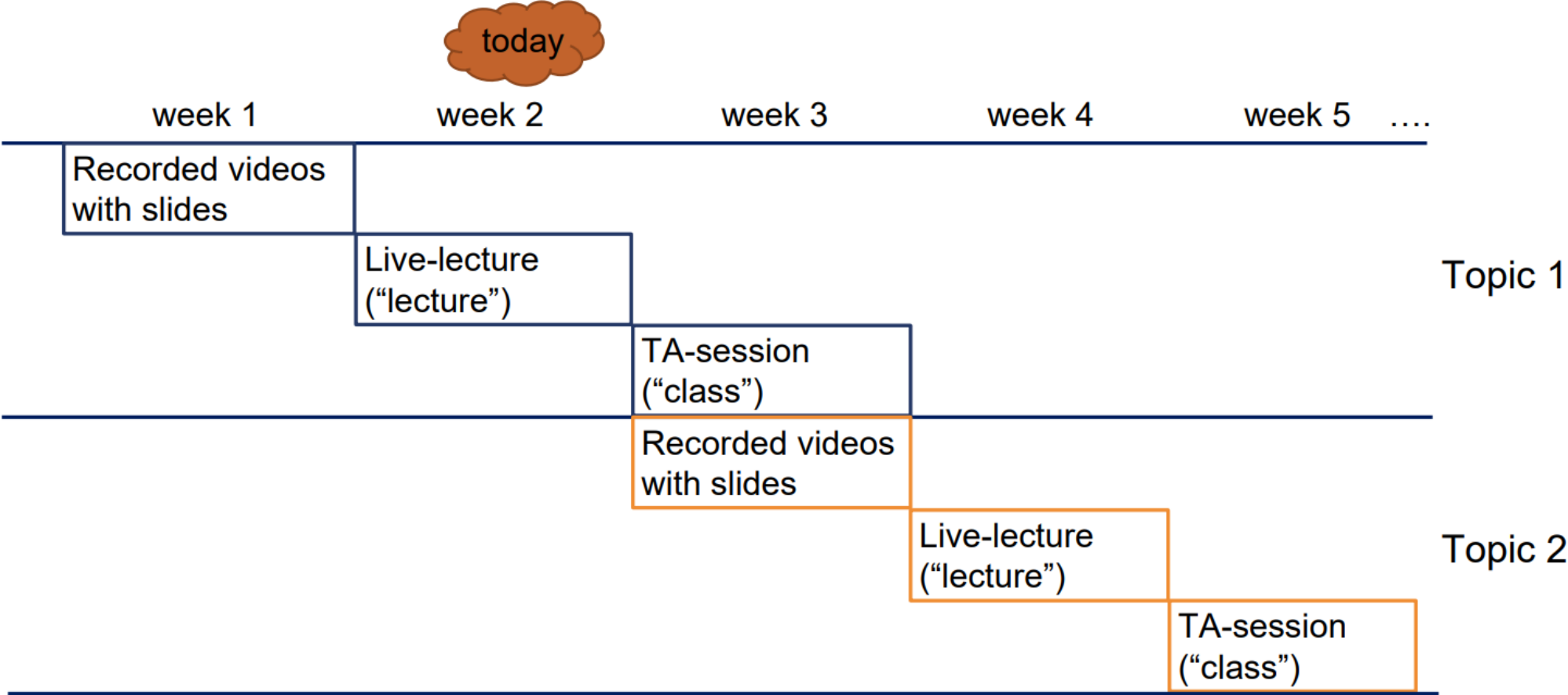


# ECOM181 Macroeconomics for Policy

## 2022/23 Semester 1

Joep Lustenhouwer

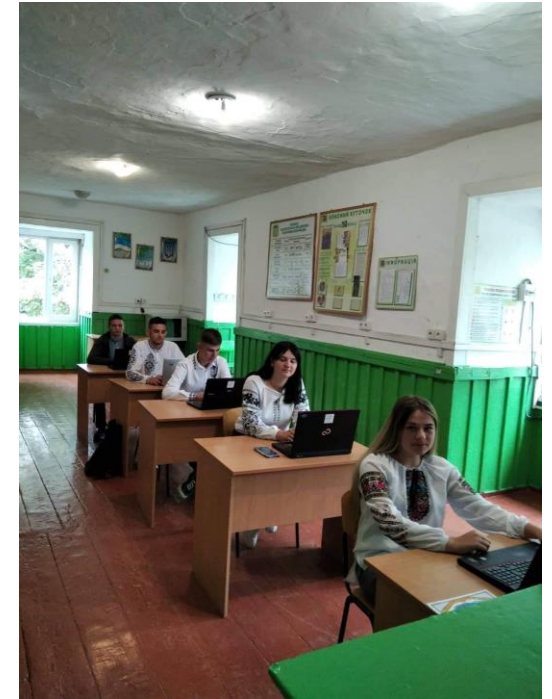
# Structure



# Plan for today

- Introductions
- Discussion based on Science vs Engineering
- Introduction to HP filter → for TA Session (class)
- Discussion based on recorded videos

# When I am not doing research...



# The Macroeconomist as Scientist and Engineer.

Mankiw, N, Gregory. 2006

Journal of Economic Perspectives, 20 (4): 29-46.

# Questions to discuss

- What is the major role of economists in government ministries?
- Do you think you will need a PhD to become a chief economist?

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# Business cycles and filtering

We define trends and fluctuation more formally.

Output is equal to the trend and cyclical components:

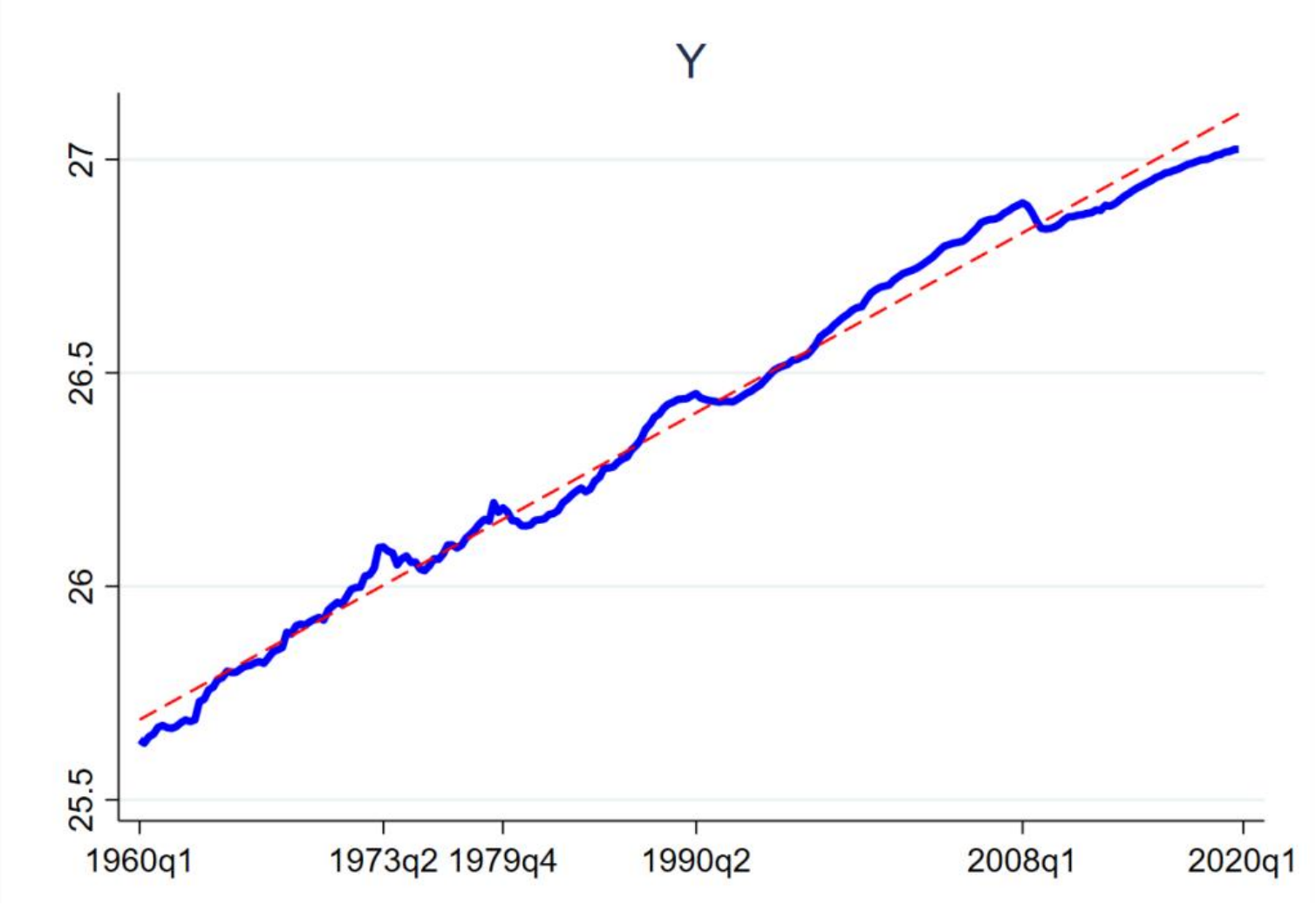
$$\underbrace{Y_t}_{\text{Output}} = \underbrace{\bar{Y}_t}_{\text{trend}} + \underbrace{\tilde{Y}_t}_{\text{cyclical components}}$$

How to derive  $\bar{Y}_t$ ...?

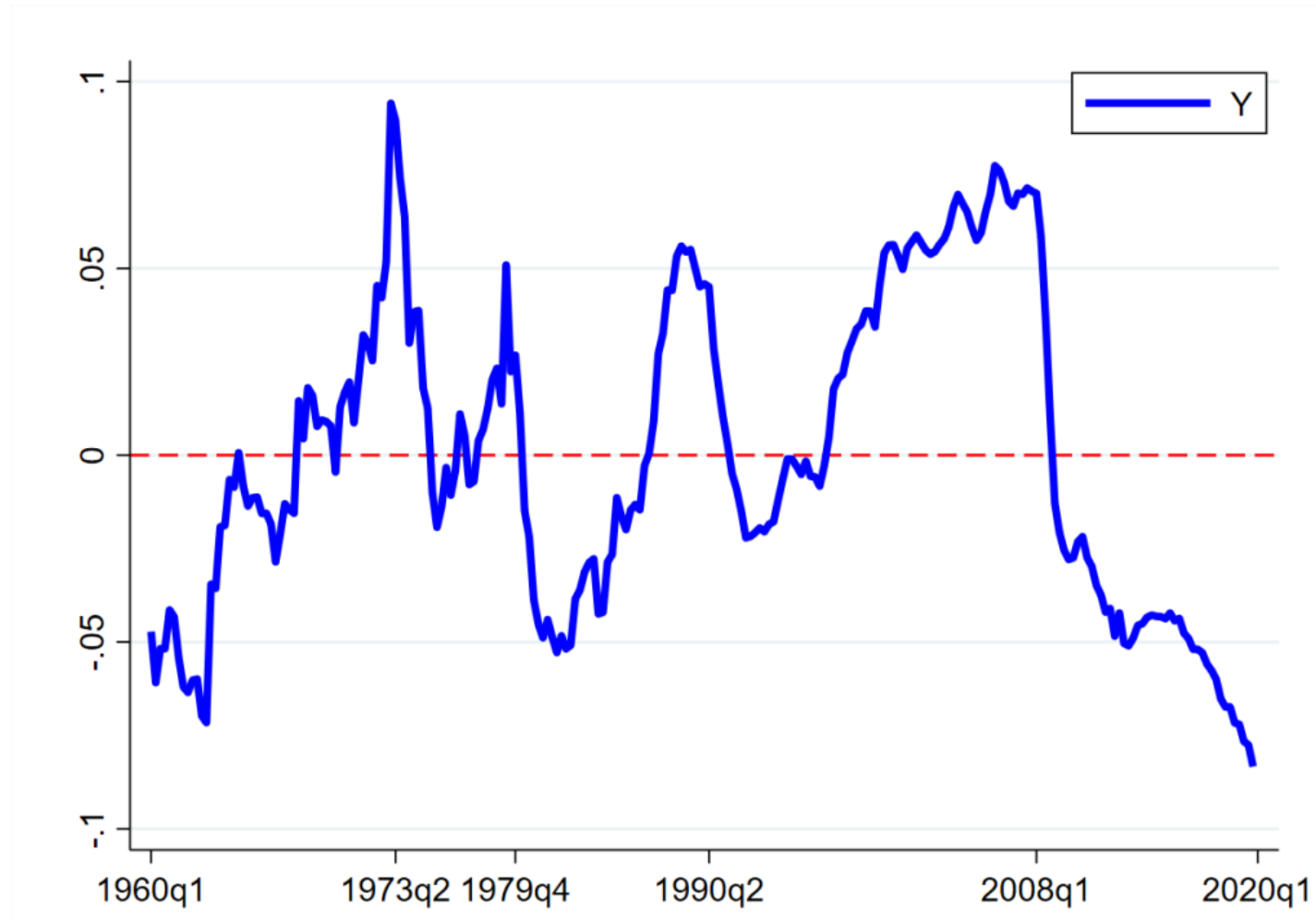
- We saw a linear trend, which creates long cycles (too long)
- We study the HP filter (Hodrick and Prescott filter) that fits the trend in a flexible way.



# UK business cycles (linear trend)?



# UK business cycles (linear trend)?

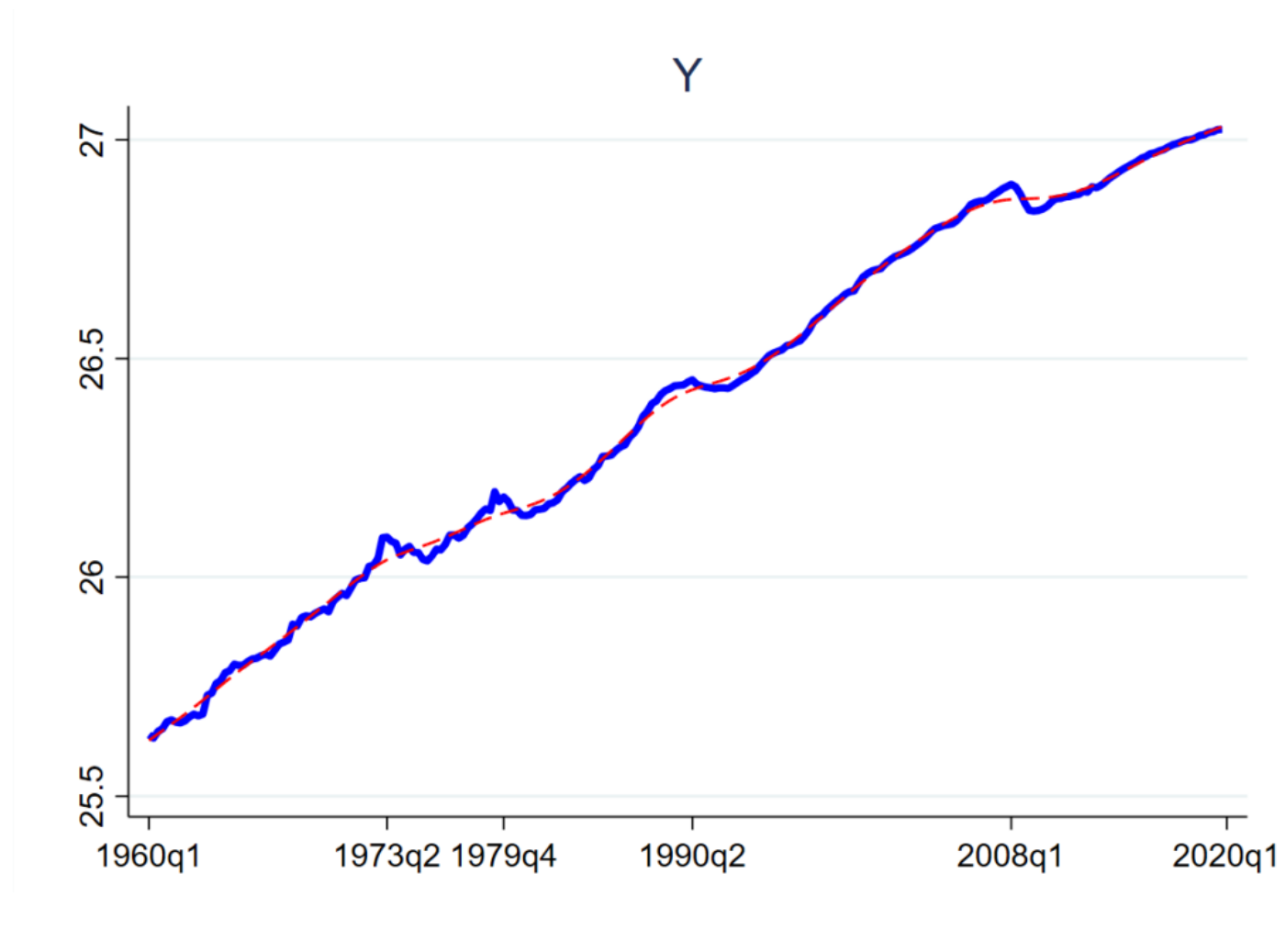


# Hodrick-Prescott filter

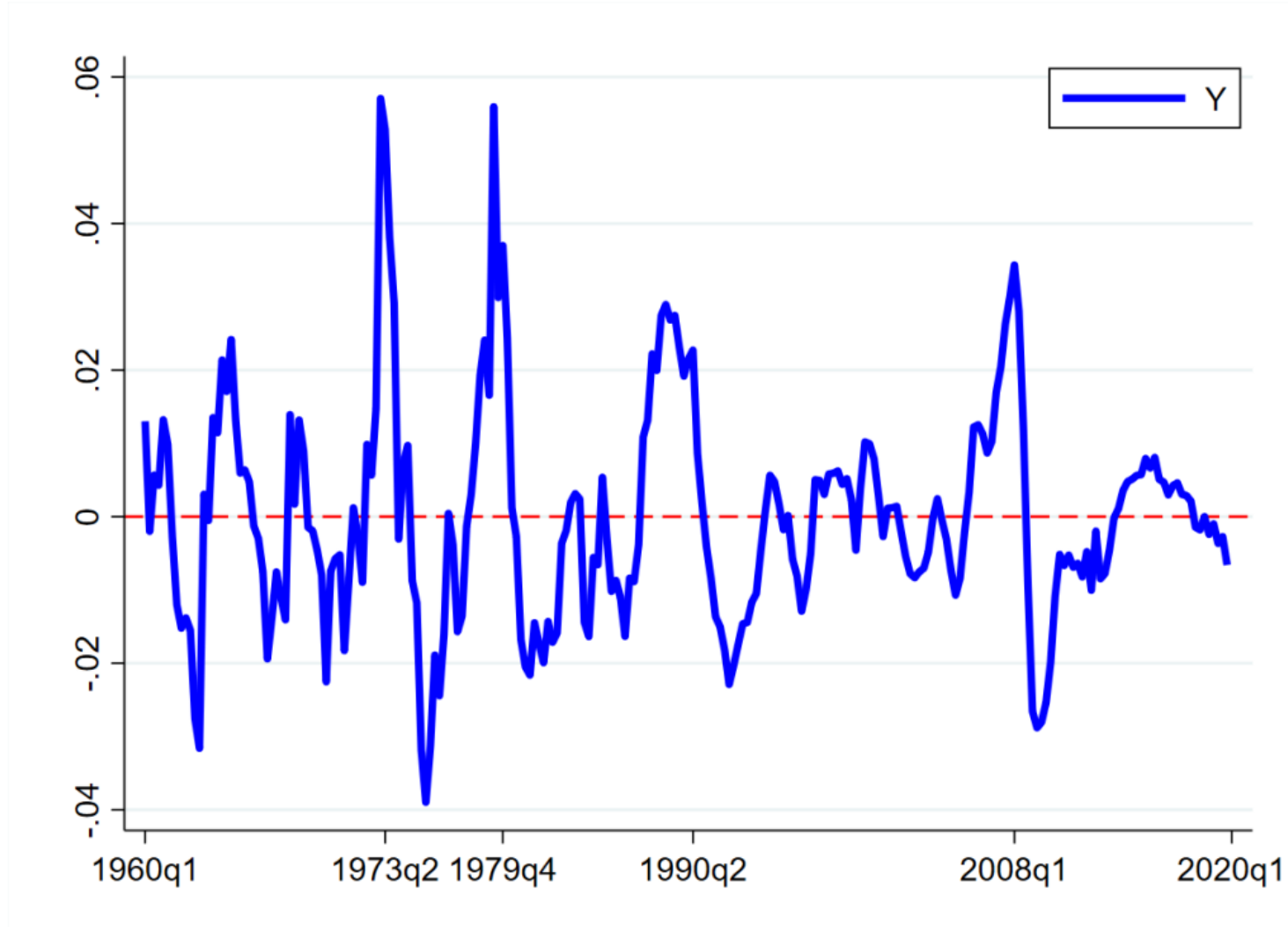
$$\min_{\{\bar{Y}_t\}_{t=0}^T} \left\{ \sum_{t=0}^T (Y_t - \bar{Y}_t)^2 + \lambda \sum_{t=1}^{T-1} ((\bar{Y}_{t+1} - \bar{Y}_t) - (\bar{Y}_t - \bar{Y}_{t-1}))^2 \right\}$$

1. The first term penalizes the cyclical component (tracking the series closely).
2. The second term penalizes variation of the growth rate of the trend (smoothing out the trend).

# UK business cycles: Hodrick-Prescott filter



# UK business cycles: Hodrick-Prescott filter



# TA session next week (class)

We will try HP filtering in the TA session

Not necessary though, you may want to set up your R (or STATA) environment before the session.

You will find two codes: one for R and one for STATA.

We will demonstrate and you will “see” how it goes.

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# Possible points of discussion from videos

- Why kink in investment around 1990?
- Black Wednesday; why did UK join European Exchange Rate Mechanism in the first place?
- COVID pandemic followed by russian aggression and high energy prices.
  - What awaits us now?
  - What has happened to government consumption as fraction of GDP?



# What part of GDP is Government consumption?

