ACCOUNTING FOR BUSINESS CYCLES

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Course material available at https://pascalmichaillat.org/c5/

OUTLINE

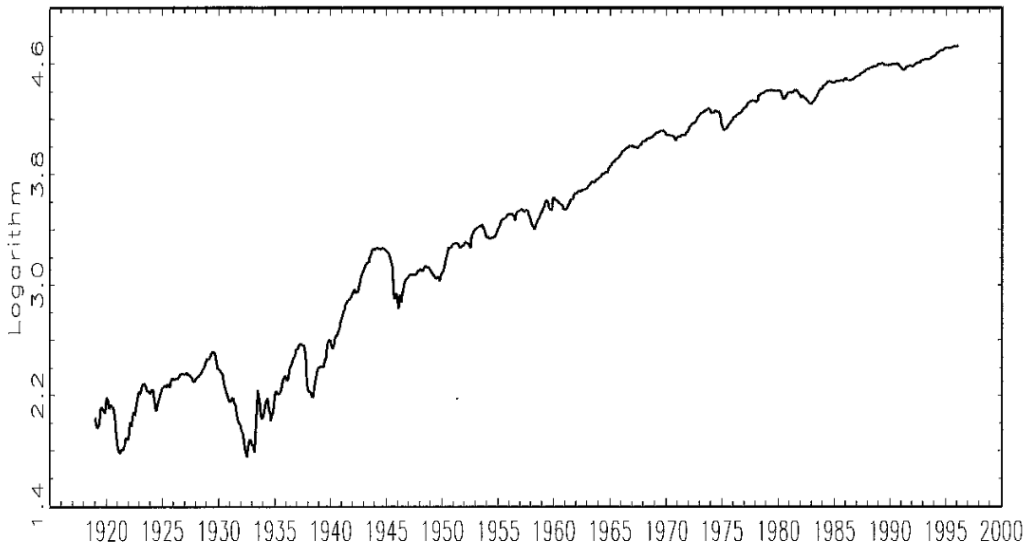
- Define business cycles
- Define capacity and its utilization
- Show that capacity is acyclical...
- ... While its utilization is procyclical
- Discuss the cost of business cycles and need for stabilization

DEFINITION OF BUSINESS CYCLES

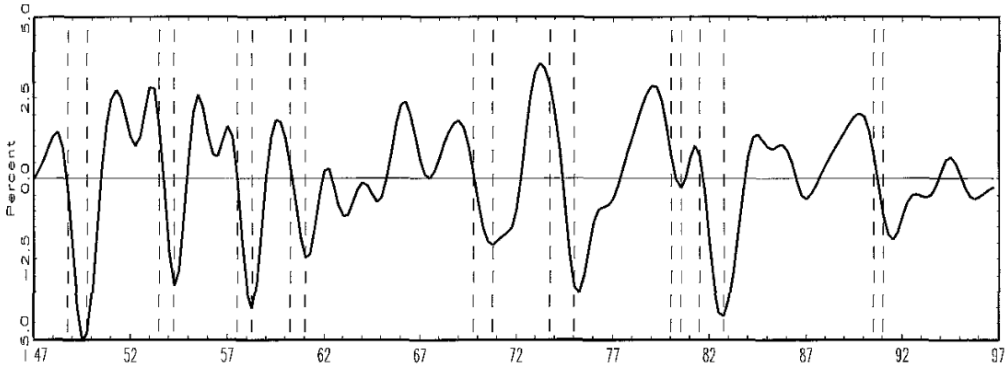
DEFINITION OF BUSINESS CYCLES (BURNS, MITCHELL 1946)

A cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; this sequence of changes is recurrent but not periodic; in duration business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar character with amplitudes approximating their own.

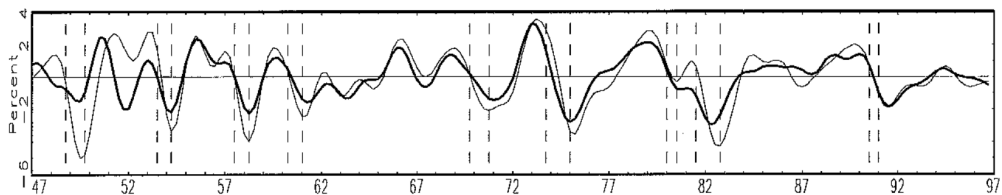
INDUSTRIAL PRODUCTION FLUCTUATIONS (STOCK, WATSON 1999)



REAL GDP FLUCTUATIONS (STOCK, WATSON 1999)



CONSUMPTION FLUCTUATIONS (STOCK, WATSON 1999)



BUSINESS-CYCLE ACCOUNTING

SIMPLE ACCOUNTING FRAMEWORK

- Production identity:

$$\text{production} = \text{productive capacity} \times \text{utilization}$$

- Expression in terms of slack = 1 – utilization

$$\text{production} = \text{productive capacity} \times [1 - \text{slack}]$$

- Possible source of business-cycle fluctuations:
  - Fluctuations in productive capacity
  - Fluctuations in slack
  - Or both

SOURCE OF BUSINESS-CYCLE FLUCTUATIONS IN THE LITERATURE

- General Disequilibrium model (1970s): fluctuations in slack
  - Markets are not clearing so slack > 0
  - Fluctuations in slack due to aggregate demand shocks
- Real Business-Cycle model (1980s–1990s): fluctuations in capacity
  - Markets are competitive so utilization = 100%
  - Fluctuations in capacity due to technology shocks
- New Keynesian model (2000s–2010s): fluctuations in capacity
  - Markets are monopolistically competitive so utilization = 100%
  - Fluctuations in capacity due to aggregate demand shocks and response of participation

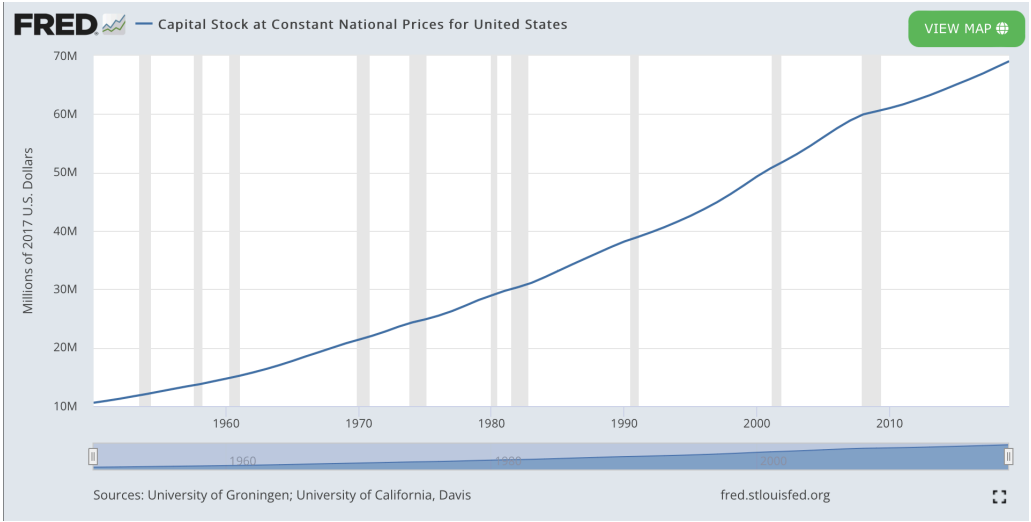
CAPACITY IS ACYCLICAL

INPUTS INTO PRODUCTIVE CAPACITY

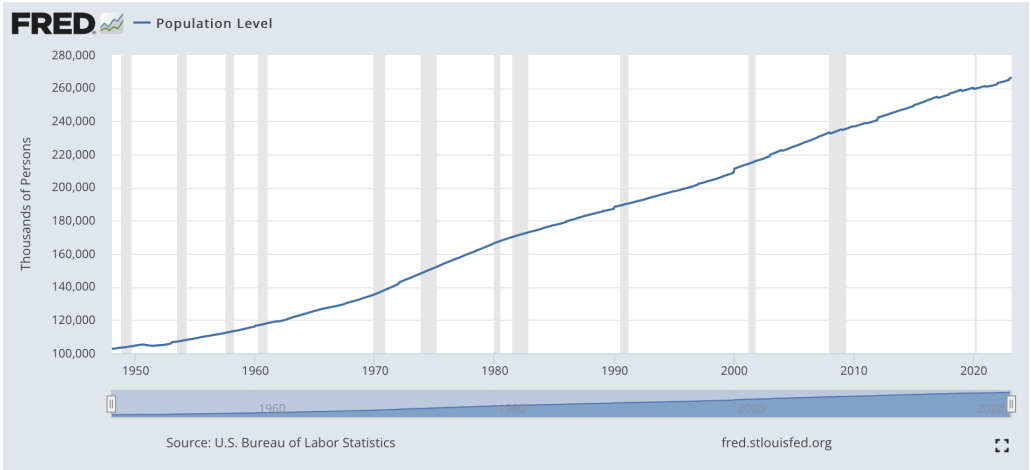
- Capital stock
- Labor force: share of the working-age civilian population that wishes to work and is available
- Technology
- All inputs are combined through production process (production function)

$\Rightarrow$ Productive capacity

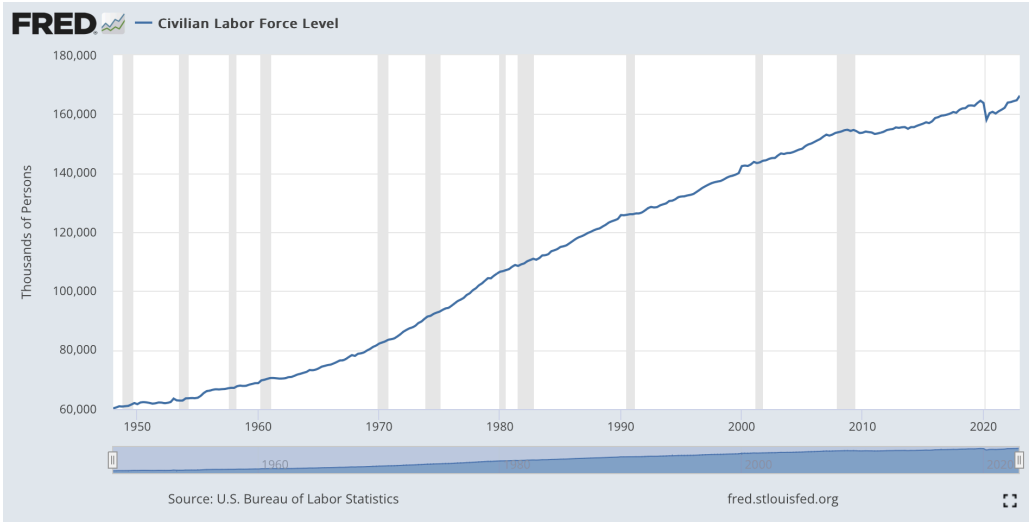
CAPITAL STOCK IN CONSTANT DOLLARS



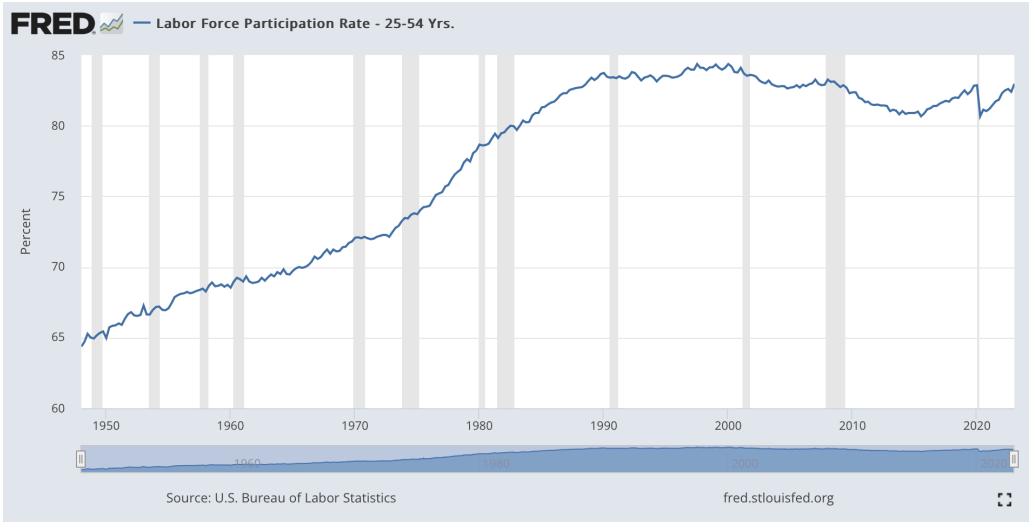
CIVILIAN POPULATION



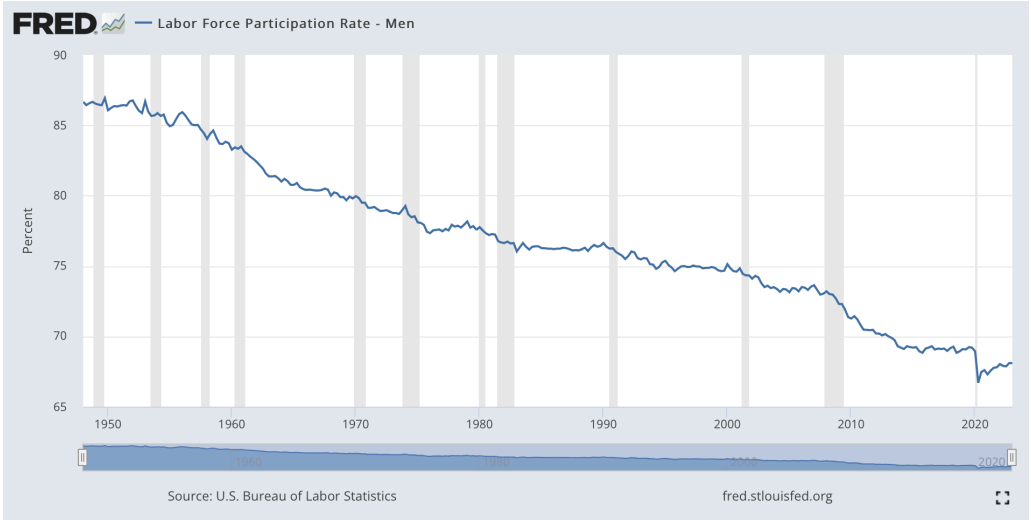
CIVILIAN LABOR FORCE



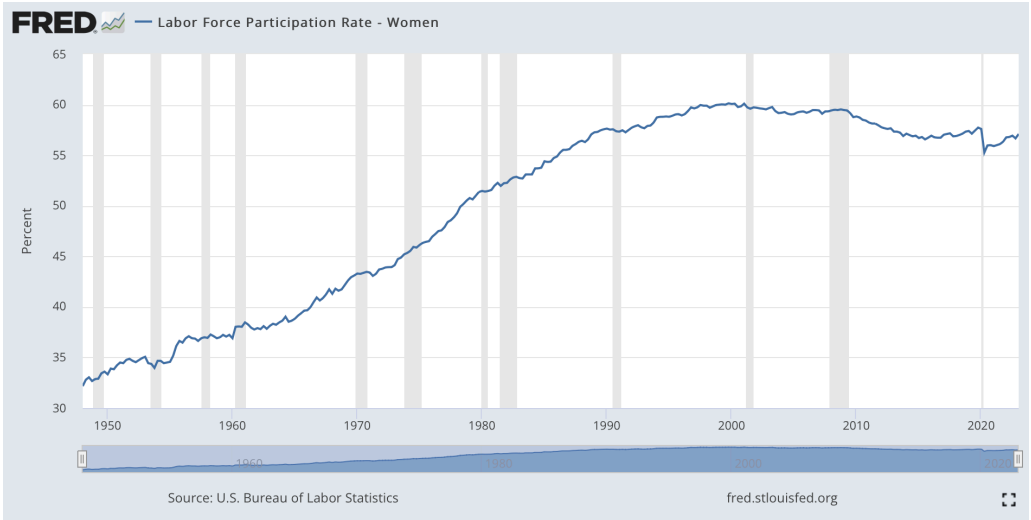
LABOR-FORCE PARTICIPATION RATE (PRIME AGE)



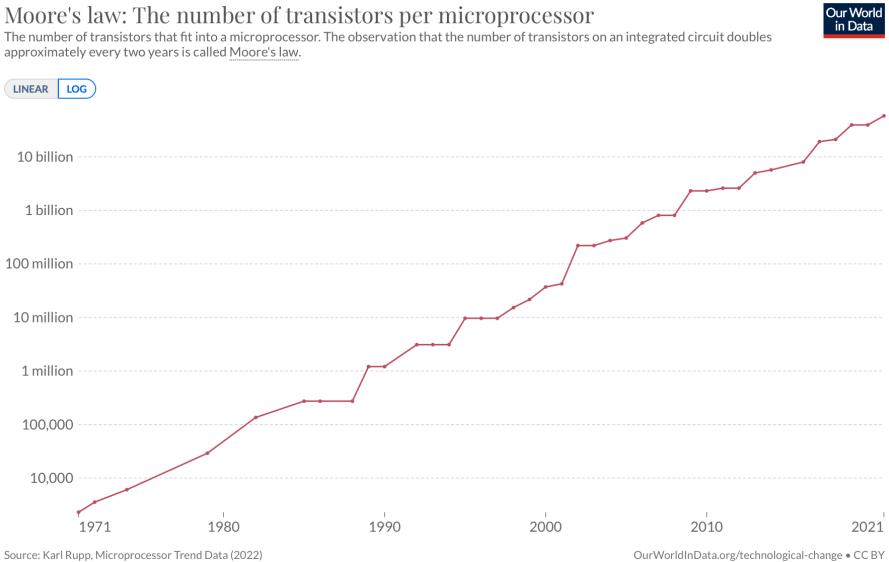
LABOR-FORCE PARTICIPATION RATE (MEN)



LABOR-FORCE PARTICIPATION RATE (WOMEN)



PROXIES FOR TECHNOLOGY



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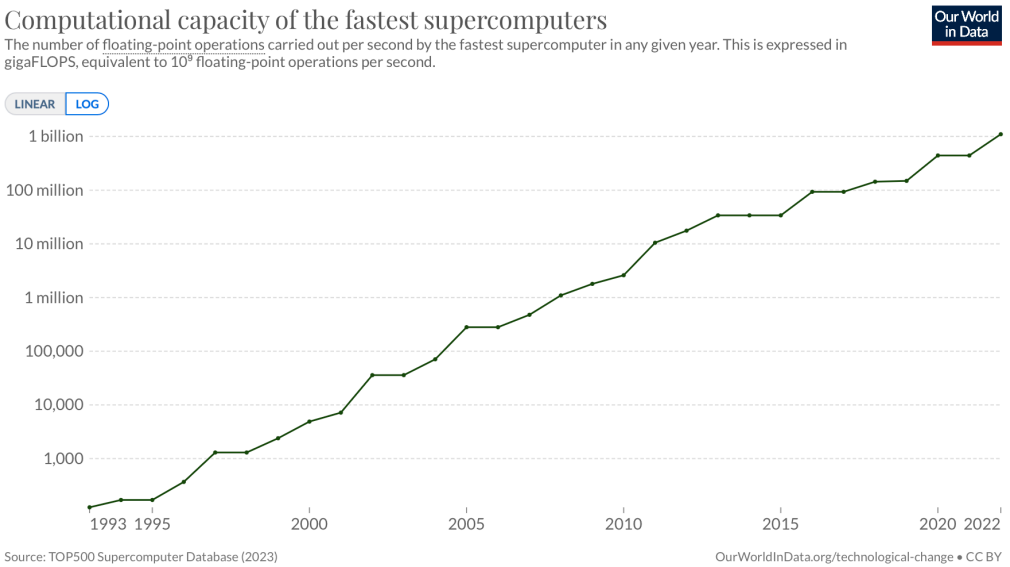


TECHNOLOGY: DIFFICULT TO MEASURE BUT LIKELY ACYCLICAL

- In practice, technology is bound to be unrelated to business cycles
  - Invention process is slow and random
  - Diffusion process is slow and random
  - Depreciation process (loss of know-how) is slow and random
- Total factor productivity (TFP) is procyclical
  - But TFP is a residual, driven almost exclusively by factor utilization

CAPACITY UTILIZATION ⇒ TFP (STOCK, WATSON 1999)

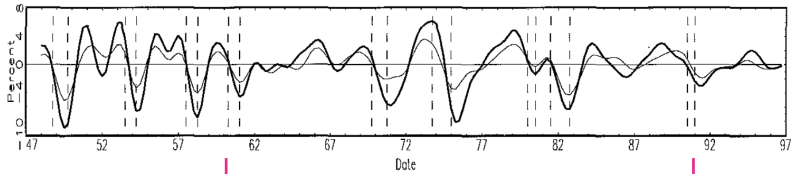


Fig. 3.31. Factor utilization in manufacturing.

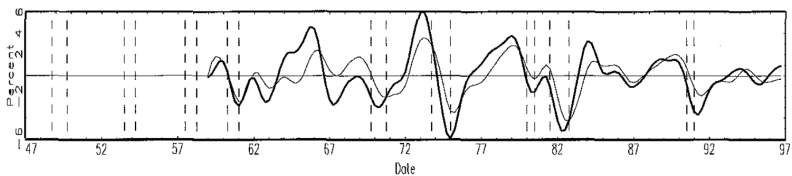


Fig. 3.32. Total factor productivity.

SLACK IS COUNTERCYCLICAL

OCCURRENCES OF SLACK

- Slack on the labor market:

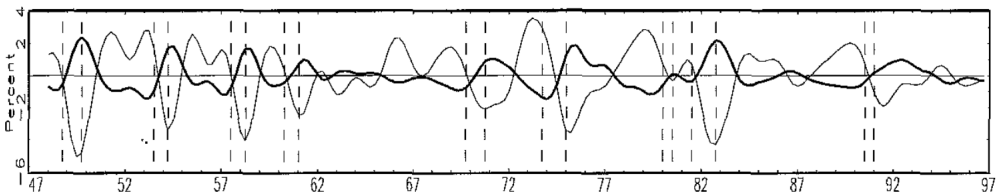
$$\text{employment} = (1 - \text{unemployment}) \times \text{labor force}$$

- Slack on the product market with production function f:

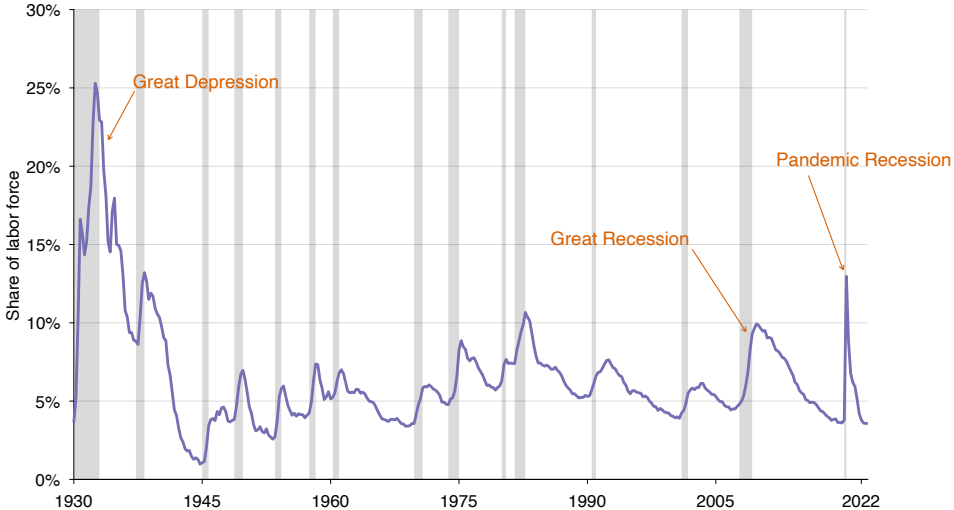
$$\text{production} = (1 - \text{idleness}) \times f(\text{technology}, \text{capital}, \text{employment})$$

- Two forms of slack
  - Unemployment: share of labor force that is not employed
  - Idleness: share of firms' capacity (based on current capital stock and number of employees) that is not in use

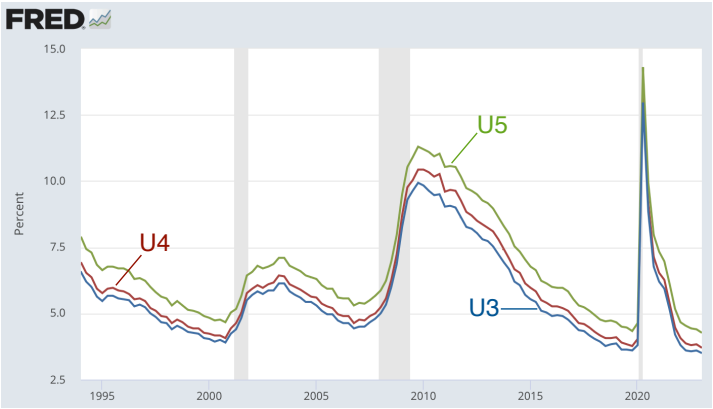
UNEMPLOYMENT RATE (STOCK, WATSON 1999)



UNEMPLOYMENT RATE (MICHAILLAT, SAEZ 2022)



OTHER UNEMPLOYMENT: 1% OF LABOR FORCE IN GREY AREA

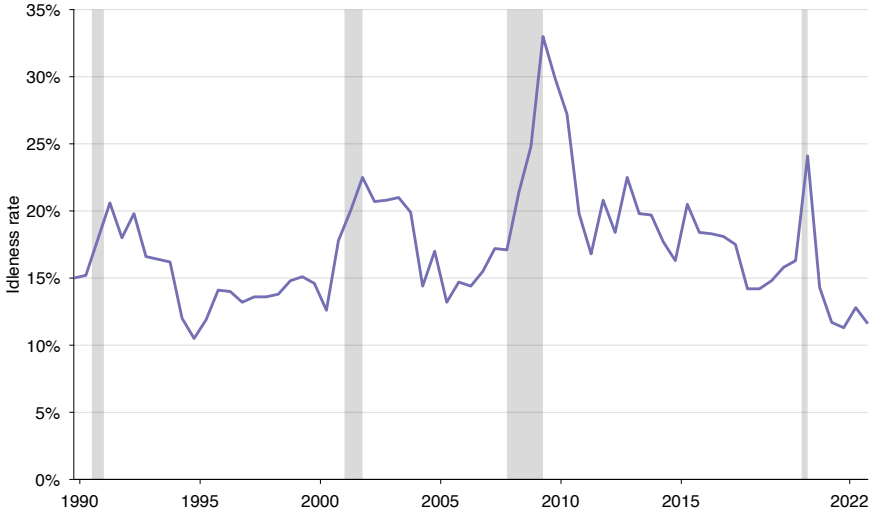


- U3 = people wanting to work, available to work, and having searched for a job in past 4 weeks
- U4 = U3 + people people discouraged by lack of jobs
- U5 = U4 + people having searched for job in past year

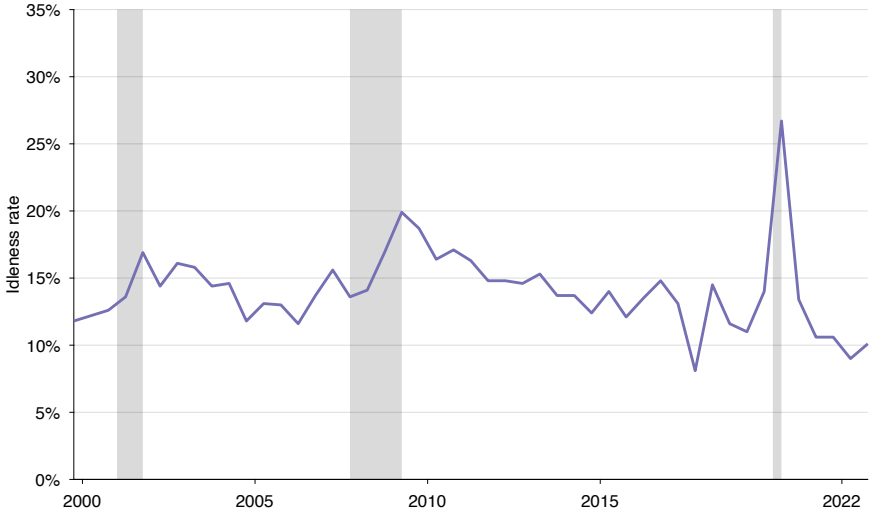
OPERATING RATE AND IDLENESS RATE

- Data from Institute for Supply Management (ISM)
- Semi-annual Economic Forecast: Fall 2022 example
- Operating rate = actual production level of firms as a share of their maximum production level given current capital and labor (normal capacity)
- (Note that the ISM reports a lot of other interesting statistics on slack and tightness)

IDLENESS RATE IN MANUFACTURING (ISM SURVEY)

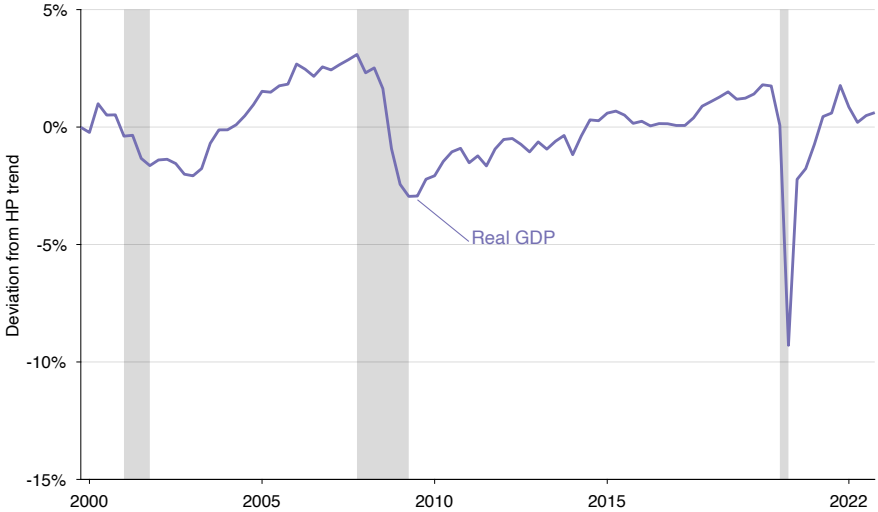


IDLENESS RATE IN SERVICES (ISM SURVEY)



FLUCTUATIONS IN SLACK ACCOUNT FOR BUSINESS CYCLES

FLUCTUATIONS IN GPD AND CONSUMPTION



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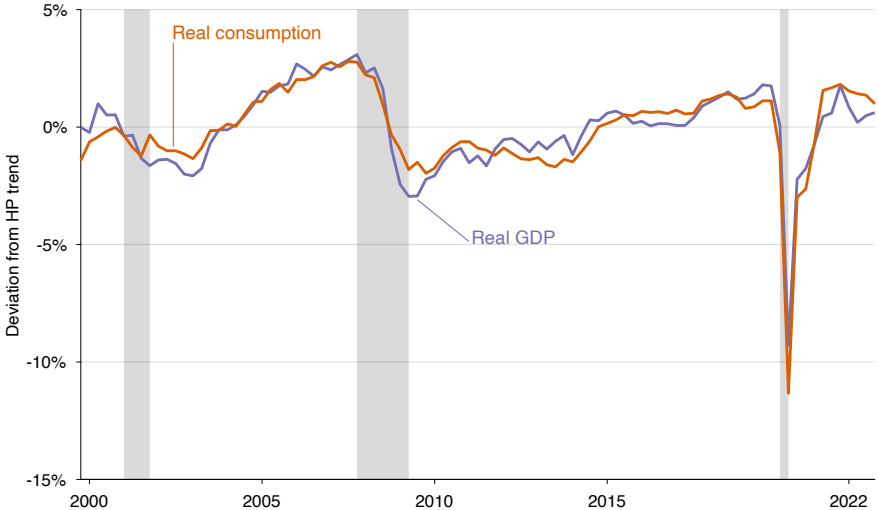
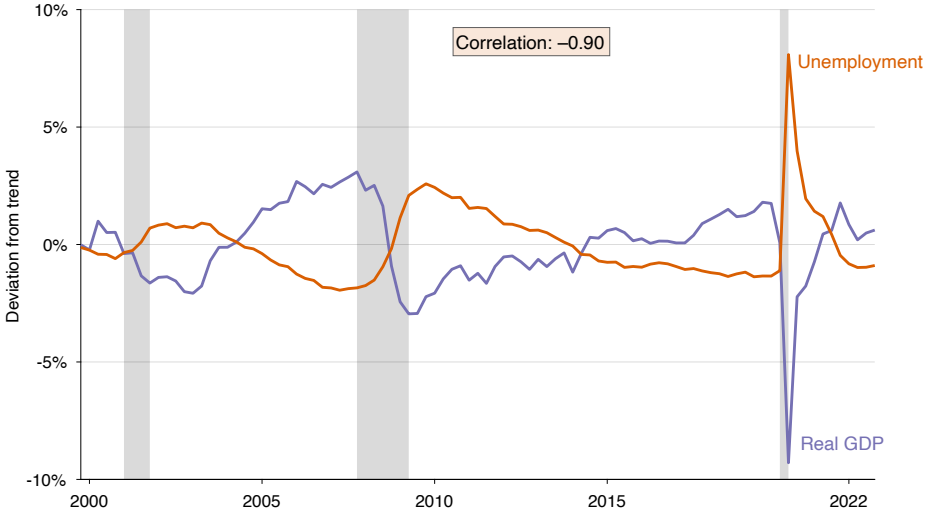


FLUCTUATIONS IN SLACK AND GDP



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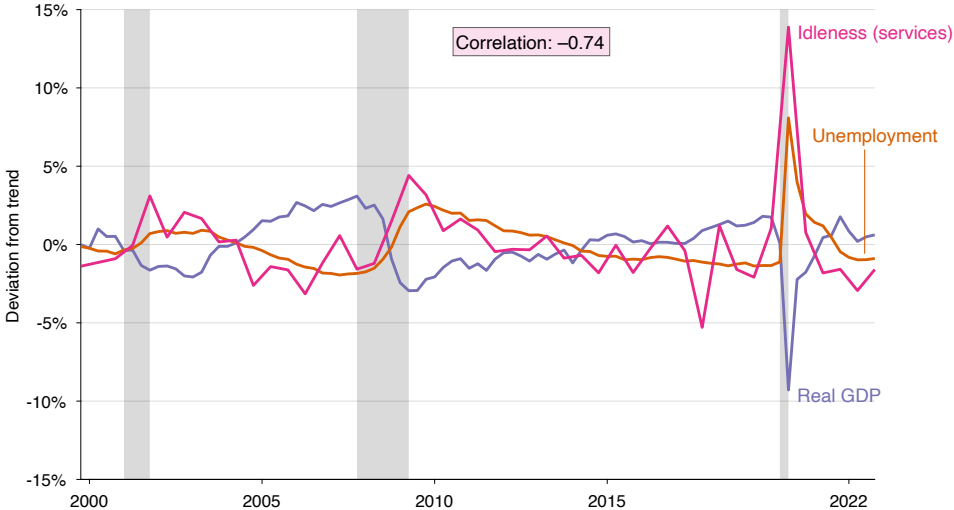

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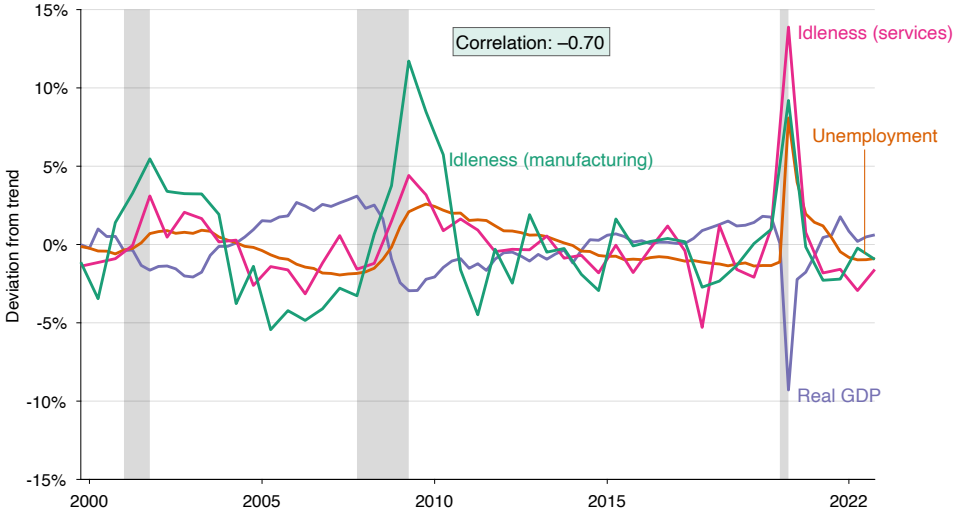
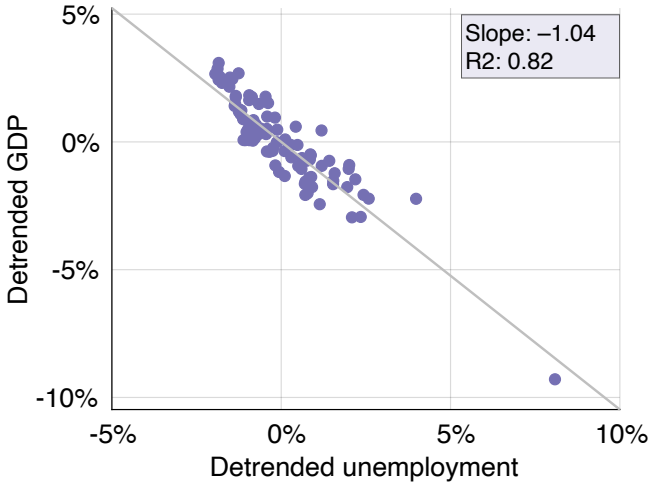


RECASTING THE RESULTS AS OKUN'S LAWS



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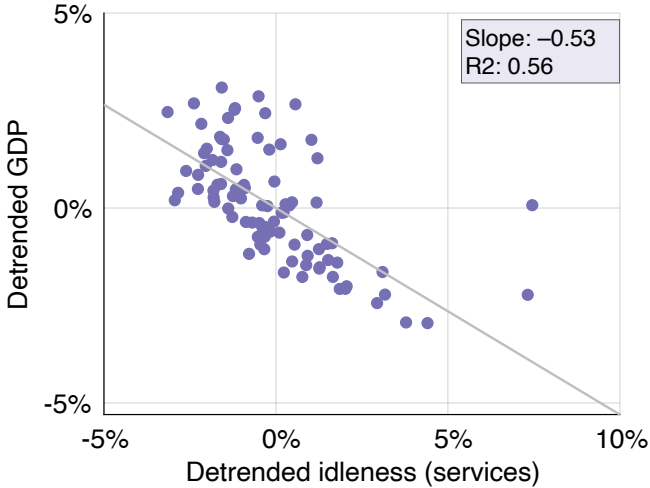

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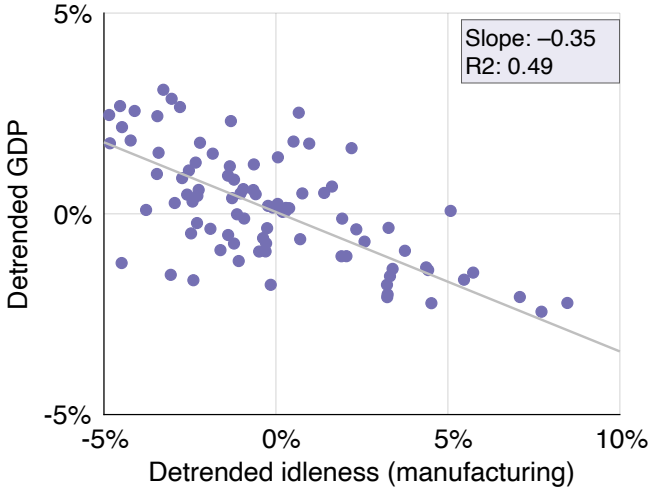
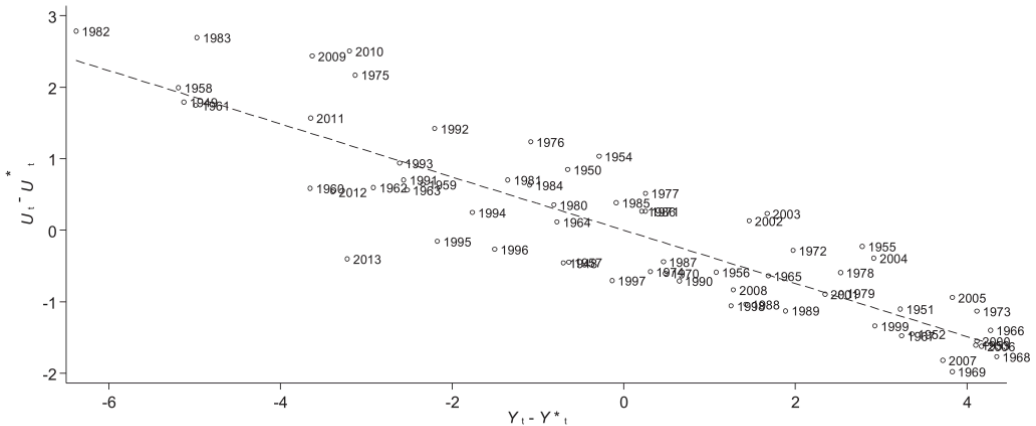


OKUN'S LAW IN THE UNITED STATES, 1948–2013 [BALL, LEIGH, LOUNGANI 2017]



COST OF SLACK AND NEED FOR STABILIZATION

COST OF BUSINESS CYCLES AND NEED FOR STABILIZATION

- Slumps lead to elevated slack ⇝ productive capacity is not used ⇝ wasted consumption and welfare
- However, some slack is required to maximize welfare ⇝ because excessive tightness also has costs
  - Time and effort spent recruiting and hiring
  - Time and effort spent shopping and buying
- Furthermore, slack in the form of unemployment imposes large, additional social costs
- Slack should be stabilized to a low, adequate level

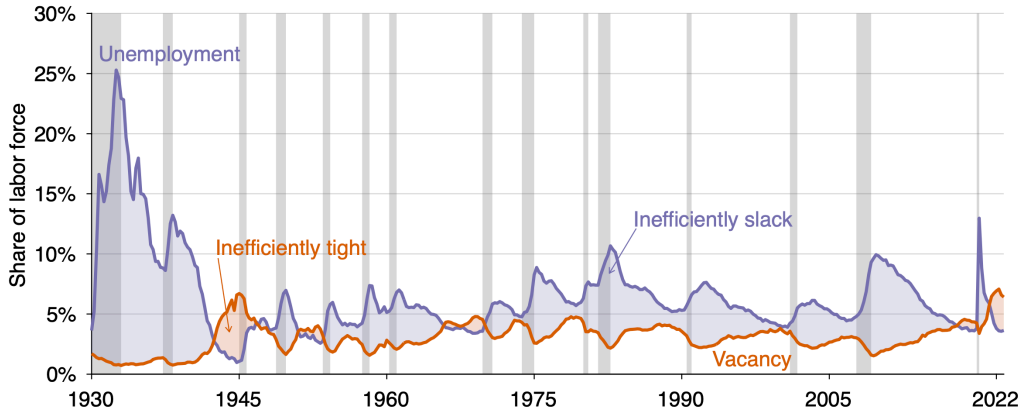
NON-MONETARY COST FROM UNEMPLOYMENT

- Controlling for income and other personal characteristics, unemployment imposes large costs
- Di Tella, MacCulloch, Oswald (2003): “Recessions create psychic losses that extend beyond the fall in GDP and rise in the number of people unemployed. These losses are large.”
  - US General Social Survey: becoming unemployed is as painful as divorcing or dropping from the top to the bottom income quartile
  - Euro-barometer survey: becoming unemployed is as bad as losing $3,500 of income a year, about 45% of average per-capita income
- Blanchflower, Oswald (2004): becoming unemployed is as bad as losing $60,000 of income a year, 3 times average yearly per-capita income

WHERE DO THE PSYCHOLOGICAL COSTS OF UNEMPLOYMENT COME FROM?

- Depression, anxiety, and strained personal relations [Eisenberg, Lazarfeld 1938]
- Job loss is a traumatic event that reduces self-esteem [Akerlof, Yellen 1985]
- Joblessness reduces psychological well-being by creating a feeling that life is not under one's control [Goldsmith, Darity 1992]
- The benefits of work that are lost in unemployment include [Jahoda 1981]:
  - Time structure on the working day
  - Regularly shared experiences and contacts with people outside the nuclear family
  - Goals and purposes that transcend their own
  - Source of personal status and identity
  - Regular activity

SOCIAL VALUE OF NONWORK FROM REVEALED PREFERENCES

- Borgschulte, Martorell (2018): natural experiment using military administrative data
  - 420,000 veterans
  - must choose between reenlisting with various bonuses and moving back home to enter local labor market with various unemployment rates $\rightsquigarrow$ can compare how higher unemployment rate affects decisions
  - nonwork time has low value: home production + recreation = 13%–35% earnings
- Mas, Pallais (2019): field experiment in which job applicants choose wage-hour bundles
  - 900 subjects
  - home production + recreation = 58% earnings
  - subjects are already partially employed $\rightsquigarrow$ upper bound on value of nonwork

CURRENT US STABILIZATION IS INCOMPLETE [MICHAILLAT, SAEZ 2022]