

MACROECONOMICS 042EC

03 – Analysis in the medium run

The labour market (Ch 7)

Ludovico Carrino

Remember this?

$$Y = Z = c_0 + c_1(Y - T) + \bar{I} + G$$

- 2nd round starts: the increase in income further increases consumption (through c_1)
- → increases demand → increases production = increases income → increases consumption (through c_1), and so on with 3rd, 4th round etc.
- Because the marginal propensity to consume (c_1) is less than 1, each increase in income and each corresponding increase in consumer spending is smaller than in the previous round.
 - Recall that at each round some of the increase in income goes into savings.
- As a result, although production (GDP) grows at each round, the increase diminishes from each round to the next.
- At some point the increase in production is negligible, and the economy converges to a new income-expenditure equilibrium (point A').

Remember this? Something's missing

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- We assumed:
 - firms (=supply) were able and willing to comply to any change in demand
 - without changes in price level
 - without changes in employment or unemployment
- If the former conditions apply, then we are in 'the short run'
 - In the short run we are talking about changes in demand that are not substantial, or just transitory
- The medium run is a time horizon when the former do not apply. Rather:
 - Prices change, and we need to understand why
 - The labour market changes, we need to understand why and how it relates to prices

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Remember this? Something's missing

The Washington Post

Business Economy Economic Policy Media Personal

U.S. employers added 130,000 jobs in January, the strongest gain in months

The unemployment rate ticked down to 4.3 percent, a slight improvement, while large revisions slashed job gains from 2024 and 2025.

Updated February 11, 2026

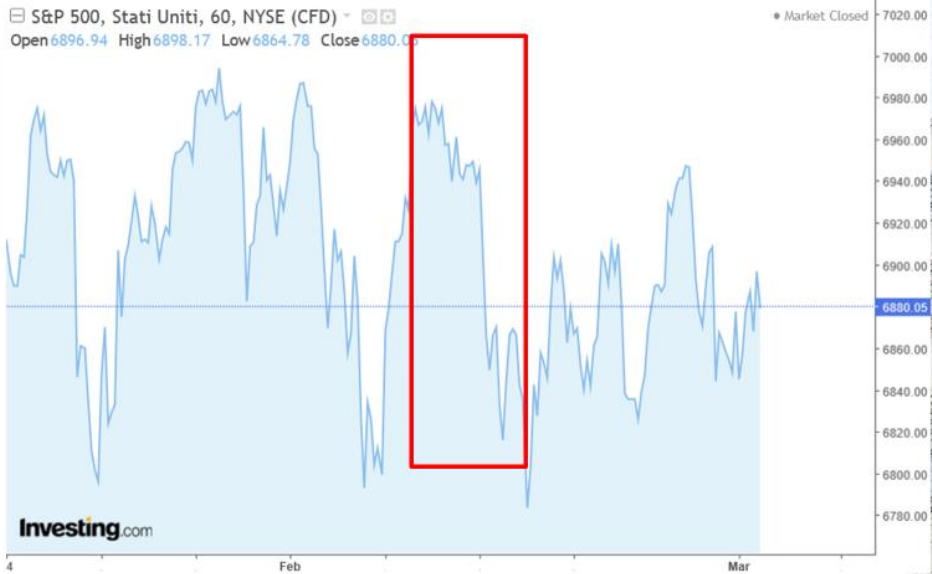
February 2026 Labor Market Review: Job Gains Exceed Expectations

February 12, 2026 | Sydney Ross

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Good news for employment, bad for stocks?

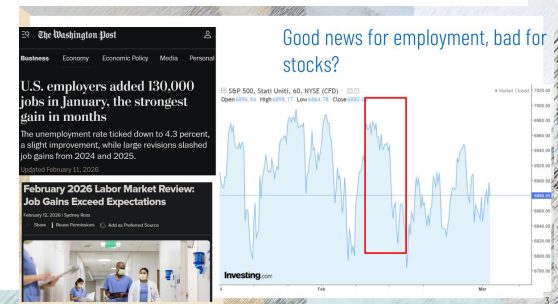


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- When firms respond to an increase in demand by increasing production, what happens to employment?
- Higher employment leads to lower unemployment.
- Lower unemployment leads to higher wages.
- Higher wages increase production costs, leading firms to increase prices.
- Higher prices lead workers to ask for higher wages.
- Higher wages lead to further increases in prices
- and so on.
- We have ignored this sequence of events.





INTERNATIONAL MONETARY FUND

IMF Country Report No. 26/36

GERMANY

**2025 ARTICLE IV CONSULTATION—PRESS RELEASE;
STAFF REPORT; AND STATEMENT BY THE EXECUTIVE
DIRECTOR FOR GERMANY**

February 2026

IMF recommendations for Germany

- It will be important to implement a high-quality easing.
 - Focus is needed to achieve an efficient ramp-up of infrastructure spending
- Over the medium and long run, rising aging-related, defense, and interest spending will require substantial consolidation of the non-defense, non-infrastructure budget
 - High-quality fiscal adjustment measures should be adopted over the medium and long term (once the output gap has mostly closed) to achieve this consolidation
- The planned fiscal easing is welcome.
 - Fiscal stimulus will help close the negative output gap and offset weakening external demand amid higher tariffs and euro appreciation.
 - Fiscal easing and higher public investment should also reduce Germany's current account imbalance

Germany: Selected Economic Indicators, 2024–27¹

	2024	<i>Projections</i>		
		2025	2026	2027
Output				
Real GDP growth (percent)	-0.5	0.2	1.1	1.5
Total domestic demand growth (percent)	0.2	1.7	1.5	1.6
Output gap (percent of potential GDP)	-1.1	-1.2	-0.7	0.1
Employment				
Unemployment rate (percent, ILO)	3.4	3.7	3.6	3.3
Employment growth (percent)	0.5	-0.1	0.1	0.2
Prices				
Inflation (percent, headline, period avg.)	2.5	2.3	2.3	2.0
Inflation (percent, core, period avg.)	3.2	2.8	2.3	2.2
General Government Finances				
Fiscal balance (percent of GDP)	-2.7	-2.4	-3.4	-4.1
Revenue (percent of GDP)	46.8	47.9	47.9	47.8
Expenditure (percent of GDP)	49.4	50.3	51.3	51.9
Cyclically adjusted balance (percent of GDP)	-2.1	-1.8	-3.0	-4.1
Public debt (percent of GDP)	62.2	62.6	63.9	65.7

Text Figure 7. Germany: Fiscal Policy Loosening

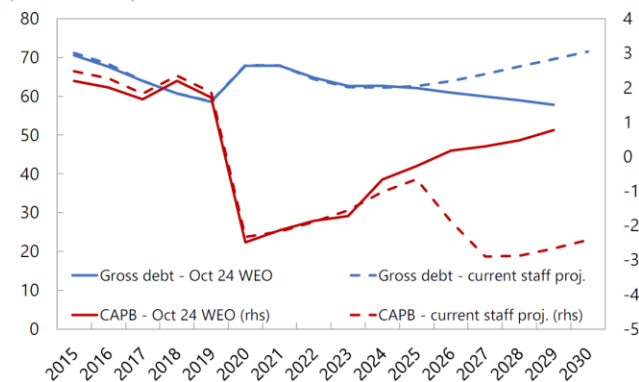
GERMANY

2025 ARTICLE IV CONSULTATION—PRESS RELEASE, STAFF REPORT, AND STATEMENT BY THE EXECUTIVE DIRECTOR FOR GERMANY

February 2026

Debt and Cyclically Adjusted Primary Balance

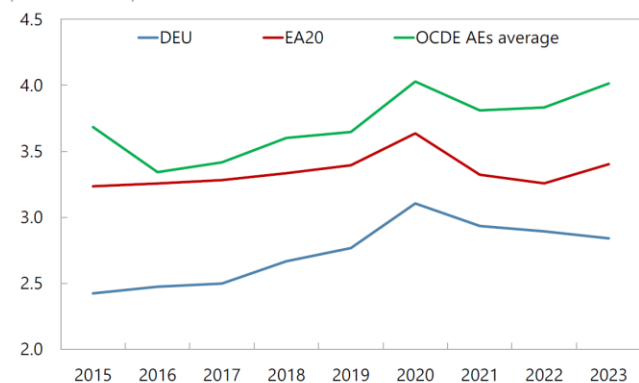
(Percent of GDP)



Sources: IMF *World Economic Outlook* and IMF staff calculations.

Gross Public Investment

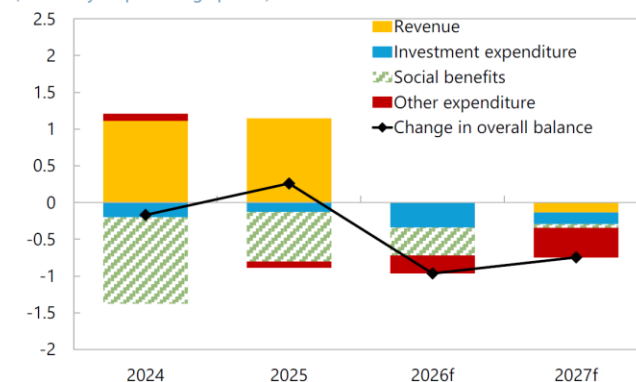
(Percent of GDP)



Sources: OECD and IMF staff calculations.

General Government Balance Change and Contributions

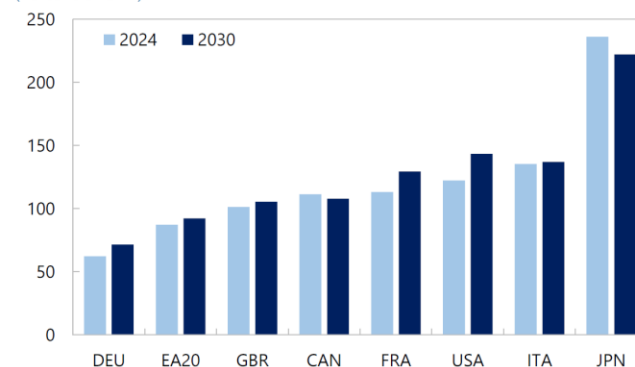
(Year-on-year percentage points)



Sources: Destatis and IMF staff calculations.

Gross Debt

(Percent of GDP)



Source: IMF October 2025 *World Economic Outlook* and IMF staff calculations. Note: Data for Germany reflects staff's current projections.

Australia central bank cuts inflation forecast, labour market still tight

By Reuters

February 18, 2025 6:41 AM GMT+1 · Updated a month ago



Aa



SYDNEY, Feb 18 (Reuters) - Australia's central bank expects underlying inflation to fall faster than previously expected as it downgraded the economic outlook, although a still tight labour market is likely to create some lingering price pressures.

Fed's Daly says rate cuts needed to keep labor market healthy

by Ann Saphir

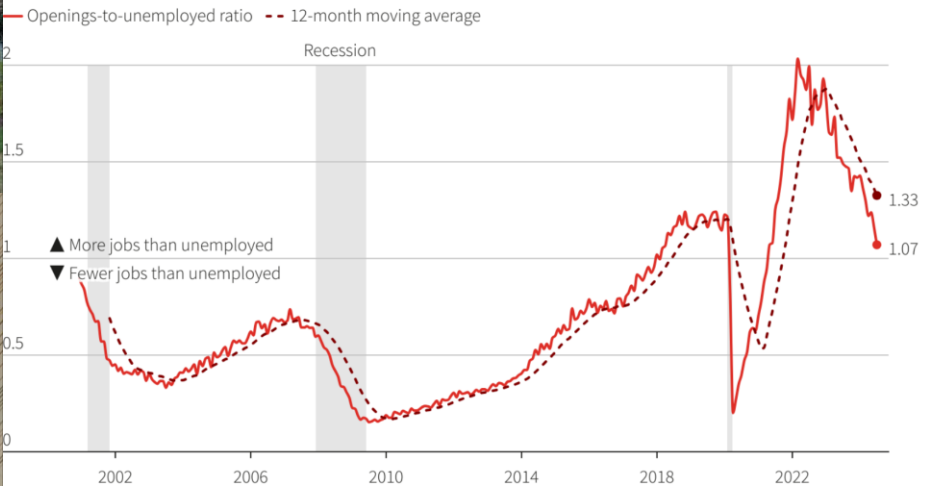
September 5, 2024 3:05 AM GMT+2 · Updated 7 months ago



Financial markets earlier on Wednesday added to bets on an upsized half-point rate cut this month after government data showed U.S. **job openings in July fell** to the lowest level in three and a half years, and the ratio of job openings to job seekers - a metric of labor market tightness -- is now below the pre-pandemic average.

US job vacancies vs jobseekers

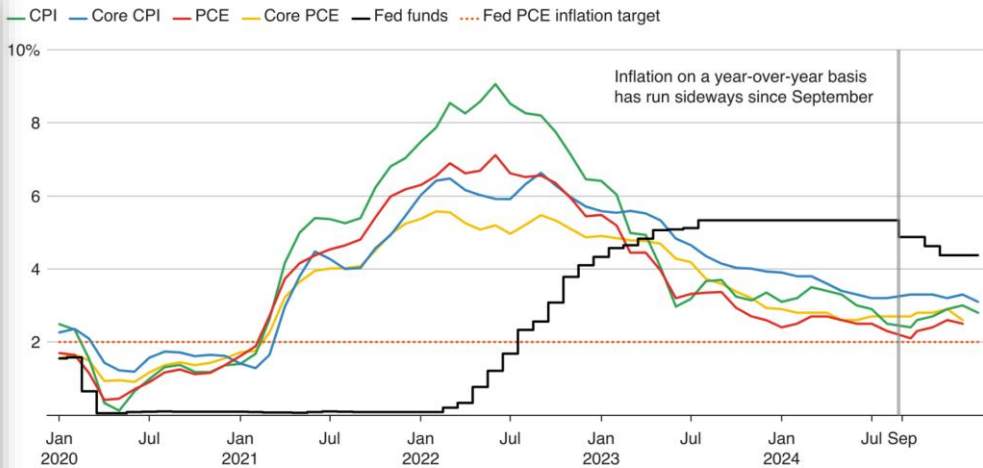
The number of jobs for each jobseeker has been falling consistently since early 2023. It is now below the average during the 12 months prior to the onset of the COVID-19 pandemic.



Source: Bureau of Labor Statistics

Rates and inflation

After raising interest rates by 5.25 percentage points and holding them there for 14 months, the Fed in September cut rates by half a percentage point to account for the drop in inflation, and by another quarter of a percentage point in November and December. It left them unchanged in January and is expected to in March as well.



Note: CPI = Consumer Price Index; PCE = Personal Consumption Expenditures Price Index; Core = excluding food and energy; Fed funds = Fed policy rate

• Source: Federal Reserve (funds rate and target); Bureau of Labor Statistics (CPI); Bureau of Economic Analysis (PCE); inflation rates are annual
Reuters Graphics Reuters Graphics

Most analysts expect the Fed to stick to a quarter-point rate cut at the September meeting, though analysts are keenly awaiting the U.S. Labor Department's August monthly employment report, due on Friday, for any sign of further job market softening that could trigger a bigger Fed response.

Labour market dynamics and the inflation outlook - Remarks by Governor Gabriel Makhoul at University of Galway

21 September 2023 • Speech



Today I will give an overview of recent labour market developments, and why these matter for wages and inflation, drawing on recent projections from the [Central Bank of Ireland](#) and the ECB.

If I was to sum up post-pandemic labour market dynamics in one word it would be resilient. Labour demand has proved resilient, with total employment showing little scarring from the pandemic. Labour supply has also proved resilient. Neither the euro area nor Ireland experienced the large fall in their labour force that we saw in the likes of the US and UK. In fact, the size of the labour force in Ireland is far above pre-pandemic trends.

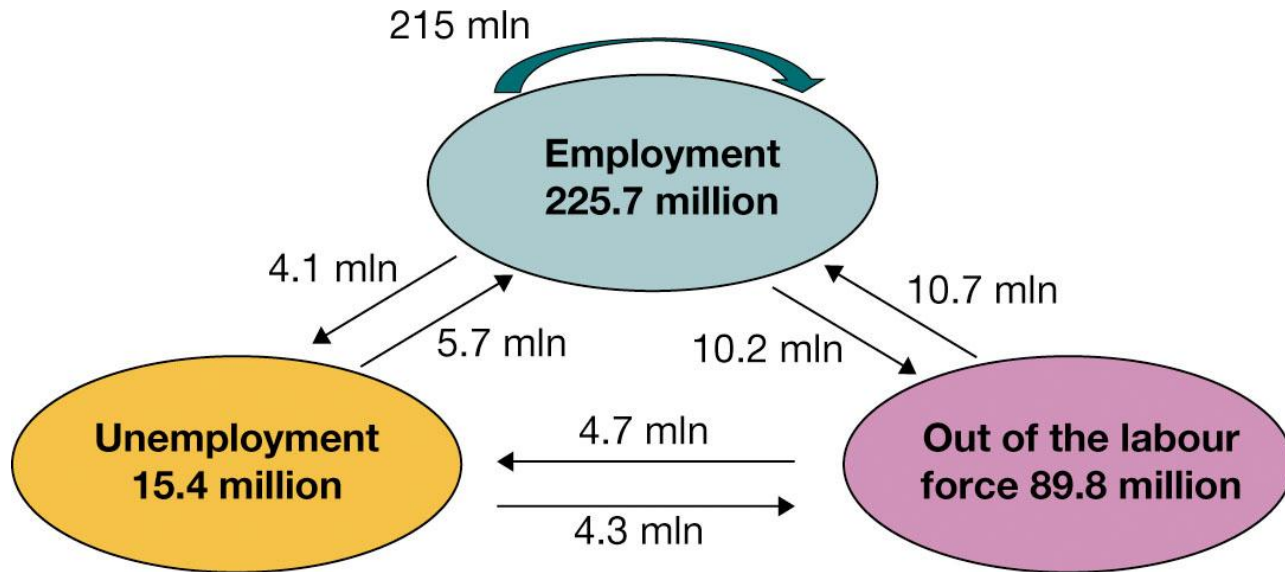
Yet, despite this strong supply response, many firms continue to report labour shortages. And it is this third aspect of resilience that is the decisive one for the current monetary policy outlook, namely the current strong demand for workers, despite the growth slowdown in recent quarters and the sharp tightening of monetary policy over the last year. This is contributing to historically tight labour markets, although we may have passed 'peak tightness', as seen through the recent decline in job openings in some countries, and weaker forward-looking employment indicators.

In the first half of my speech, I will focus on the first two aspects of resilience: strong labour demand and supply. This is important context for the remainder of my speech, where I focus on labour market tightness, wage dynamics and the implications for the inflation outlook. I conclude with an overview of the economic outlook in the recent ECB projections and the Central Bank's Quarterly Bulletin, published earlier this week.

Go through these three articles (the Irish one is perfect)

- <https://www.reuters.com/markets/australia-central-bank-cuts-inflation-forecast-labour-market-still-tight-2025-02-18/>
- <https://www.reuters.com/markets/rates-bonds/feds-daly-says-rate-cuts-needed-keep-labor-market-healthy-2024-09-05/>
- <https://www.centralbank.ie/news/article/speech-labour-market-dynamics-and-the-inflation-outlook-remarks-governor-makhlouf-university-galway-21-sept-2023>

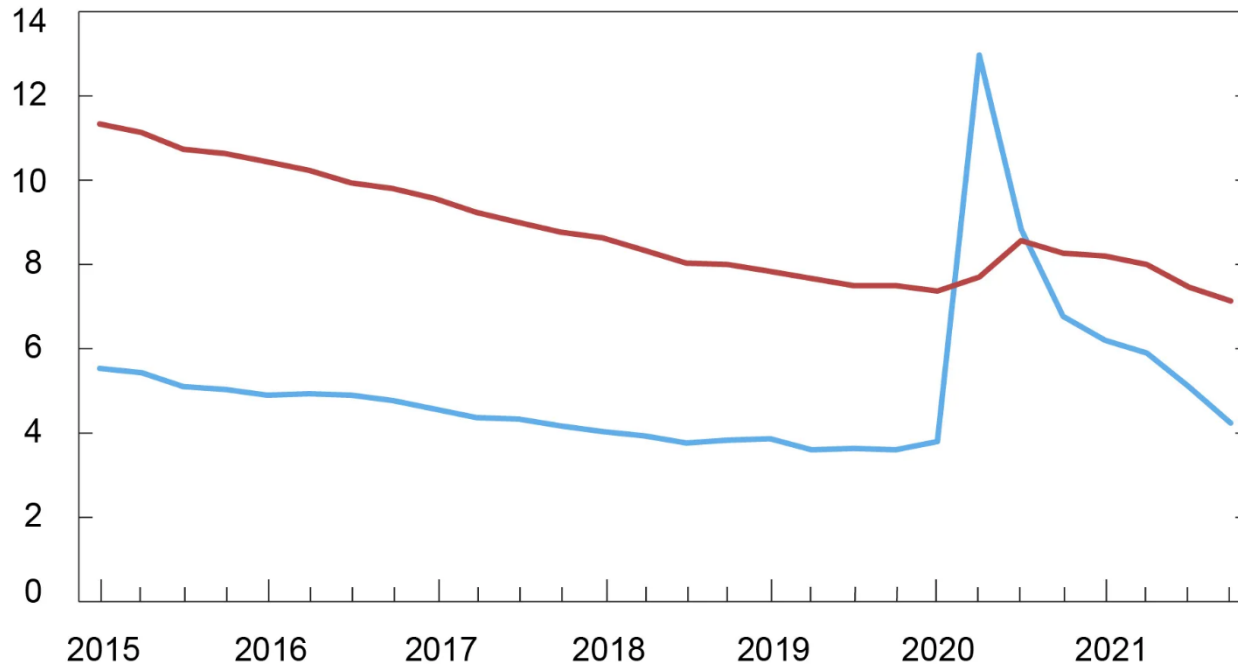
- Average **monthly** flows between employment, unemployment and non-participation in the European Union, 2019



Unemployment rates

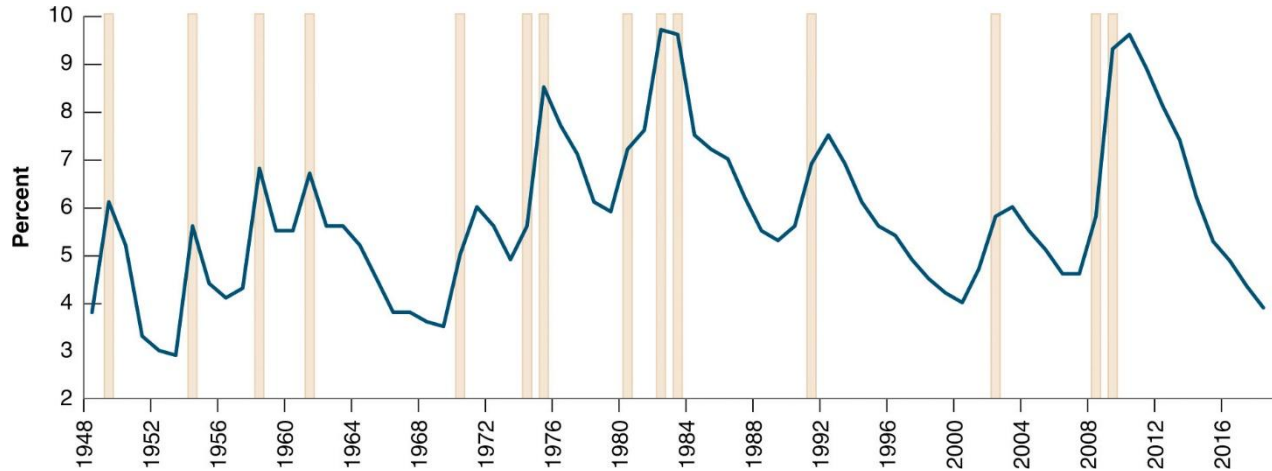
— U.S. — Euro area

Quarterly average (in percent)



Thomas Klitgaard, "How Have the Euro Area and U.S. Labor Market Recoveries Differed?" Federal Reserve Bank of New York, 2022

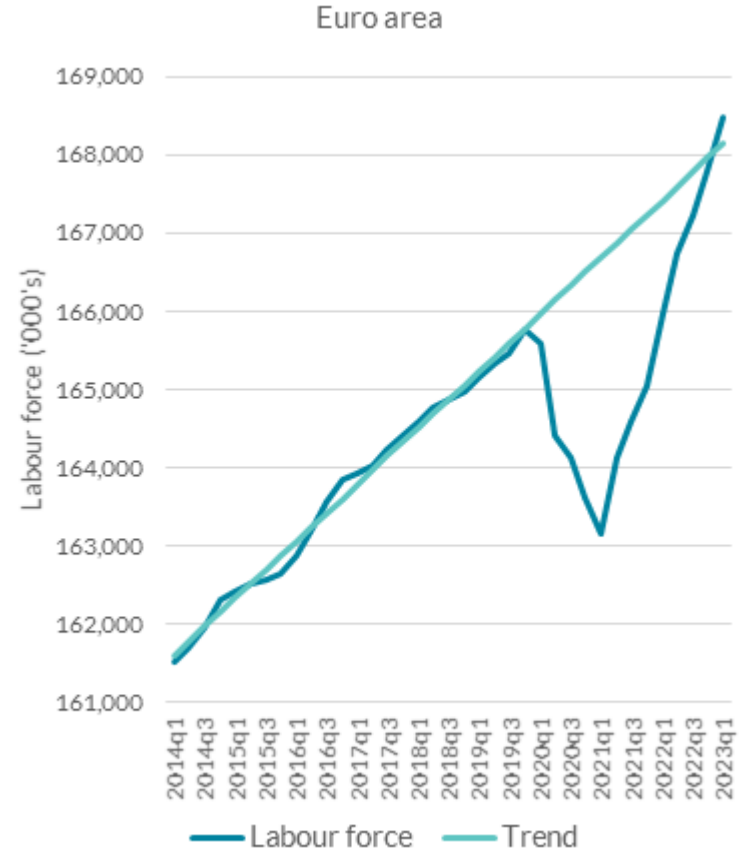
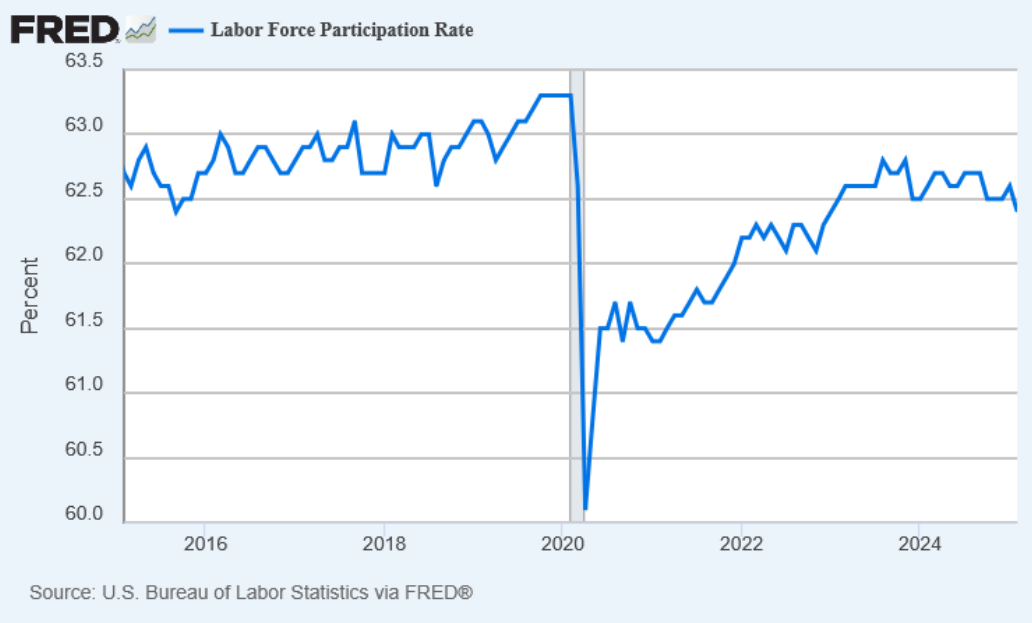
- Large movements in the US unemployment rate during recessions, 1948–2018



Source: Series UNRATE: Federal Reserve Economic Data (FRED), <http://research.stlouisfed.org/fred2/>.

- When unemployment is high, workers are worse off in two ways:
 - Unemployed workers face a lower probability of becoming employed (firms reduce hiring); equivalently, they can expect to remain unemployed for a longer time.
 - Employed workers face a higher probability of becoming unemployed (firms increase layoffs)

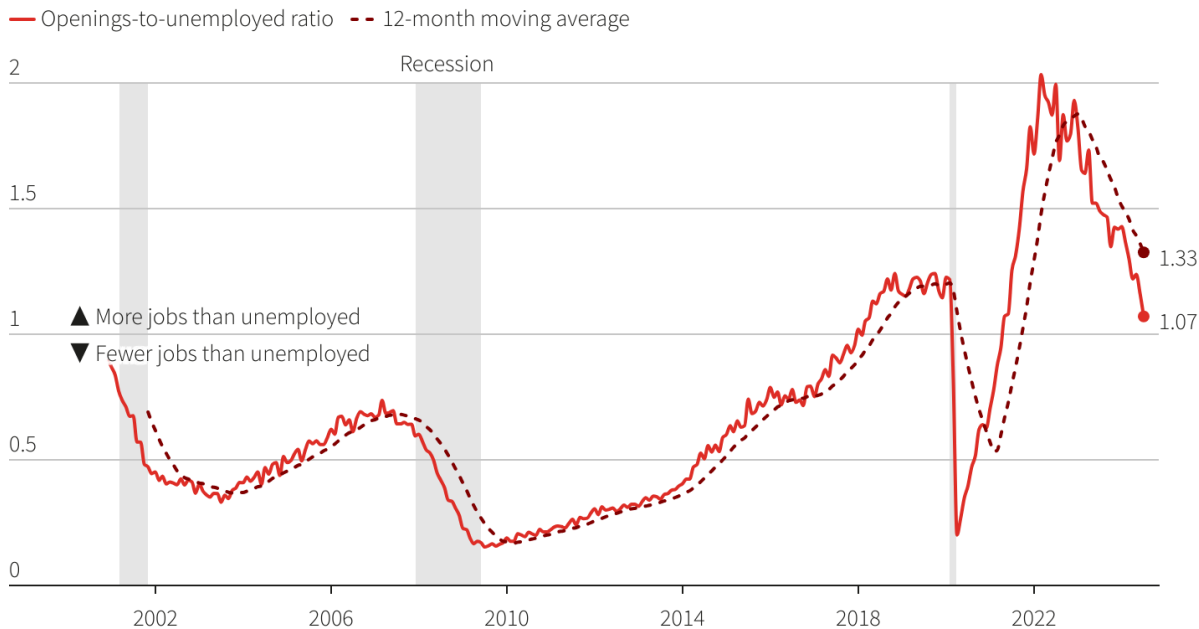
Labour market tightness (demand of labour > supply of labour)



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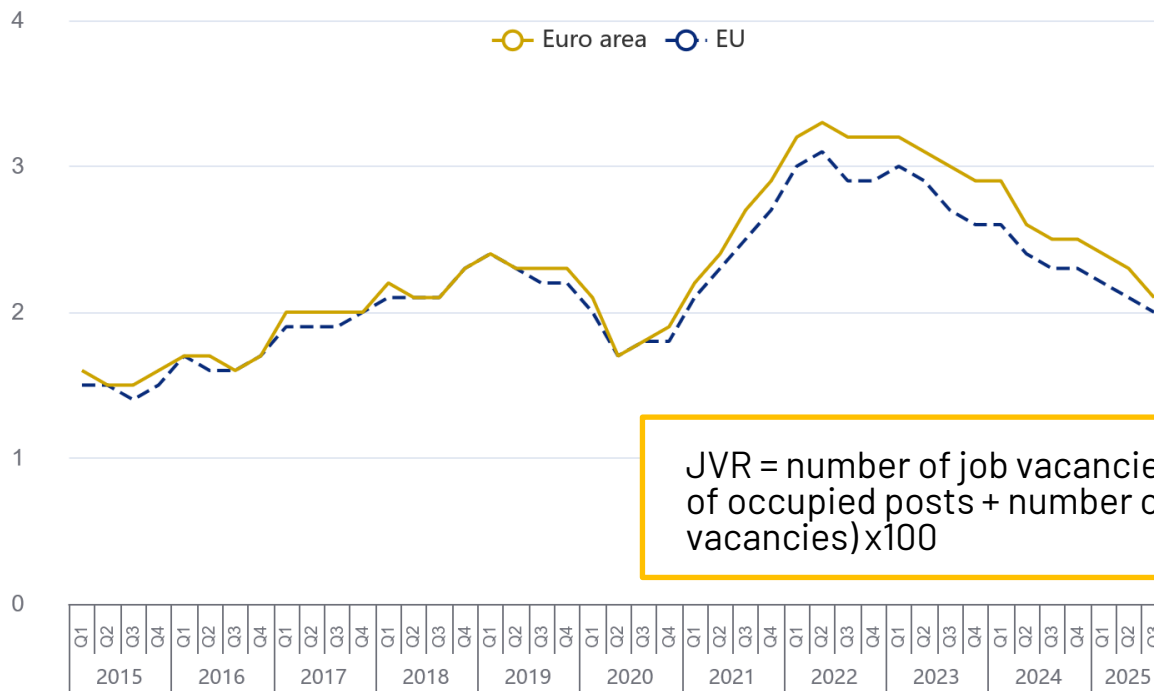


Source: Bureau of Labor Statistics

Labour market tightness (demand of labour > supply of labour)

Job vacancy rates, whole economy

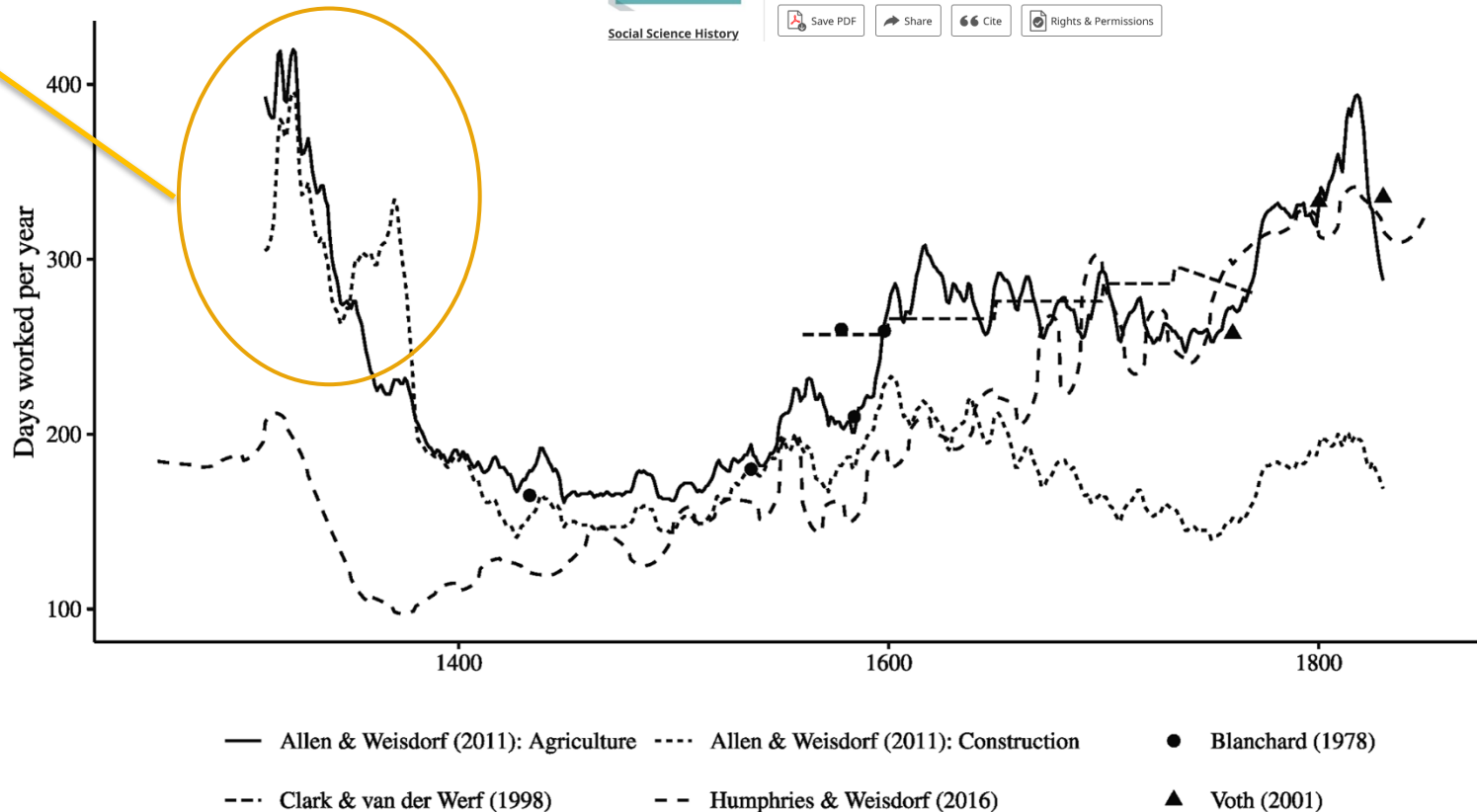
%, not seasonally adjusted



JVR = number of job vacancies / (number of occupied posts + number of job vacancies) x 100

*Was there an ‘industrious revolution’
before the industrial revolution? An
empirical exercise for England,
c. 1300–1830¹*

By R. C. ALLEN and J. L. WEISDORF

Curious? Read
Allen and
Weisdorf 2011

Social Science History

**The Working Week in the Long Nineteenth Century:
Evidence from the Timings of Political Events in Britain**

Published online by Cambridge University Press: 13 January 2022

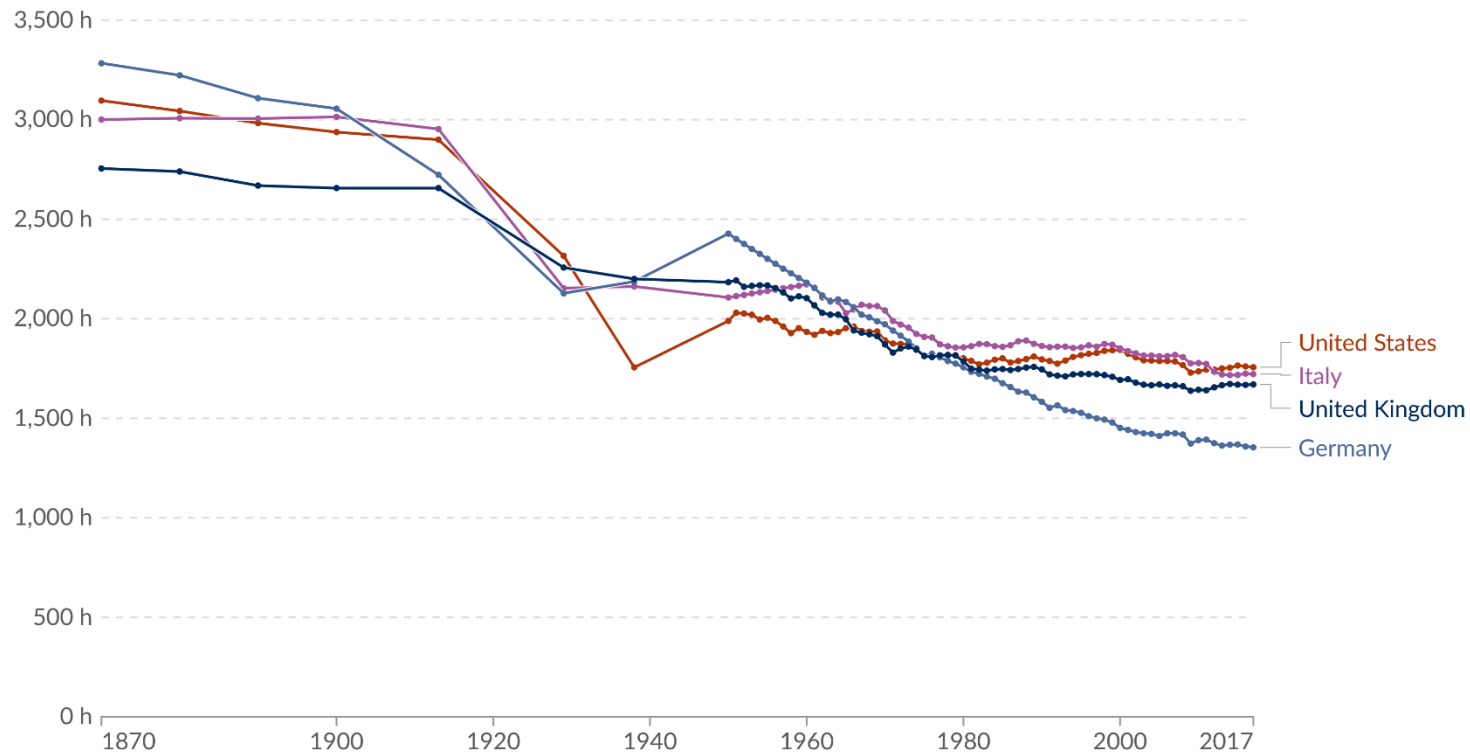
Matteo Tiratelli [ORCID](#)[Show author details](#)

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Annual working hours per worker

Before 1950, the data comes only from full-time production workers (non-agricultural activities). Starting in 1950, estimates cover total hours worked in the economy as measured primarily from National Accounts data.



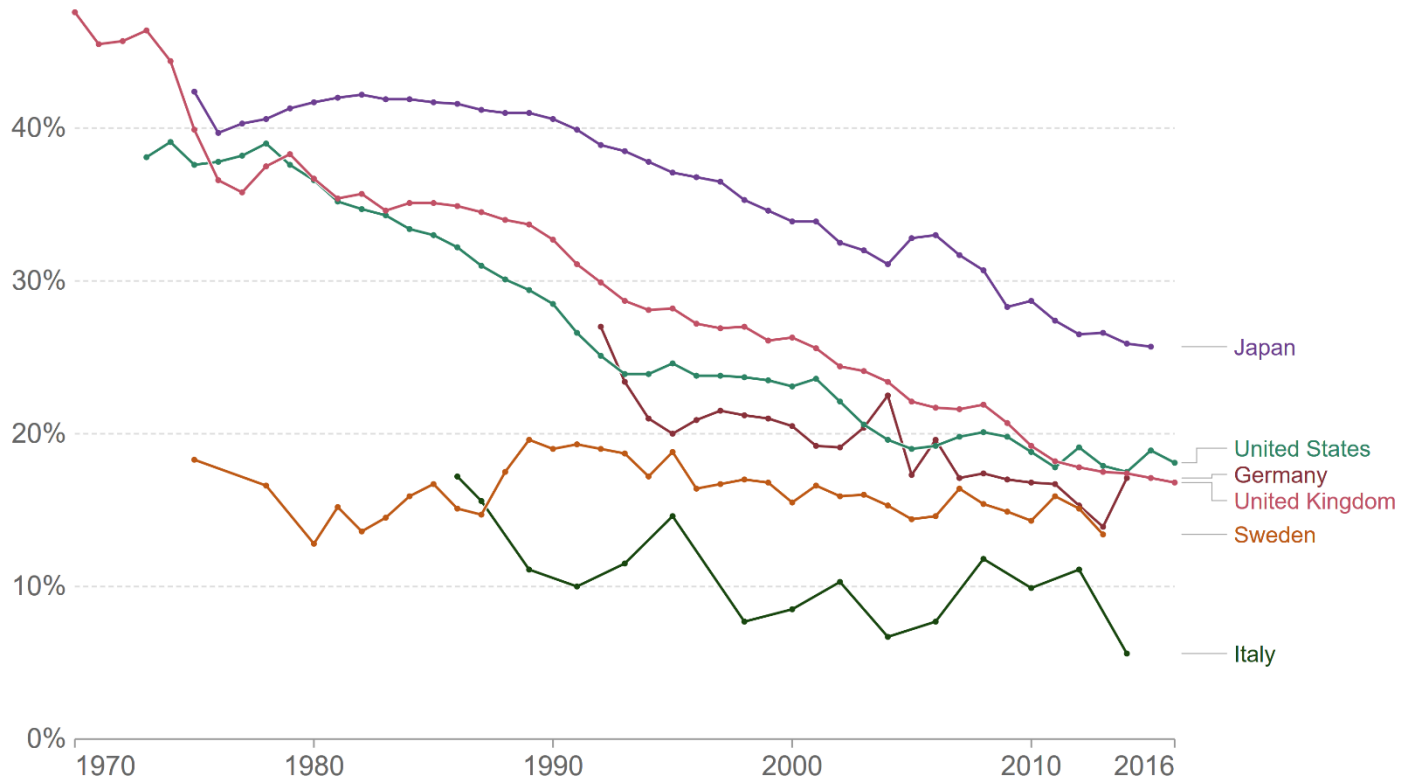
Data source: Huberman & Minns (2007) and PWT 9.1 (2019)

OurWorldinData.org/working-hours | CC BY

Note: We plot the data from Huberman & Minns (2007) and extend coverage using an updated vintage of PWT, which uses the same underlying source. Due to differences in measurement, comparability between countries is limited.

Unadjusted gender gap in median earnings, 1970 to 2016

The gender wage gap is unadjusted and is defined as the difference between median earnings of men and women relative to median earnings of men. Estimates refer to full-time employees and to self-employed.

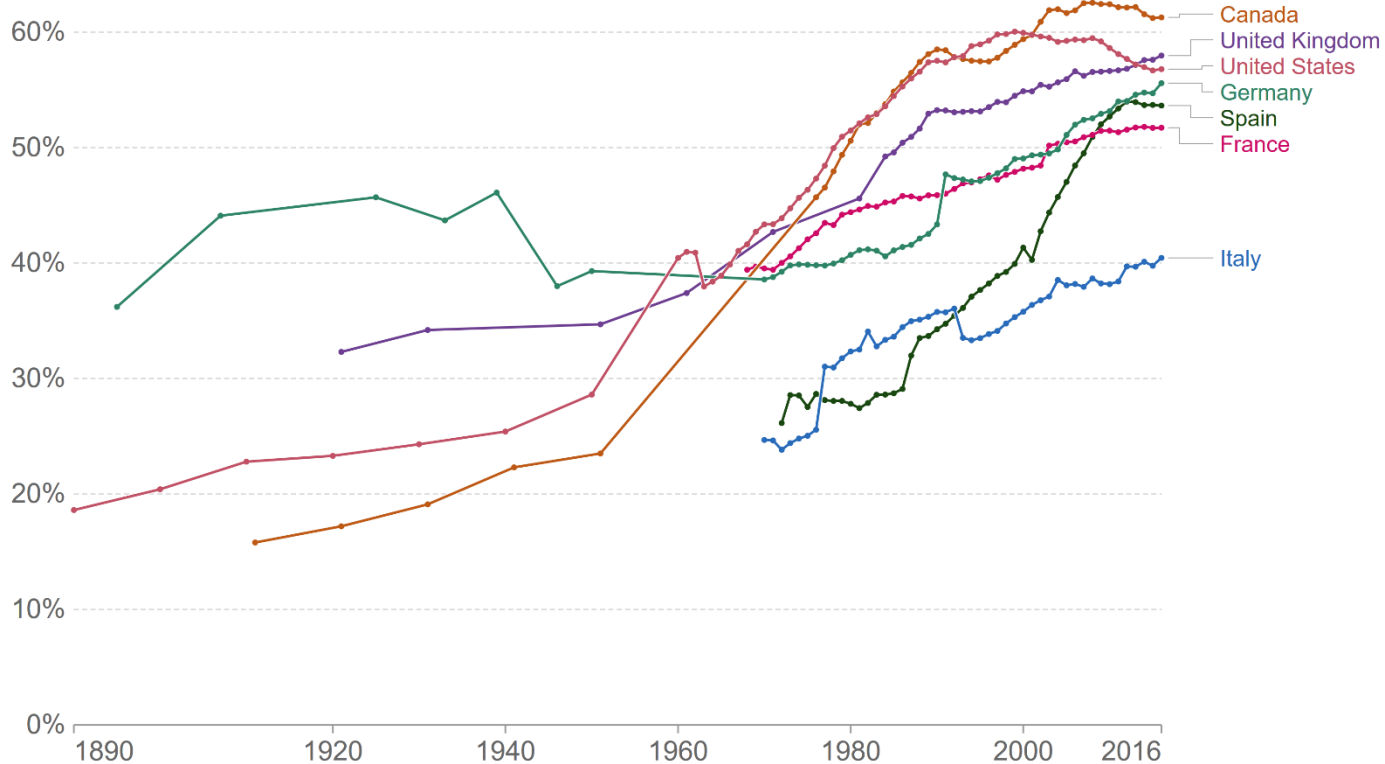


Source: OECD, Gender Wage Gap (2017)

CC BY

Long-run perspective on female labor force participation rates

Proportion of the female population ages 15 and over that is economically active.



Source: Our World In Data based on OECD (2017) and Long (1958)

OurWorldInData.org/female-labor-supply • CC BY

Note: For some observations prior 1960, the participation rate is taken with respect to the female population 14 and over. See sources for details.

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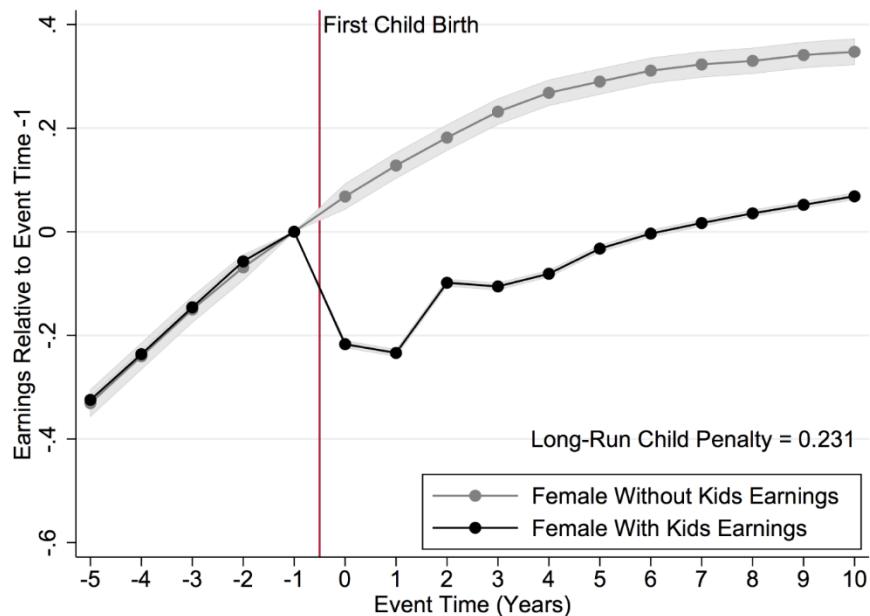
[Home](#) > [Living and working](#) > [Labour market information](#) > Labour Market Information: Italy

Labour Market Information: Italy

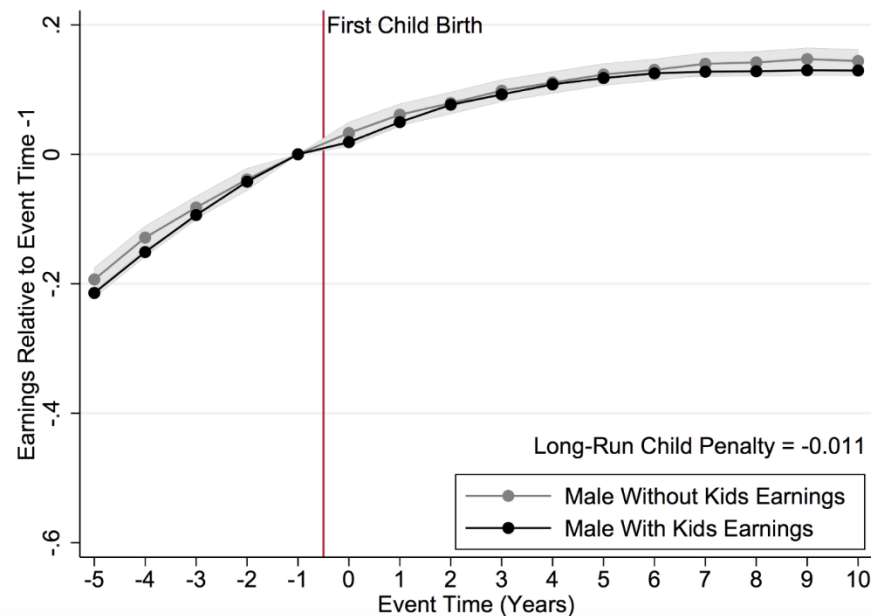
24/02/2025

Impacts of Children in a Difference-in-Differences Event Study Design

A: Women Who Have Children vs Women Who Don't
Earnings Impact



B: Men Who Have Children vs Men Who Don't
Earnings Impact



Source: Henrik Kleven, Camille Landais, and Jakob Egholt Sogaard (2018) – Children and Gender Inequality: Evidence from Denmark. NBER Working Paper No. 24219
 The data visualization is adapted by [OurWorldinData.org](https://www.ourworldindata.org). There you find research and more visualizations on this topic.

THE NATURAL RATE OF UNEMPLOYMENT

Some unemployment is natural.

Over the past 50 years, the national unemployment rate has never dropped below 2.9%.

There are three types of unemployment:

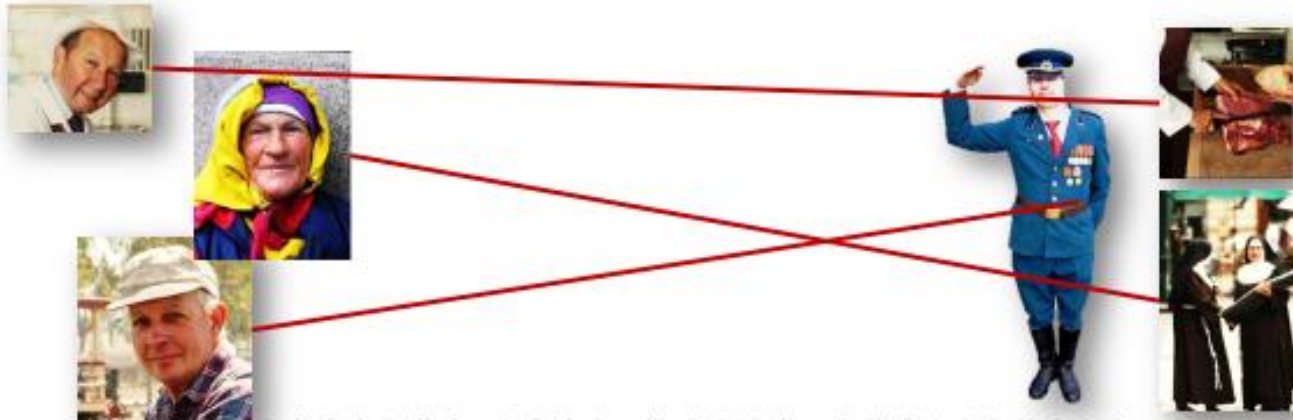
- 1. frictional**
- 2. structural**
- 3. cyclical**

FRICTIONAL UNEMPLOYMENT

Frictional unemployment: unemployment due to the time workers spend in job search.

Scarcity of information creates frictional unemployment.

Matching people to jobs takes time.



STRUCTURAL UNEMPLOYMENT

Structural unemployment: more people are seeking jobs in a particular labor market than there are jobs available at the current wage rate, even when the economy is at the peak of the business cycle.

Some causes:

Labor unions

Efficiency wages

Efficiency wages: wages that employers set above the equilibrium rate as an incentive for better employee performance.

Side effects of government policies

Mismatches between employees and employers

STRUCTURAL UNEMPLOYMENT

Union: an association of workers that bargains collectively with employers over wages, benefits, and working conditions.

Unions take many forms: some act to increase wages simply by restricting entry into a profession with licensing requirements.



CYCLICAL UNEMPLOYMENT

Cyclical unemployment:

unemployment correlated with the business cycle—the deviation from the natural rate.

Lower growth is usually correlated with higher unemployment for two reasons:

- 1. When GDP falls, firms lay off workers.***
- 2. Idle labor and capital → economic growth not being maximized → ↓ ability of the economy to create more jobs.***



Fighting for jobs in the Great Depression

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THE NATURAL RATE OF UNEMPLOYMENT

Frictional and structural unemployment are always present; they are “natural.”

Natural unemployment = frictional unemployment + structural unemployment.

Actual unemployment = natural unemployment + cyclical unemployment.

CHANGES IN THE NATURAL RATE OF UNEMPLOYMENT

We need estimates of the natural rate of unemployment both to make forecasts and to conduct policy analyses.

What causes it to change?

Changes in characteristics of the labor force

Changing demographics

Changes in labor market institutions

Unions, temp agencies, and new technology

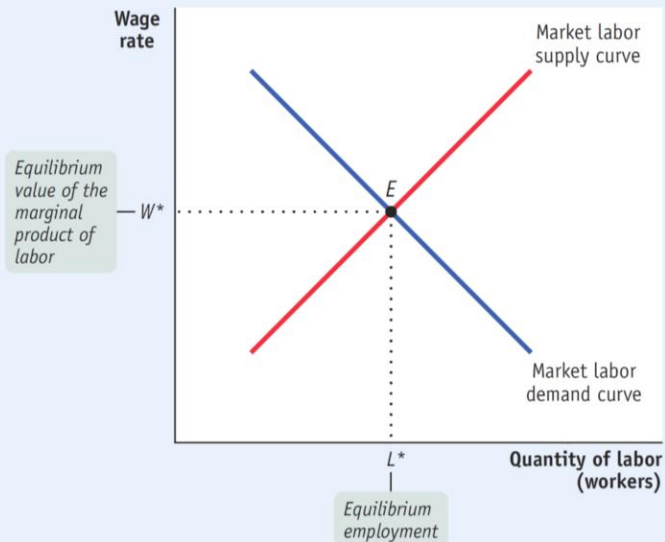
Changes in government policies

Job training programs

The labour market: the familiar model we will NOT use

FIGURE 19-6 Equilibrium in the Labor Market

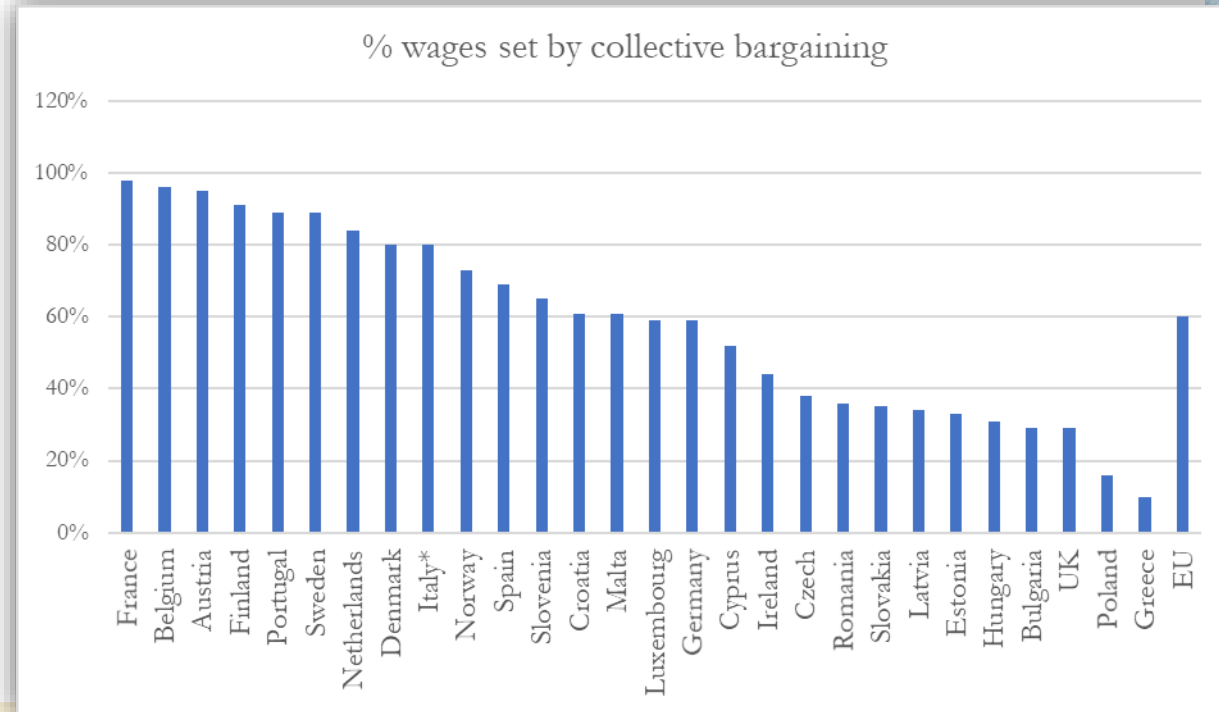
The market labor demand curve is the horizontal sum of the individual labor demand curves of all producers. Here the equilibrium wage rate is W^* , the equilibrium employment level is L^* , and every producer hires labor up to the point at which $VMPL = W^*$. So labor is paid its equilibrium value of the marginal product, the value of the marginal product of the last worker hired in the labor market as a whole.



- We describe the labour market in a more realistic way: the wage-setting and price-setting relations. They are not so different.
- Want to understand why we drop this model? Look at APPENDIX PAGE 164

Wage determination

- Often wages are set by collective bargaining—a bargaining between unions and firms.
- In EU: around 60% of workers' wages are set by collective bargaining.
 - In US, 10%
- An alternative: efficiency wages



- The higher the skills needed to do the job, the more likely there is to be bargaining between employers and individual employees.
- So how what are the factors at play in wage determination?
- Two facts we can start from:
 - most workers are paid a high enough wage that they prefer being employed to being unemployed: workers are typically paid a wage that exceeds their **reservation wage**
 - the wage that would make them indifferent between working or being unemployed
 - Wages typically depend on labour market conditions. The lower the unemployment rate, the higher the wages

Wage determined through bargaining

- It depends on two factors
 - How costly it would be for the firm to find other workers were they to leave the firm.
 - How hard it would be for them to find another job were they to leave the firm
- So workers' bargaining power depends first on the nature of the job
 - Worker in low-skill job can be more easily replaced than in a high-skill job. Think of the difference in the time it takes to teach the skills, and in the number of applicants
- Workers' bargaining power also depends on labour market conditions.
 - When the unemployment rate is low, it is more difficult for firms to find acceptable replacement workers, and easier for workers to find other jobs: stronger bargaining position for higher wage
 - Conversely, when the unemployment rate is high, finding good replacement workers is easier for firms, whereas finding another job is harder for workers: weaker bargaining position for higher wage.

Wage determined through efficiency wage setting

- Firms may want to pay more than the reservation wage. A higher wage can incentivize workers to be more productive and be loyal
- As in the bargaining theories, efficiency wages depend on
 - the nature of the job: high-tech firms, that see employee morale and commitment as essential to the quality of their work, will pay more than firms in sectors where workers' activities are more routine.
 - labour market conditions: a low unemployment rate makes it more attractive for employed workers to quit (easier to find another job)

Model of wage determination

- Wages can be determined through bargaining or through efficiency-wage strategies
- We assume the determined nominal wage W depends on three factors:
 - The expected price level, P^e .
 - The unemployment rate, u .
 - Other variables that we will consider all together

- Prices matter because workers care about real wage, not nominal wage
 - They care about W/P : nominal wages (W) relative to the price (P) of the goods they buy with it.
 - If prices are expected to double, workers will ask for doubling their wage



- Prices matter because firms care about the nominal wages they pay, relative to the price of the goods they sell (P)
 - So, they also care about W/P
 - If firms expect the price level – the price of the goods they sell – to double, they will be willing to double the nominal wage.
- Wages depend on the expected price level (rather than the current price level) because wages are set in nominal (dollar, euro, or other currency) terms and valid for a fixed time (e.g., a year). Once they are set, they are hardly adapted to unexpected changes in prices.
 - You need to bargain on your current wage, based on the expectations you have on future price levels.

- Unemployment matters: the higher unemployment, the lower the wage
 - If wages are determined by bargaining, higher unemployment weakens workers' bargaining power, forcing them to accept lower wages
 - If wages are determined by efficiency wage, higher unemployment allows firms to pay lower wages and still keep workers willing to work
- Other factors pushing wages up (examples)
 - Relevance of unemployment insurance programmes (payment of unemployment benefits to workers who lose their jobs). The size of unemployment benefits raises the reservation wage of workers, hence raising their wage requests.
 - Size of the minimum wage: the higher the minimum wage, the higher might be the reservation wage of workers (hence they would request a higher wage).
 - Employment protection programmes: these make more expensive for firms to lay off workers, hence increasing bargaining power of workers (→ higher wage).

- **Assume that everyone can predict future prices, so $P^e = P$.**

- **A characteristic of the medium run: On average price predictions are correct**

- Then wage determination is $W = P \cdot F(u, z)$
(-)(+)

- Now, because we care about real wage rather than nominal wage, we want to have W/P on the left. We therefore divide both sides by P (to keep the equality sign valid)

$$\frac{W}{P} = F(u, z)$$

(-, +)

REAL-WAGE SETTING RELATION

- The wage-setting relation is the relation between the real wage and the rate of unemployment.
 - The higher the unemployment rate, the lower the real wage chosen during wage setting (could be *bargaining*, or *efficiency-wage*).

$$\frac{W}{P} = F(u, z)$$

(-, +)

REAL-WAGE SETTING RELATION

- Draw it in the space $(u, W/P)$



Goods' prices determination

- The prices set by firms on the goods they produce depend on their costs, which in turn depends on the nature of the production function:
- Let's characterize the production function in a simple way

$$Y = AN$$

- Where Y is output, N is employment and A is labor productivity (output per worker)
 - A is a number: labour productivity is constant
 - Strong simplification: firms use capital (machines, materials...), and A changes over time due to technological process
- The production function is the relation between the inputs used in production and the quantity of output produced, and on the prices of these inputs.

- Assume that each worker produces 1 unit of good: $A = 1$. Then

$$Y = N$$

- So to produce an additional unit, the firm must hire a new worker.
- What is the marginal cost of a unit of production?
 - I have to hire a new worker, paying her the wage W , so the marginal cost is W
- In perfect competition, firms do not set prices: prices are equal to marginal costs. We would have $P = W$
- Many goods markets are not competitive, and firms charge a price higher than marginal costs by adding a **mark-up** factor (m)

$$P = (1 + m)W$$

- The higher the mark-up chosen, the higher the price of the good
- The higher the wage paid, the higher the price of the good

$$P = (1 + m)W$$

- How do draw it together with the wage-setting equation? I need to have W/P on the left

$$\frac{W}{P} = F(u, z)$$

(-, +)

REAL-WAGE SETTING RELATION WS

- I manipulate it: first divide everything by W , then rearrange

$$\frac{P}{W} = (1 + m) \quad \longrightarrow \quad \frac{W}{P} = \frac{1}{(1 + m)}$$

REAL-PRICE SETTING RELATION PS

- This shows us something we were not seeing clearly in the previous slide: price-setting decisions determine the real wage paid by firms
- Suppose firms increase their mark-up (m)
 - increase in prices of goods.
 - If the wage firms pay remains constant, this leads to a decrease in the real wage of workers: You get the same wage, but goods now are more expensive
- Price setting relation can be seen as the amount of real wage firms are willing to supply

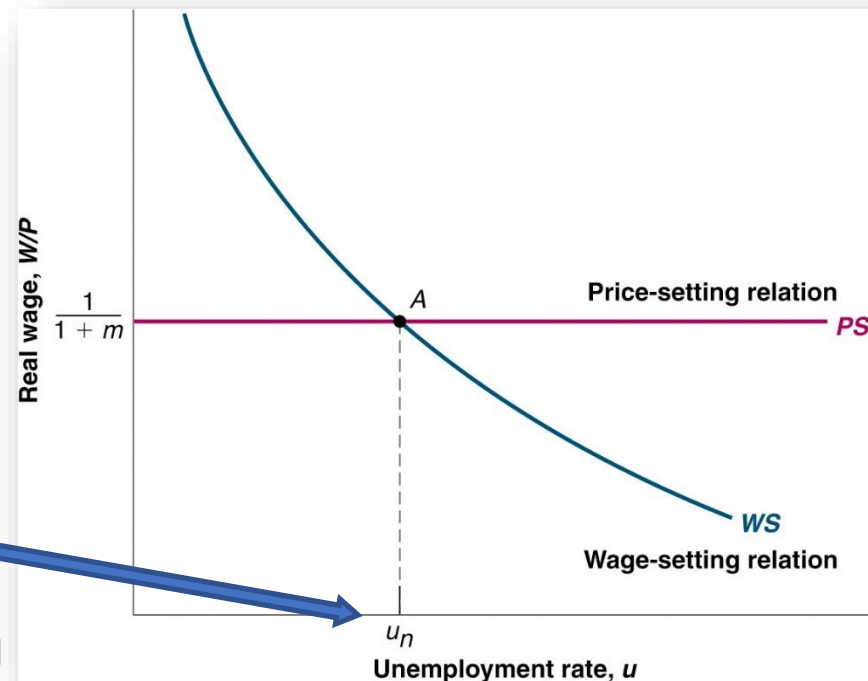
$$\frac{W}{P} = F(u, z)$$

REAL-WAGE SETTING RELATION WS
(-, +)

$$\frac{W}{P} = \frac{1}{(1 + m)}$$

REAL-PRICE SETTING RELATION PS

- Let's draw everything
- Equilibrium in the labour market requires that the real wage chosen in wage setting be equal to the real wage implied by price setting
- Equilibrium in point A
 - Real wage is $1/(1+m)$
 - Unemployment is u_n
- The equilibrium level of unemployment is called **natural unemployment rate**
 - The rate of unemployment such that the real wage chosen in wage setting is equal to the real wage implied by price setting



$$\frac{W}{P} = F(u, z)$$

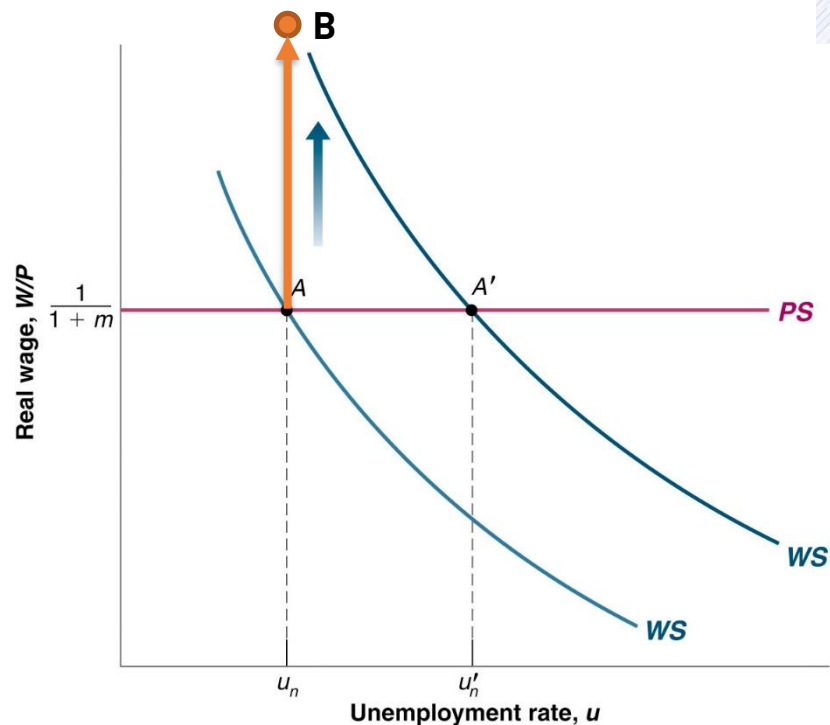
REAL-WAGE SETTING RELATION WS

(-, +)

$$\frac{W}{P} = \frac{1}{(1+m)}$$

REAL-PRICE SETTING RELATION PS

- In equilibrium (A)
 - rate of unemployment = u
 - prices set at a level which implies (real) wage = $1/1+m$.
- What can change this equilibrium in this model?
Changes in z or in m
- **Unemployment benefits increase** (they are in z)
 - z increases, which increases negotiated wages W
 - Start from point A, workers would move to point B
 - z is not on the axis, the WS curve must shift
 - If firms do not wish to adjust their prices, they still want to offer the same real wage as before ($1/1+m$). NO EQUILIBRIUM (point B)
 - Workers demands are too high for firms, who stop hiring or start laying off workers → unemployment increases
 - With higher unemployment workers are less powerful and their Wage requests decline until we are back in equilibrium
- The new equilibrium is characterised by a higher "natural" level of unemployment A'



$$\frac{W}{P} = F(u, z)$$

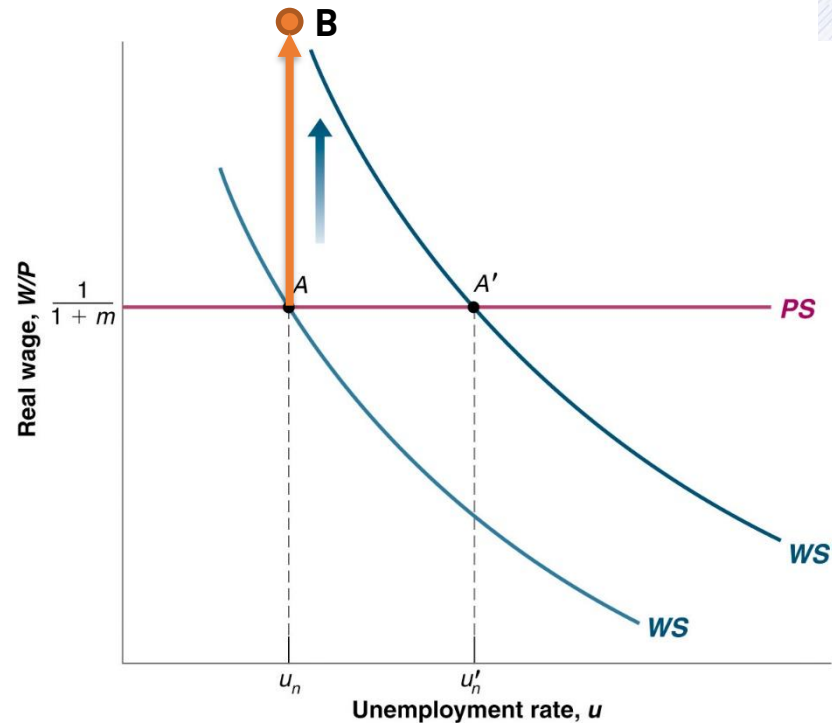
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REAL-WAGE SETTING RELATION WS

$$\frac{W}{P} = \frac{1}{(1 + m)}$$

REAL-PRICE SETTING RELATION PS

- **Unemployment benefits increase** (they are in z)
- The new equilibrium is characterised by a higher “natural” level of unemployment A'
- But recall that production $Y = N$.
- If an increase in unemployment benefits leads to higher unemployment, this likely means lower employment \rightarrow lower production



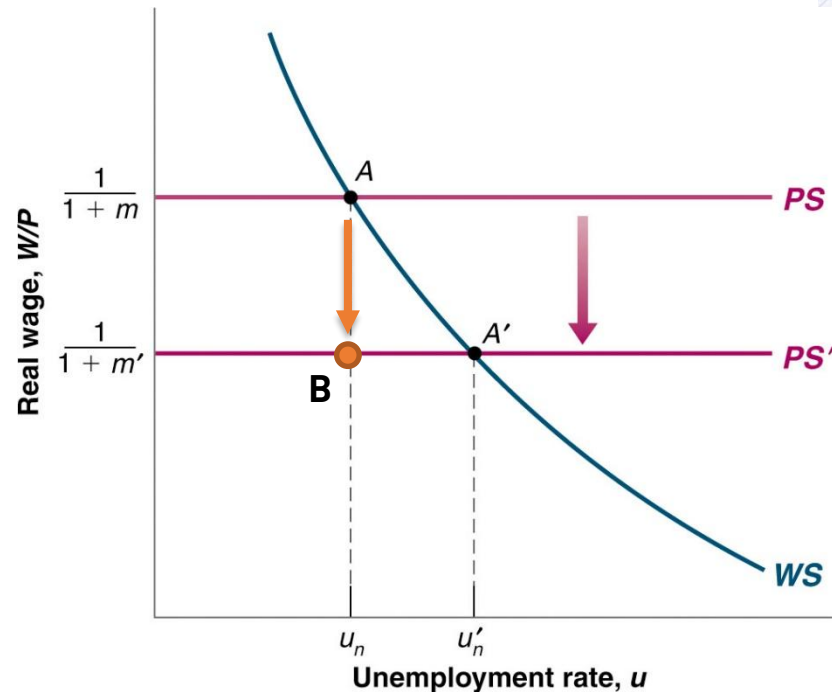
$$\frac{W}{P} = F(u, z)$$

REAL-WAGE SETTING RELATION WS
(-, +)

$$\frac{W}{P} = \frac{1}{(1 + m)}$$

REAL-PRICE SETTING RELATION PS

- In equilibrium (A)
 - rate of unemployment = u
 - prices set at a level which implies (real) wage = $1/1+m$.
- **A law introduces less stringent enforcement of antitrust legislation**, allowing firms to collude more easily and increase their market power
 - Mark-up m increases \rightarrow higher prices \rightarrow lower real wage offered by firms (ex., from A to B)
 - m is not on the axes, the PS curve must shift
 - workers negotiated a real wage $1/1+m$, but now firms offer a lower wage $1/1+m'$. We are in B, NO EQUILIBRIUM
 - How can workers accept a lower real wage? Only if unemployment is higher (as in previous slide)
- New equilibrium will be in A', with higher u_n



Assume $P^e = P$ in wage setting

$$\frac{W}{P} = F(u, z)$$

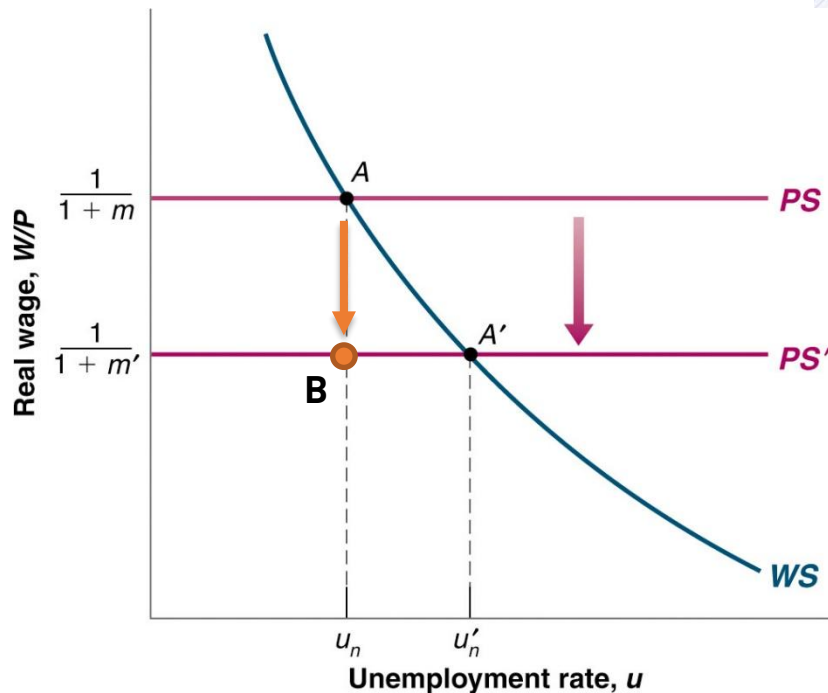
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REAL-WAGE SETTING RELATION WS

$$\frac{W}{P} = \frac{1}{(1 + m)}$$

REAL-PRICE SETTING RELATION PS

- **A law introduces less stringent enforcement of antitrust legislation**, allowing firms to collude more easily and increase their market power
- New equilibrium will be in A' , with higher u_n
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Assume $P^e = P$ in wage setting

Differences between short- and middle-run frameworks

- In studying labour market, we have assumed that the price level is equal to the expected price level. This is realistic in the medium-run.

Assume $P^e = P$ in wage setting

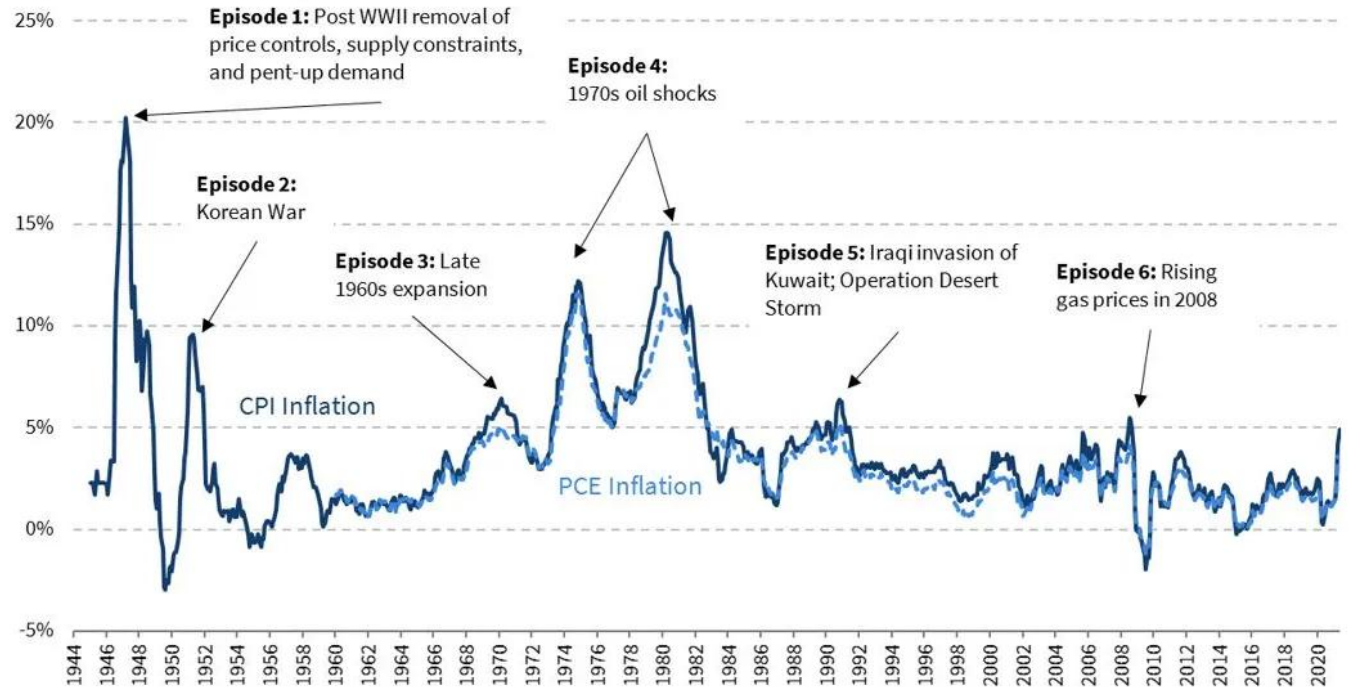
- In analytic form: $W = P^e \cdot F(u, z)$
(-) (+)
- P^e = expected price level in the future.
 - In the short run, it is hard to predict how prices will move.
 - In the medium run, prices trends are more predictable. Let's start by assuming that we can perfectly predict it.

- In the short run, the price level may well turn out to be different from what is expected when nominal wages are set, so that unemployment is not necessarily equal to the natural rate or output equal to its natural level.
 - In the short run, output is determined by all of the factors discussed in previous classes
- Because expectations are unlikely to be systematically wrong, in the medium run, output tends to return to its natural level.
 - In the medium run, output is much more dependent on labour market conditions than in the short-run
- Let's now relax the assumption that the price level is equal to the expected price level.

- Inflation tends to be more stable in the medium run. In the short-run it fluctuates more

Figure 1: Six episodes of post-WWII inflation

Percentage change, year-over-year



Source: Federal Reserve Economic Data (FRED), Haver Analytics, CEA Calculations.



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