DANMARKS
NATIONALBANK

EPRN Conference

Renato Faccini and Pernille Borgensgaard

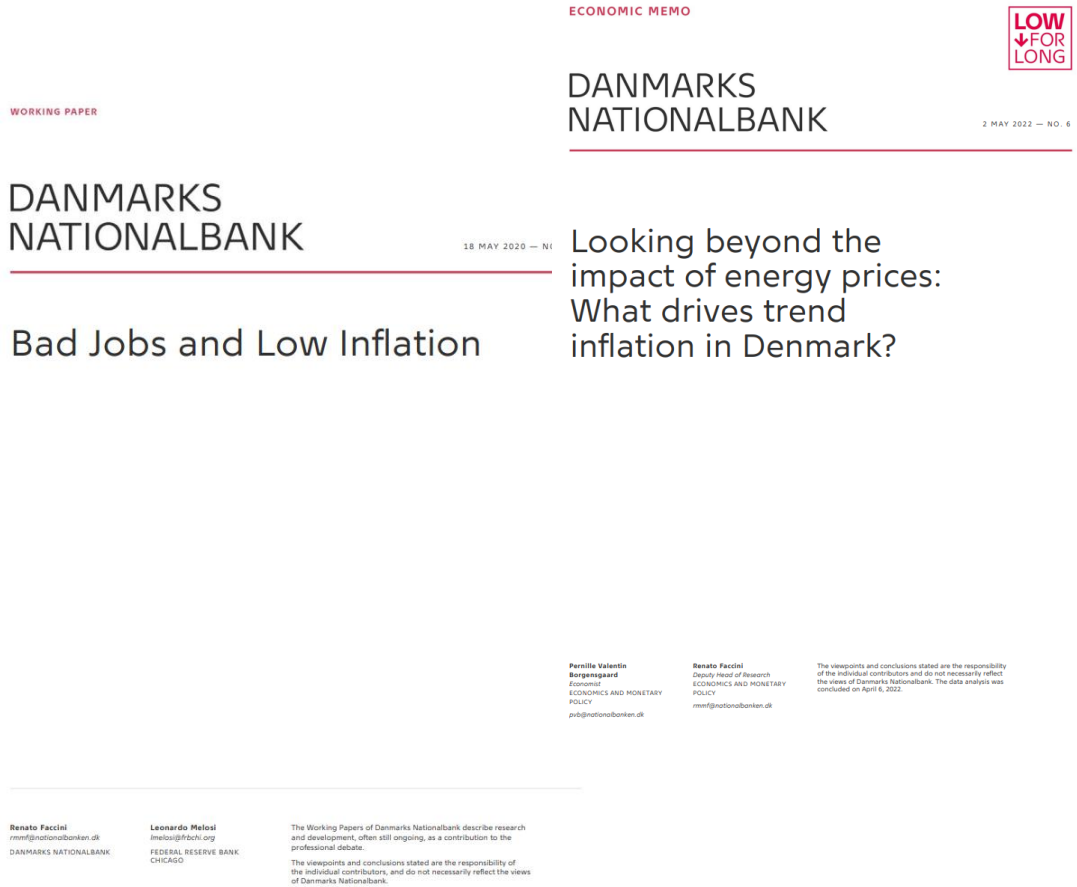
Overview

Bad Jobs and Low Inflation (2020)

- Renato Faccini and Leonardo Melosi.
- Danmarks Nationalbank Working Paper No.155.

Looking Beyond the Impact of Energy Prices: What Drives Trend Inflation in Denmark? (2022)

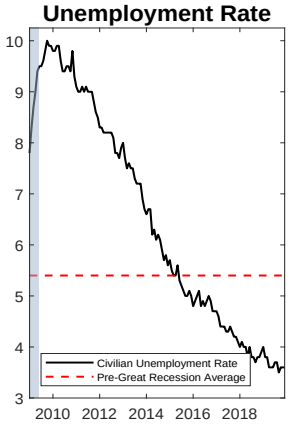
- Pernille Borgensgaard and Renato Faccini.
- Danmarks Nationalbank Economic Memo No. 6.

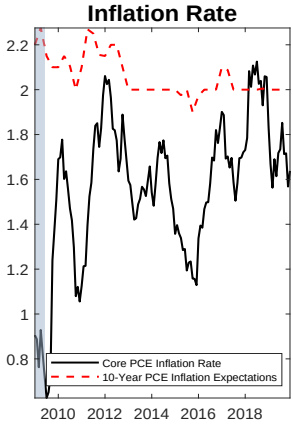


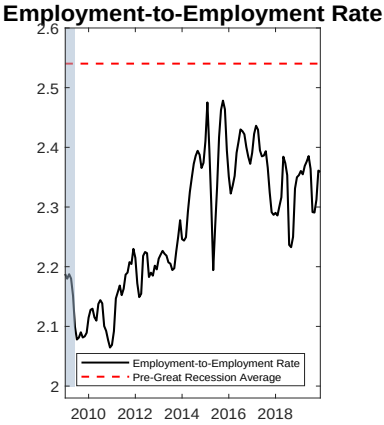
Bad Jobs and Low Inflation

Faccini and Melosi (2020)

Motivation


Unemployment Rate
10
9
8
7
6
5
4
3
2010
2012
2014
2016
2018
Civilian Unemployment Rate
Pre-Great Recession Average


Inflation Rate
2.2
2
1.8
1.6
1.4
1.2
1
0.8
2010
2012
2014
2016
2018
Core PCE Inflation Rate
10-Year PCE Inflation Expectations


Employment-to-Employment Rate
2.6
2.5
2.4
2.3
2.2
2.1
2
2010
2012
2014
2016
2018
Employment-to-Employment Rate
Pre-Great Recession Average

The Paper

We develop a model that is consistent with these facts

The story: Employed workers searched less so inflation fell

Mechanism: By searching on the job, employed workers spark wage competition

Plan of the Talk

1. The essence of the model
2. How to derive a model-implied series for the rate of on-the-job search
3. A model-based indicator of inter-firm wage competition

The model: ingredients

1. Textbook NK model: Monopolistically competitive firms differentiate a homogeneous good subject to price rigidities.
2. Search and matching in producing homogeneous good
3. Employed workers search on the job with exog. prob. s_t
4. Two types of jobs: good and bad
5. Unemployed workers have zero bargaining power
6. Betrand competition to hire employed workers (Postel-Vinay and Robin, ECMA 2002)

One Key Equation: The Free-Entry Condition

$$c^f + \frac{c}{\varpi_t} = \frac{u_{0,t}}{u_{0,t} + s_t(1-u_{0,t})}\left[\xi_b S_t(y_b) + \xi_g S_t(y_g)\right] + \frac{s_t(1-u_{0,t})}{u_{0,t} + s_t(1-u_{0,t})}\xi_g \frac{l^0_{b,t}}{l^0_{b,t} + l^0_{g,t}}\left[S_t(y_g) - S_t(y_b)\right]$$

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It can be shown that surpluses $S_t(y)$ grow linearly with $\mathcal{W}_t$:

$$S_t(y) = y \cdot \mathcal{W}_t - \frac{b\lambda_t^{-1}}{1-\beta(1-\delta)}$$

$$\mathcal{W}_t = \varphi_t + (1-\delta)\ \beta E_t \frac{\lambda_{t+1}}{\lambda_t}\ \mathcal{W}_{t+1}$$

Surpluses | Back to Model Properties | Back to IRF

An Index of Inter-Firm Wage Competition

$$c^f + \frac{c}{\varpi_t} = \frac{u_{0,t}}{u_{0,t} + s_t\left(1 - u_{0,t}\right)}\left[\xi_b S_t\left(y_b\right) + \xi_g S_t\left(y_g\right)\right] + \frac{s_t\left(1 - u_{0,t}\right)}{u_{0,t} + s_t\left(1 - u_{0,t}\right)}\xi_g \frac{l^0_{b,t}}{l^0_{b,t} + l^0_{g,t}}\left[S_t\left(y_g\right) - S_t\left(y_b\right)\right]$$

An Index of Inter-Firm Wage Competition

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The probability that **firms extract no surplus due to wage competition**

$$\Sigma_t \equiv 1 - \left[\frac{u_{0,t}}{u_{0,t} + s_t(1-u_{0,t})} + \frac{s_t(1-u_{0,t})}{u_{0,t} + s_t(1-u_{0,t})}\frac{l^0_{b,t}}{1-u_{0,t}}\xi_g\right]$$

An Index of Inter-Firm Wage Competition

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Three variables matter: $u_{0,t}$, s_t, $l^0_{b,t}$.

An Index of Inter-Firm Wage Competition

- **A lower probability implies less intense wage competition to hire a worker**
- The expected profit from posting a vacancy rises $\rightarrow$ **the relative price of the homogeneous good, φ_t falls to satisfy the free-entry condition**

$\Longrightarrow$ Real marginal costs fall and inflation drops

Two model properties

- The linearized Free Entry can be expressed as Phillips curve:

$$\hat{\pi}_t = a_1 \hat{u}_t + a_2 \hat{s}_t + a_3 \hat{l}_{b,t} \tag{1}$$

- The linearized index of IFC approximates π_t:

$$\hat{\Sigma}_t \approx \hat{\pi}_t \tag{2}$$

- Eq.(2) $\implies$ $\hat{\pi}_t$ can be derived without solving the model

Identification of Labor Market Variables

- Observing the EE rate allows us to pin down the on-the-job search rate s_t:

$$EE_t \equiv s_t \times \underbrace{\phi_t}_{UE_t} \times \left[\underbrace{\frac{l^0_{b,t}}{l^0_{b,t} + l^0_{g,t}} \xi_g}_{\text{Switches to better jobs}} + \underbrace{\frac{l^0_{b,t}\xi_b + l^0_{g,t}\xi_g}{l^0_{b,t} + l^0_{g,t}} \upsilon}_{\text{Lateral switches}} \right]$$

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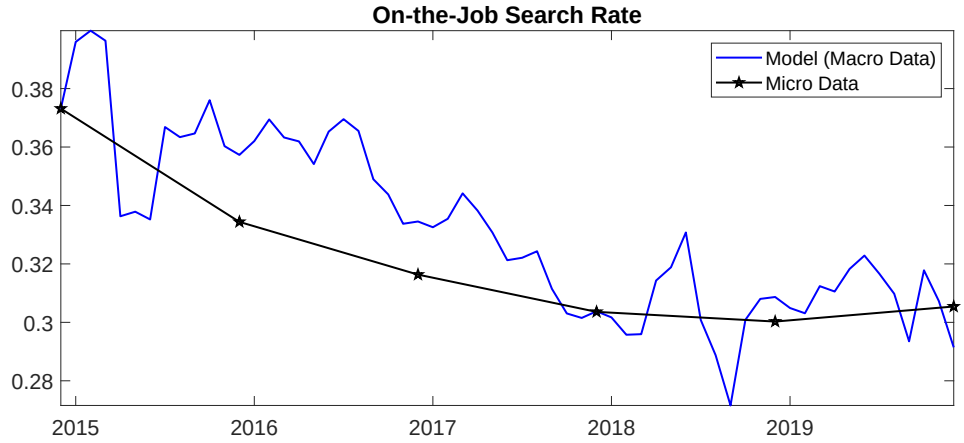
- The shares of bad and good matches are predetermined:

$$l^0_{b,t+1} = (1-\delta)\left[(1-s_t\phi_t\xi_g)\, l^0_{b,t} + \phi_t\xi_b u_{0,t}\right]$$

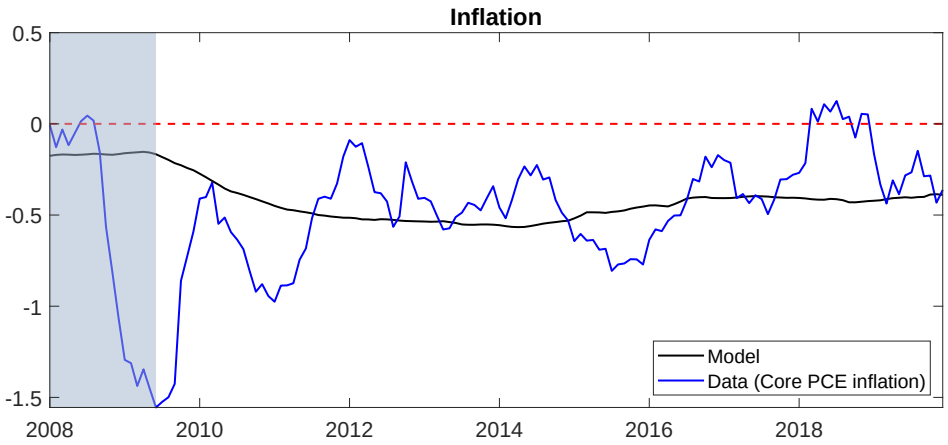
$$l^0_{g,t+1} = (1-\delta)\left[l^0_{g,t} + s_t\phi_t\xi_g l^0_{b,t} + \phi_{t-1}\xi_g u_{0,t}\right]$$

Micro Evidence: The On-the Job Search Rate



Endogenous OJS

Explaining the Missing Inflation Puzzle



Off-the-shelf Proxy for MC

Looking Beyond the Impact of Energy Prices: What Drives Trend Inflation in Denmark?

Borgensgaard and Faccini (2022)

Have the same forces constrained wage and price inflation in Denmark?

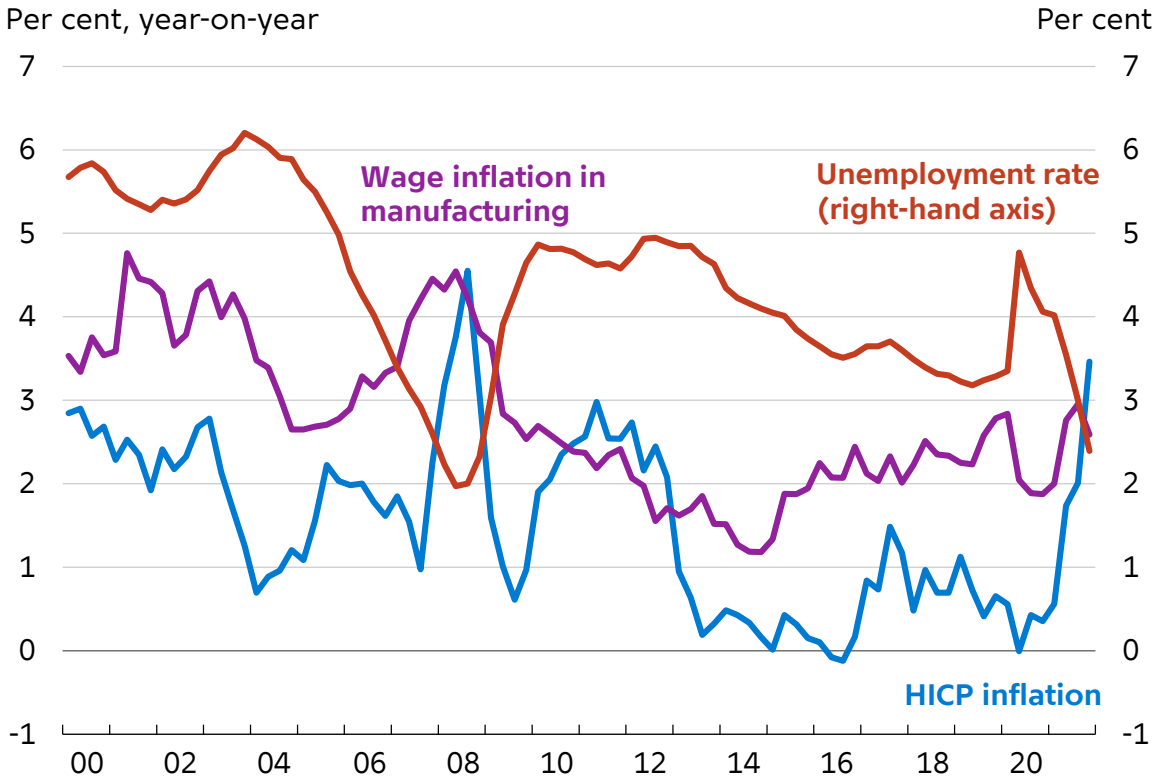
Motivation

- Disconnect between inflation and UE rates is an international phenomenon.
- In Denmark, wage growth has also become increasingly disconnected from the unemployment gap since the GFC (Kristoffersen, 2018).
- The search behaviour of the employed seems to better capture the development in inflation in the US (Faccini and Melosi, 2020).

Idea

- Replicate analysis of Faccini and Melosi (2020) on Danish register data.

Low inflationary pressures in Denmark before the pandemic despite fall in the unemployment rate



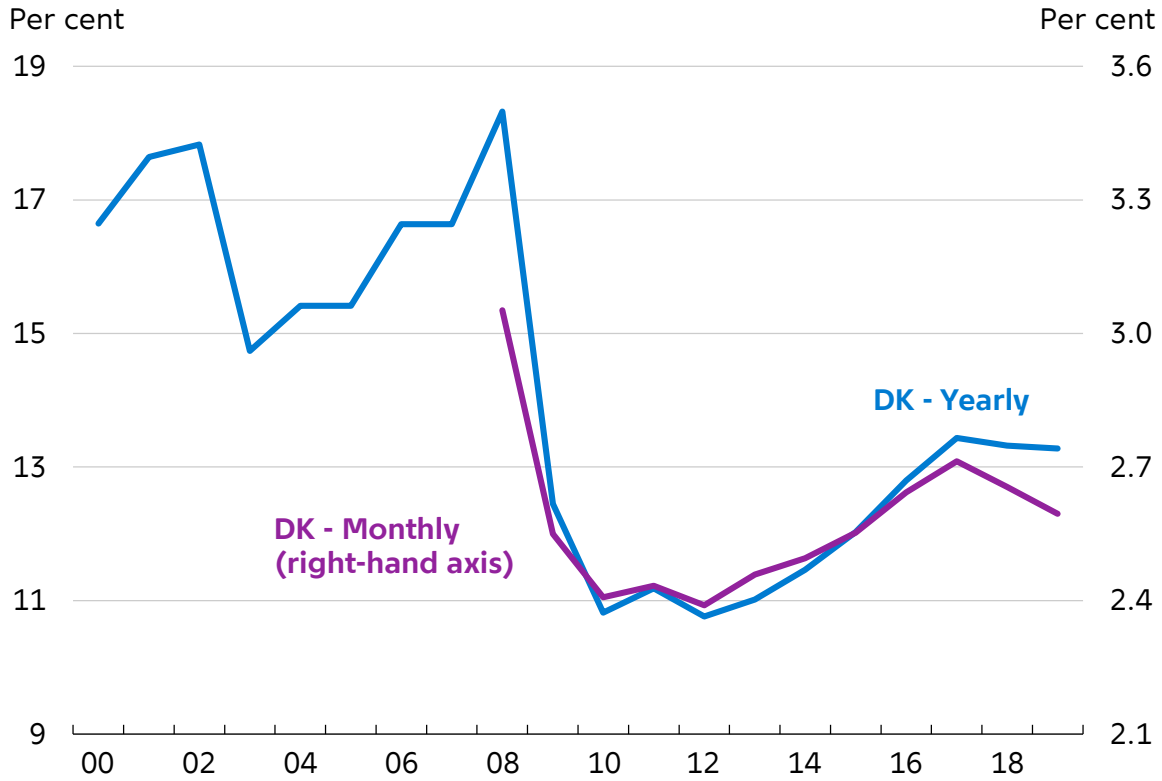
Note: Unemployment consists of recipients of unemployment benefits and recipients of social benefits including those in activation.
Source: Statistics Denmark and own calculations.

Data

- Combine monthly and yearly information on employment-to-employment (EE) transition rates for wage earners.
  - Monthly series is available from February 2008 to September 2021.
  - Yearly series is available from 2000 to 2019.
- An EE transition is defined as a change in firm identifiers of the main job between the current and previous months/years.
  - For the yearly measure, we condition on zero unemployment during the year.
- We obtain a quarterly series of EE transition rates by…
  1. …taking averages of monthly EE transition rates from April 2008 onwards and…
  2. …linearly interpolating it backwards using growth rates of the yearly EE transition rates.

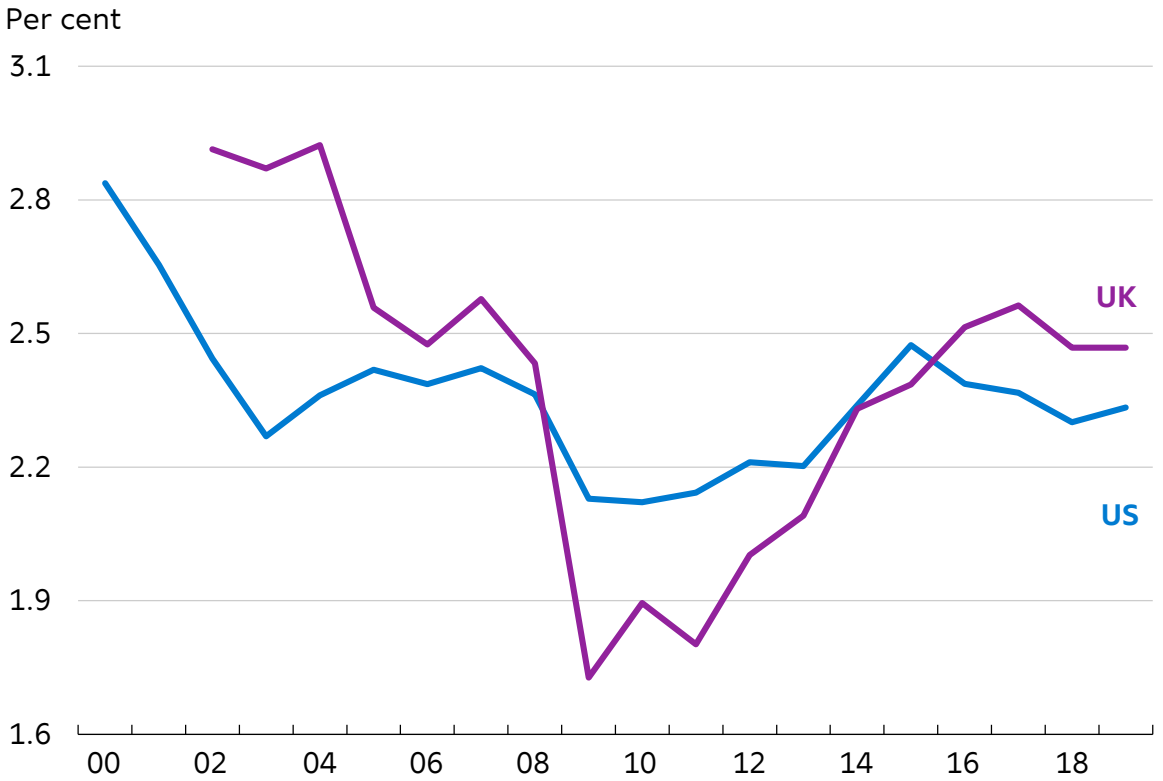
Wage earners have become less likely to change employers after the Great Financial Crisis

Employment-to-employment transition rates have fallen in Denmark…



Note: The growth rate of the yearly employment-to-employment transition rate is set to zero in 2005 and 2007 due to structural breaks in the data.
Source: Own calculations based on register data from Statistics Denmark.

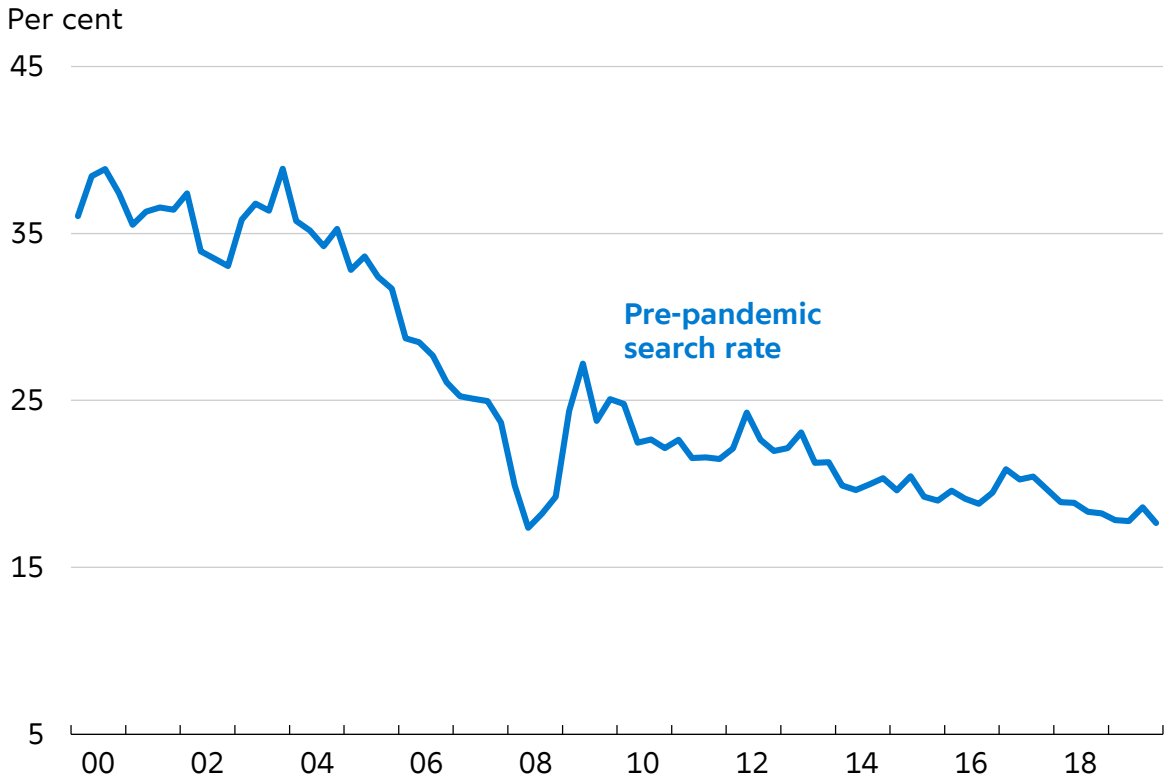
… and in other advanced countries



Note: Average monthly and quarterly shares of employed having an employment-to-employment transition in the UK (aged 16 to 69 years) and the US, respectively.
Source: Office for National Statistics, by Fujita, Moscarini and Postel-Vinay (2021), and own calculations.

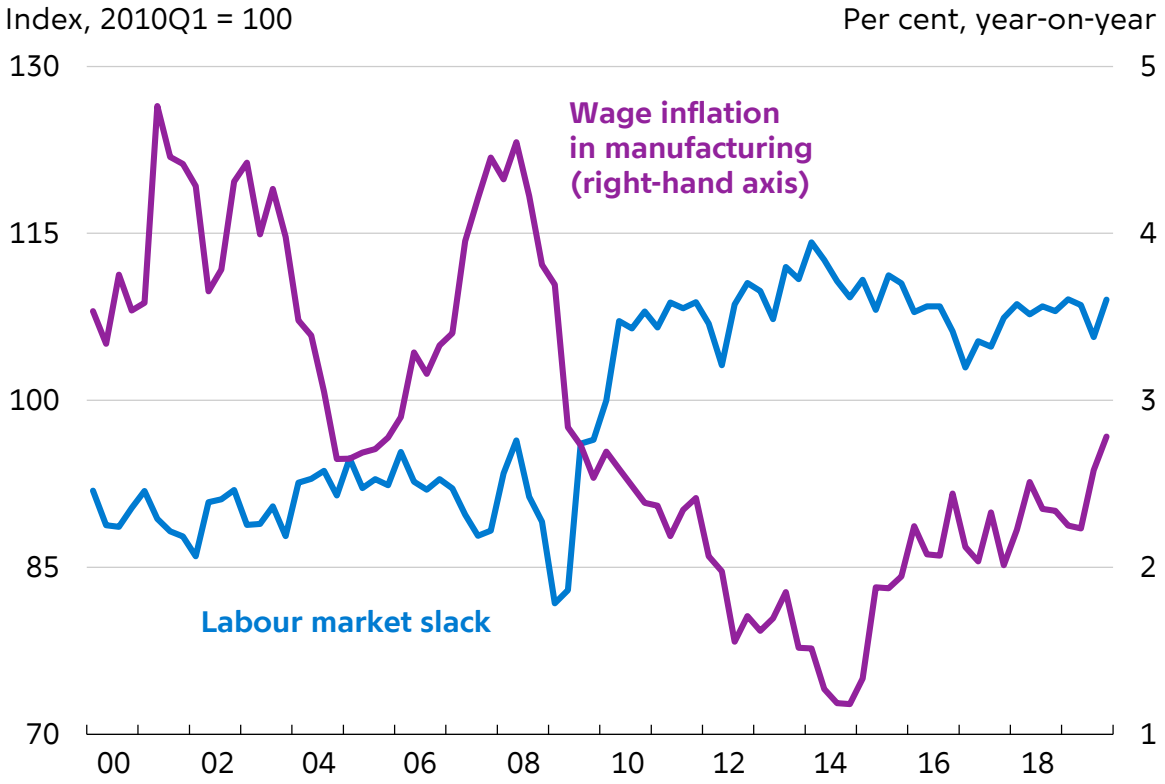
Can reduced wage competition among hiring firms explain the low inflationary pressures in Denmark?

The propensity of the employed to search for new jobs has declined



Note: Model concept for the quarterly share of Danish wage earners searching for new jobs based on Faccini and Melosi (2020).
Source: Own calculations based on register data from Statistics Denmark.

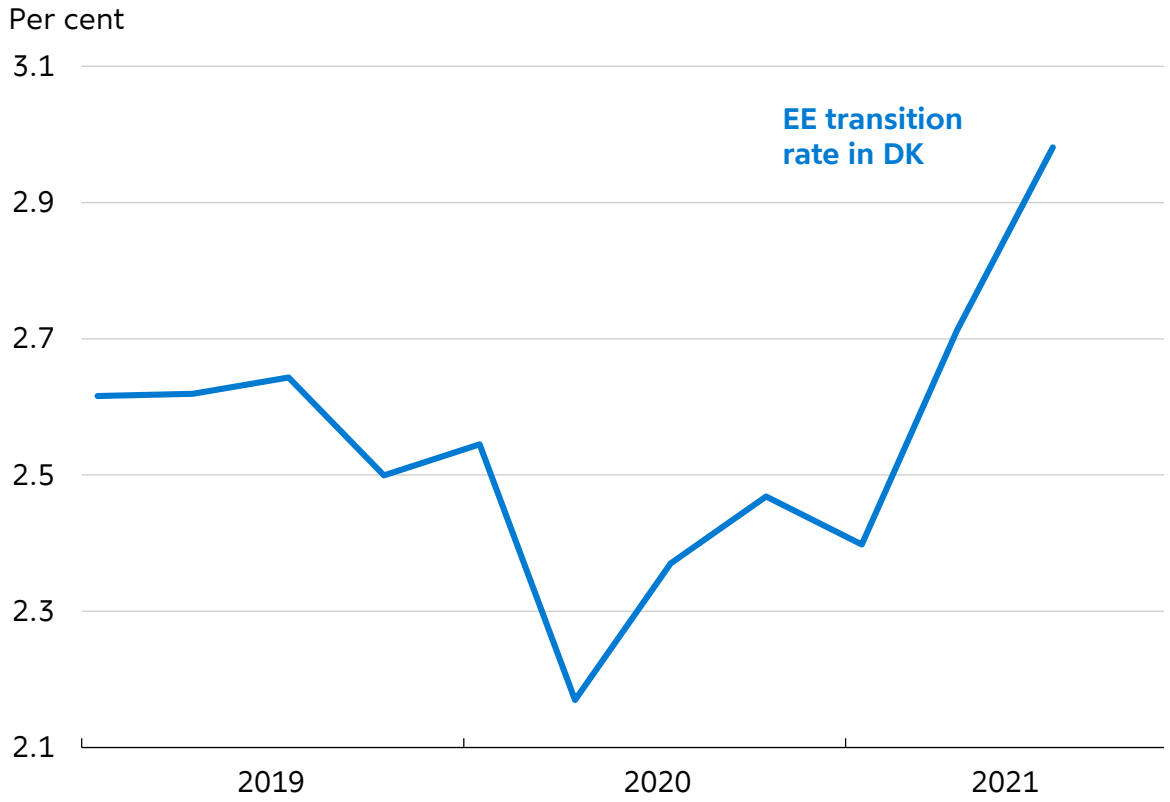
The generalised measure of labour market slack of Faccini and Melosi (2020) predicts subdued wage inflation in Denmark



Note: Measure of generalised labour market slack is based on Faccini and Melosi (2020) and can be thought of as the probability that wage negotiations with a prospective employee do not end with expensive agreements.
Source: Own calculations based on register data from Statistics Denmark.

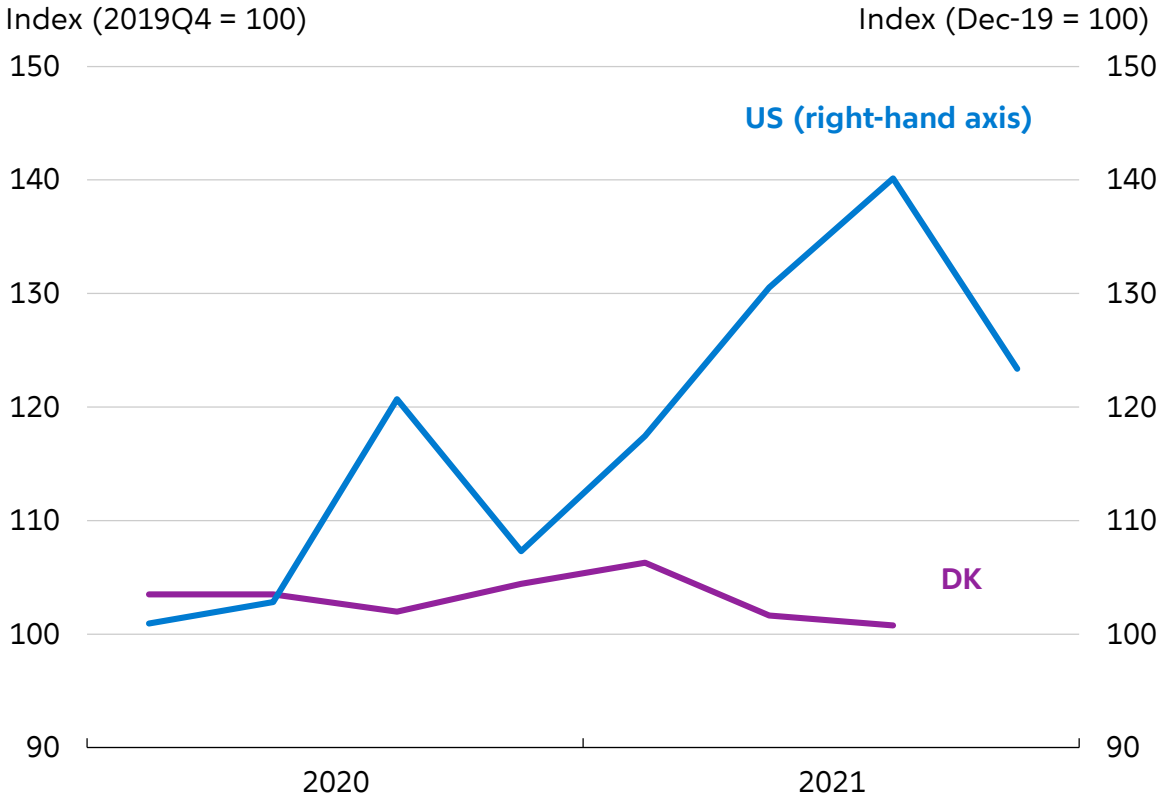
Will the same forces continue to constrain wage growth in Denmark?

Employment-to-employment transition rates have picked up over the past quarters in Denmark…



Note: Average monthly employment-to-employment transition rates per quarter in Denmark. Seasonally adjusted.
Source: Own calculations based on register data from Statistics Denmark.

… but the search propensity of the employed remains at pre-pandemic levels unlike in the US where it has been increasing



Note: Model concept for the quarterly share of wage earners searching for new jobs based on Faccini and Melosi (2020).
Source: Faccini et al. (2022) and own calculations based on register data from Statistics Denmark.