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The pressure on the labour market has eased after a job-intensive expansion

Employment has increased significantly in Denmark, the euro area and the US during the post-pandemic expansion, with stronger growth relative to GDP than in previous expansions. The high job intensity of the recent expansion in the Danish economy has several causes, including sectoral shifts, hiring of less productive labour and increased use of labour in production. This development has been supported by the fact that demand has risen sharply, supply has increased, and wages have risen more slowly than product and input prices during the period. However, the pressure on the Danish labour market has eased over the past two years.

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The post-pandemic expansion has been more job-intensive than previous expansions

Employment has increased sharply in Denmark, the euro area, and the US during the post-pandemic expansion, with stronger growth relative to GDP than in previous expansions. Employment has even continued to rise in Denmark and the euro area, even though growth in economic activity has been subdued in recent years.

Several factors have contributed to the job intensity of the expansion

The job intensity can partly be explained by sectoral shifts, but especially by more subdued productivity growth within industries. The subdued productivity growth covers, among other things, the hiring of less productive labour, labour hoarding and increased use of labour in production. This trend has been supported by the fact that hourly wages have risen more slowly than other prices in the economy after the pandemic.

The pressure on the labour market has eased

The factors behind the weak productivity growth in the Danish economy in recent years are expected to be less prominent going forward. From the perspective of companies, the relative price of labour is approaching pre-pandemic levels as wages rise. Together with the monetary policy tightening, this has helped to alleviate the pressure on the labour market.

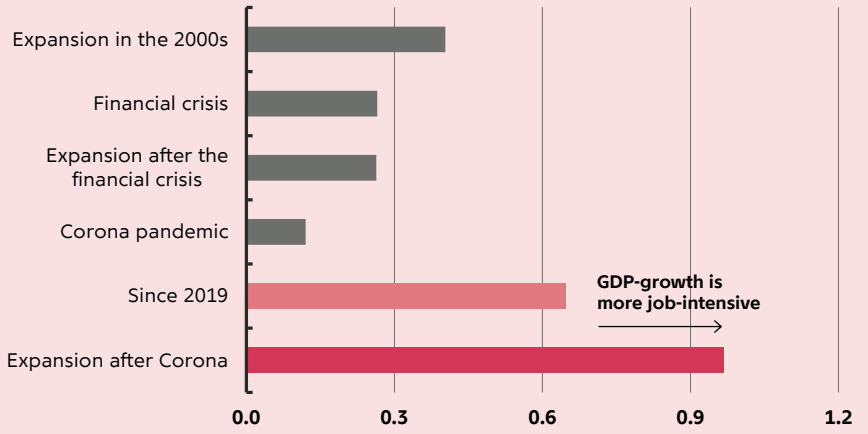
Why is it important?

The labour market is of vital importance to society and for economic development. Understanding movements in the labour market is therefore crucial for understanding the development of the Danish economy. This analysis contributes to Danmarks Nationalbank's ongoing assessment of the economy and helps lay the foundation for its recommendations for economic policy.

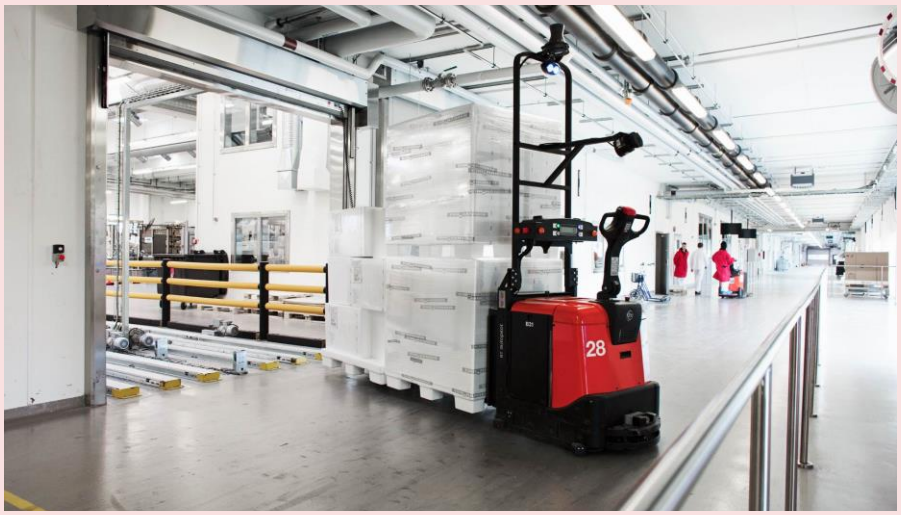
The labour market has so far remained resilient despite the slowing economy

— Christine Lagarde,
President of the ECB

Main chart: The expansion has been more job-intensive than previously



Note: The chart shows the relationship between employment growth and real GDP-growth. The periods are defined as: Expansion in the 2000s (2002Q3 – 2007Q4), Financial crisis (2007Q4 – 2009Q2), Expansion after the financial crisis (2009Q2 – 2019Q4), Corona pandemic (2019Q4 – 2021Q2), Since 2019 (2019Q4 – 2023Q4) and Expansion after Corona (2021Q2 – 2023Q4).
Source: Macrobond and own calculations based on the methodology in "The employment-GDP relationship since the crisis", *ECB Economic Bulletin*, issue 6, 2016.



Keywords

Labour market | Danish economy | Denmark and abroad | Economic activity

01
Introduction

During the post-pandemic economic expansion, employment has risen sharply in Denmark, the euro area, and the US, and has increased more in relation to GDP than in previous expansions. The expansion has thus been job-intensive and associated with more subdued development in productivity compared to previous expansions. This analysis will shed light on possible explanations for the high job intensity in Denmark during the post-pandemic expansion.

The high job intensity of the recent expansion in the Danish economy has several explanations. Firstly, shifts in employment towards less productive industries have contributed to the high job intensity. This is especially true for the private service industry, which should be seen in light of the shift in consumption towards services. Secondly, the development in productivity within individual industries has been more subdued since the pandemic. The subdued development in labour productivity within industries has several causes, but is overall the most significant factor behind the job-intensive expansion. This development has been supported in particular by the fact that the price of labour has been lower from the companies' perspective, both in relation to sales prices and other input prices.

A lower price of labour relative to other prices in the economy can contribute to weaker productivity growth in several ways. Firstly, the lower price of labour relative to sales prices, makes it more profitable for companies to hire people with weak attachment to the labour market, who on average appear to be less productive than the rest of the employed. Secondly, the lower price of labour relative to the price of other input factors means that it may have been advantageous for companies to substitute from other input factors towards increased use of labour in production. This substitution weakens hourly productivity because more employees have to share the same capital, for example, or if the need for highly skilled labour to operate the capital stock is reduced. Thus, the demand for labour shifts towards less productive occupations in line with observed trends since the pandemic. Thirdly, a lower relative price of labour can strengthen the argument for labour hoarding, whereby companies retain more employees than necessary for current production levels in the expectation that demand for their products will return quickly.

The factors behind the weak productivity growth in the Danish economy in recent years are not expected to fully remain going forward. As wages rise relative to other prices in the economy, the cost of labour increases from the perspective of companies. It thus becomes less profitable to hire people with a weak attachment to the labour market or to hoard labour, just as it becomes less advantageous to substitute from other input factors towards increased use of labour in production.

Through 2023, the pressure on the labour market has eased. Both the number of job postings per unemployed and labour shortages reported by companies have dropped. Meanwhile, job turnover has decreased, although the proportion of job changes among employed people remains at a higher level than before the pandemic. The easing pressure on the labour market should be seen in light of the monetary policy tightening that rising inflation has led to. Although the price of labour still appears to be relatively low from companies' perspective, relative prices in the Danish economy have approached pre-pandemic levels since mid-2022. This may also have helped to dampen the pressure on the Danish labour market.

02

The expansion has been more job-intensive than before

The post-pandemic expansion has been significantly more job-intensive than previous expansions in the Danish economy, see chart 1. Since mid-2021, employment has increased by just under 1 per cent for every 1 per cent increase in GDP.[1] This is significantly higher than during the expansion in the 2000s and after the financial crisis, when increases in GDP of 1 per cent were associated with increases in employment of 0.4 and 0.3 per cent, respectively. It is not an isolated Danish phenomenon that the post-pandemic expansion has been more job-intensive than previously. In both the euro area and the US, employment has also risen more sharply in relation to GDP than during previous expansions.[2]

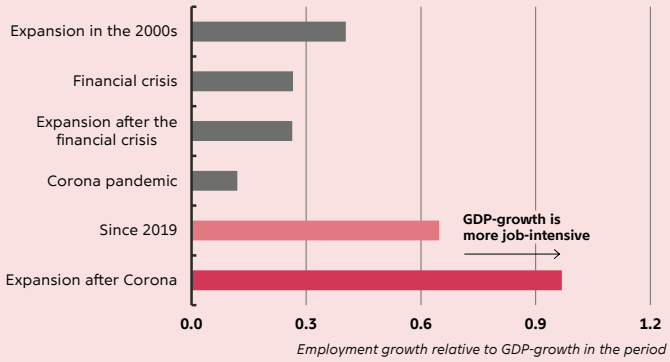
The counterpart to the relatively strong employment growth in relation to GDP growth is that growth in labour productivity – i.e., output per employed – has been significantly more subdued in the post-pandemic period than during previous expansions in the Danish economy, see chart 2. This trend masks significant differences across industries.[3] Especially in industries that employ relatively few people, unusual conditions in recent years have had a significant impact on real value added. On the one hand, Danish production abroad has increased significantly, which has contributed to strong productivity growth in the manufacturing industry.[4] On the other hand, productivity growth has slowed significantly due to the development in industries such as utilities as well as finance and insurance, which employ relatively few people. However, the overall picture remains one of relatively weak productivity growth in the Danish economy during the recent expansion when the contribution from these industries is taken into account.

[1] The assessment of the job intensity is influenced by special circumstances such as the lockdowns during the pandemic. However, if the entire pre-pandemic period is considered as a whole, the job intensity still appears to be remarkably high compared to previous expansions, albeit slightly lower than after the pandemic. For example, since the end of 2019, employment in Denmark has increased by just over 0.6 per cent for every 1 per cent increase in GDP.
[2] In the euro area, a 1 per cent increase in GDP has been associated with an increase in employment of just over 0.9 per cent since mid-2021 and just under 1.2 per cent since the end of 2019. In comparison, the post-financial crisis expansion was considerably less job-intensive, with employment increasing by just over 0.4 per cent for every 1 per cent increase in GDP. I the US, employment has increased by just under 1.2 per cent for every 1 per cent increase in GDP since mid-2021. This is significantly higher than during the post-financial crisis expansion, when employment increased by approximately 0.5 per cent for every 1 per cent increase in GDP. Since the end of 2019, the elasticity is significantly lower at 0.4 per cent as a result of what became known as the *Great Resignation*, which significantly reduced the US labour force.
[3] See also chapter 3.
[4] In recent years, merchanting and processing have played an increasing role in the assessment of the activity in the Danish economy in the national accounts. The terms cover the activity of Danish companies abroad and (wholesale) trade that do not cross Danish borders. However, foreign employment related to merchanting and processing activities is not included in the statistics of Danish employment.

CHART 1

The Danish economy's post-pandemic expansion is more job intensive than before

The relationship between real GDP growth and employment

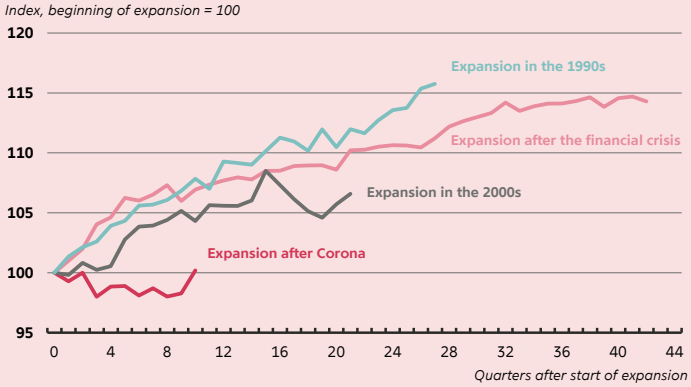


Note: The chart shows the relationship between employment growth and real GDP-growth over the period. The periods are defined as: Expansion in the 2000s (2002Q3 – 2007Q4), Financial crisis (2007Q4 – 2009Q2), Expansion after the financial crisis (2009Q2 – 2019Q4), Corona pandemic (2019Q4 – 2021Q2), Since 2019 (2019Q4 – 2023Q4) and Expansion after Corona (2021Q2 – 2023Q4).
Source: Macrobond and own calculations based on the methodology in "The employment-GDP relationship since the crisis", *ECB Economic Bulletin*, issue 6, 2016.

CHART 2

Productivity in the Danish economy has evolved less strongly after the pandemic compared to previous expansions

Development of real GDP per employed since the beginning of an expansion



Note: The chart shows the development in real GDP per person employed in different expansion periods. The dating of expansion periods is defined as: Expansion after Corona (2021Q2 – 2023Q4), Expansion after the financial crisis (2009Q2 – 2019Q4), Expansion in the 2000s (2002Q3 – 2007Q4) and Expansion in the 1990s (1993Q2 – 2000Q1).
Source: Statistics Denmark and own calculations.

The job intensity of the expansion should first and foremost be seen in light of the pandemic and the resulting crisis that preceded the expansion.[5] Firstly, unlike the period leading up to the financial crisis, there were no clear signs of imbalances or financial risks in the global economy and financial system before the pandemic. This meant that during the expansion, households and businesses did not have the same need for consolidation. Secondly, various lockdowns during the pandemic suppressed consumption – especially of certain services – which, together with the holiday payouts, led to significant savings among households. Thirdly, house prices rose significantly during the pandemic, increasing home equity. Together, these three factors contributed to a significant increase in economic activity immediately after the pandemic. Finally, the strong expansion has been underpinned by strong exports, partly due to fiscal and monetary easing in the US and the euro area during the pandemic.[6]

The labour market continues to show improvement despite subdued economic growth

The Danish labour market continues to show improvement, see chart 3. Since 2019, employment has increased by almost 213,000 people, and in the same period, unemployment has fallen by almost 23,000 people.[7] The continued improvement in the labour market is surprisingly strong, considering that the

[5] See Thomas Harr and Morten Spange, Inflation – why did it rise and what are the drivers ahead?, *Danmarks Nationalbank Economic memo*, no. 3, February 2023.
[6] Since then, a significant increase in the pharmaceutical industry has also contributed to export growth. See Danmarks Nationalbank, Persistently high inflationary pressures call for tight economic policy, *Danmarks Nationalbank Analysis (Outlook for the Danish economy),* no. 13, September 2023.
[7] Quarterly figures. However, since the start of 2022, unemployment has grown slightly from a low level.

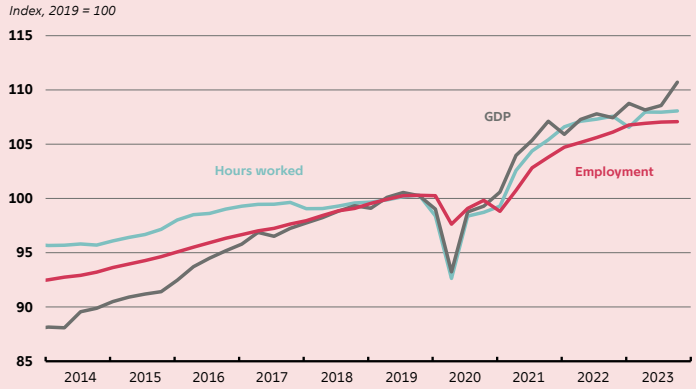
development in overall economic activity has been relatively subdued over the past two years.[8]

Employment has particularly increased in the private service industry, where just over half of the new jobs have been created, see chart 4. There has also been a large increase in the number of employed in the public administration, education, and health industry. The increase in employment in the service sector is related to the shift in consumption towards services after the pandemic.[9] The largest increase in employment also comes from an expansion of the labour force, while lower unemployment has only contributed with almost 23,000 people. The increase in the labour force is mainly driven by people aged 60-74 as well as foreign labour, see also chapter 4.

CHART 3

Both employment and hours worked have risen sharply in the wake of the pandemic

Development of real GDP, employment and hours worked in Denmark

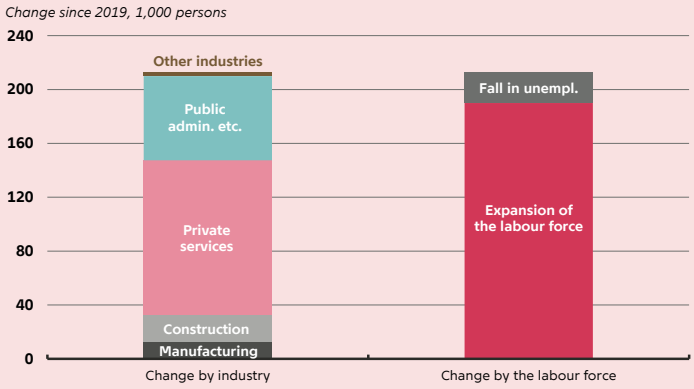


Note: The chart shows the development in real GDP, number of employed and hours worked in Denmark.
Source: Macrobond and own calculations.

CHART 4

Employment has increased, especially in the private service industry and through an expansion of the labour force

Change in the number of employed by industry and the labour force



Note: The chart shows the number of employed distributed across industries and contributions from a decrease in unemployment and an expansion of the labour force, respectively.
Source: Statistics Denmark and own calculations.

The recent development in the Danish labour market differs from those abroad in some respects. Firstly, employment in Denmark has increased more than in the euro area and the US. At the end of 2023, Danish employment was around 7 per cent higher than in 2019, while it was only just under 4 per cent higher in the US and the euro area. Secondly, the number of hours worked per employed has increased more in Denmark since 2019 than in the euro area and the US. The relatively higher increase in employment should possibly be seen in light of the Danish response to the pandemic, which focused on keeping the business community afloat. This gave some export companies the opportunity to take global market shares.[10]

[8] See Danmarks Nationalbank, Inflation is on track but some inflationary pressure persists, *Danmarks Nationalbank Analysis (Outlook for the Danish economy),* no. 2, March 2024.
[9] Total real household consumption (in Denmark) has increased by 4.0 per cent in the period from 2019 to Q3 2023. This covers a 5.3 per cent increase in the consumption of services and a 1.7 per cent increase in the consumption of goods. Up to Q4 2023, however, the consumption of goods has increased the most, but was particularly driven by an extraordinary increase in car sales, which should be seen in light of the increase in the registration tax for some electric cars on 1 January 2024.
[10] See Danmarks Nationalbank, Declining but still high inflation*, Danmarks Nationalbank Analysis (Outlook for the Danish economy)*, no. 4, March 2023.

The higher employment growth in Denmark than in the US and the euro area does not necessarily mean that the pressure on the labour market has been greater in Denmark. It could also mean that relatively more people in Denmark have supplied labour or worked more hours for the same wage. There may thus be differences in the driving forces behind the job-intensive expansions in Denmark and abroad.

The relationship between employment and GDP depends on the drivers

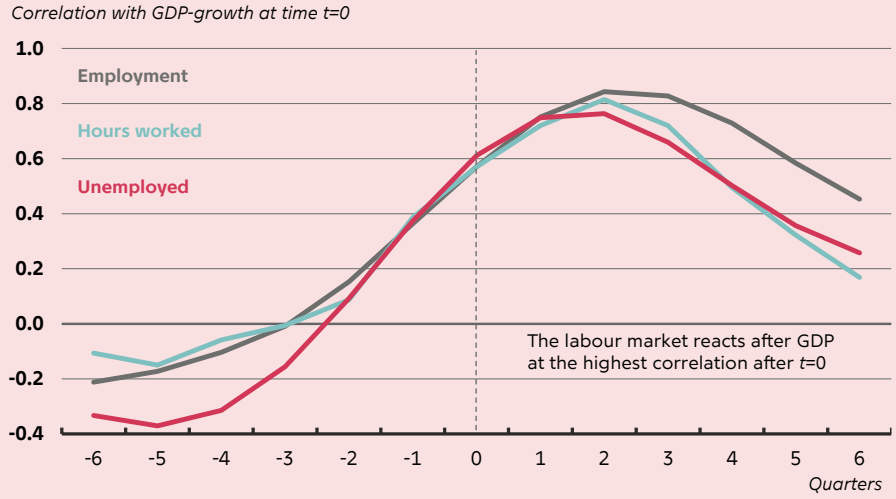
The labour market typically reacts with a few quarters of delay to changes in economic activity, see chart 5. This applies to both employment, unemployment and the number of hours worked. Thus, the subdued development in economic activity over the past two years indicates that a more subdued development in employment could be on the horizon, if the historical correlation is a good measure of the current context.

There may be several reasons why the subdued development in economic activity has not yet had an impact on the labour market. It is possible that the historical correlation between changes in GDP and employment is not representative for understanding the current labour market developments. The fact that the recent expansion has been significantly more job-intensive than previous expansions suggests that the drivers may have been different. Past expansions have unfolded on the back of real economic crises where demand has gradually increased. This differs from the post-pandemic expansion, where there was a lot of pent-up demand, which impacted economic activity immediately after the pandemic. Furthermore, during the recent expansion, employment increased while real wages were pushed down, which from the perspective of businesses appears to be a shock to the supply of labour. In this case, a larger movement in employment is to be expected relative to GDP compared to a more demand-driven expansion, as the fall in real wages in isolation has made it profitable for companies to hire more people, even if labour is less productive at the margin. In other words, the development in hourly productivity will be weaker in a more supply-driven expansion, consistent with the trend observed since the pandemic. Understanding the driving forces behind the job-intensive expansion on the supply and demand sides of the labour market is therefore relevant to understanding the future development of employment.

CHART 5

Labour market developments lag a few quarters behind in relation to GDP

Lead-lag correlations between GDP growth and growth in employment, hours worked and number of unemployed, respectively



Note: The chart shows lead-lag correlations between GDP growth year-on-year and year-on-year growth in employment, hours worked and the number of unemployed people between Q1 2001 and Q4 2019. The sign of the correlation with unemployment is reversed.
Source: Macrobond, OECD and own calculations.

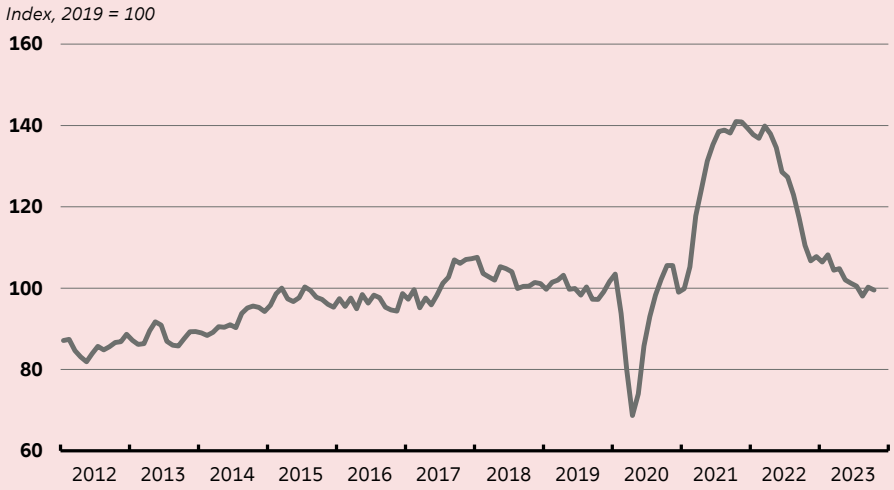
03
Higher demand for labour in less productive industries

Strong demand for labour has been a key driver behind the increase in employment, at least immediately after the pandemic. This is reflected in a sharp increase in the number of job postings in early 2021, see chart 6. With the reopening of the economy, overall economic activity increased significantly, partly due to a recovery of the consumption ratio after the lockdowns, but also due to relatively expansionary fiscal and monetary policies, especially in the US, but also in Europe.[11] The strong recovery has meant that many Danish companies wanted to increase their workforce at the same time. The strong demand for labour should thus be seen in light of the strong demand in the Danish economy during the period.

CHART 6

Index for the number of job postings has decreased over the past two years and is around pre-pandemic levels

Trend-adjusted index for the number of job postings



Note: The chart shows a chain index for the number of job postings. The index is chained at the company level, so that the increase in postings from month to month is based on the same group of companies in both months. See box 1.
Source: Jobindex and own calculations.

However, increased demand for labour seems less likely to explain the continued rise in employment after inflation peaked in mid-2022. The number of job postings has dropped significantly from a high level, indicating that the demand for labour has returned to roughly pre-pandemic levels. The indication is

[11] See Thomas Harr and Morten Spange, Inflation – why did it rise and what are the drivers ahead?, *Danmarks Nationalbank Economic Memo*, No. 3, February 2023.

supported by the fact that more Danish companies report a lack of demand as a constraint on production. This applies to all industries, but especially manufacturing.

BOX 1

New trend-correcting chain index for the number of job vacancies in Denmark

The development in the number of job postings is widely used as an indicator of labour demand. It is also one of the key factors in labour market search theory, where vacancies and unemployment are used to assess labour market pressures. However, it's not easy to quantify the total number of vacancies. For example, data from various online platforms does not cover the total labour needs of companies at a given time, as the number of job postings in a month represents on average about 20 per cent of the number of people who get a job in the same month. In addition, the use of online platforms has increased over the years. The increased use of online platforms raises concerns that there may be an underlying, unknown trend in the number of measured job postings, which could lead to a misleading perception of demand in the labour market.

The potential underlying trend in the number of measured job postings may be addressed by using the underlying job postings from Jobindex. This is done by adjusting the series for the addition of companies that have not previously used electronic job postings via Jobindex. Many job adverts include the CVR number of the company, and most other adverts mention the company in the text. By enriching the job postings with Danmarks Nationalbank's company database and data from the Danish Business Authority, it has therefore been possible to link around 85 per cent of job postings to companies for the years 2011-2023. Based on this, a chain index can be calculated, where the growth from month to month is calculated based on the same set of companies in both months. The selection criterion is that companies must have posted at least one job advert before the two months in question.

The downside of the chain index is that it doesn't give an indication of the actual number of job openings. This must be weighed against the fact that there is already a significant dark figure in the existing statistics on job postings due to the low number of job postings in relation to the number of people who get new jobs; that more than one employee may be sought in a single job posting; and that not all positions are filled. Therefore, the existing metrics are also not indicative of the level of job postings.

A lower relative price of labour has made it advantageous for companies to hire more people

Companies' demand for labour is dependent on several factors. Firstly, the company weighs the value created by an additional employee against the cost of labour. Secondly, demand depends on the price of labour relative to the price of other inputs in production, such as materials, energy, and capital.

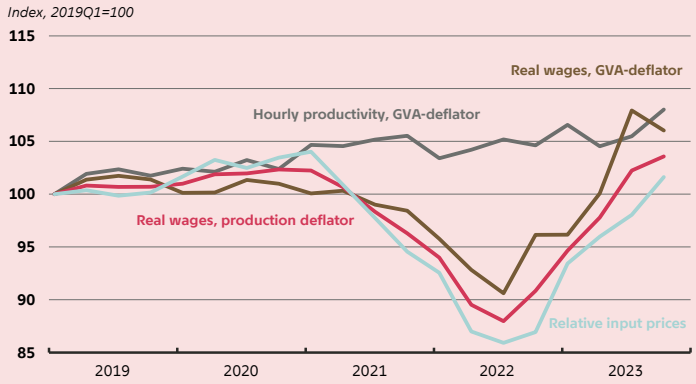
The strong demand for labour in the post-pandemic period may have been supported by the fact that the relative price of labour has been lower from the perspective of companies. At the beginning of 2021, hourly wages fell in relation to companies' product prices and in relation to, for example, the price of intermediate goods, while hourly productivity remained roughly unchanged, see chart 7. The price of labour thus became lower in relation to its value creation in companies and to other inputs in production.[12] For example, nominal wages have risen significantly less than the price of energy and capital in particular, but also less than the price of product imports, see chart 8. Overall, this means that it has been advantageous for companies to hire more people and to substitute away from other input factors towards increased use of labour in production.

[12] The fact that the price of labour has become relatively lower in relation to its value creation in companies assumes that higher product prices to some extent reflect the strong demand in the Danish economy after reopening. However, it is possible that the increased product prices also partly reflect price increases on other inputs in production, which are passed on to product prices. In this case, the drop in hourly wages in relation to product prices will have a less direct effect on employment because it is less profitable to employ more labour – for an unchanged hourly productivity. In practice, however, there is likely to be a certain stickiness in the adjustment of prices, which means that changes in marginal costs are not immediately fully passed on to product prices.

CHART 7

Labour became a more profitable input in companies' production after the pandemic

Developments in hourly productivity and relative labour prices

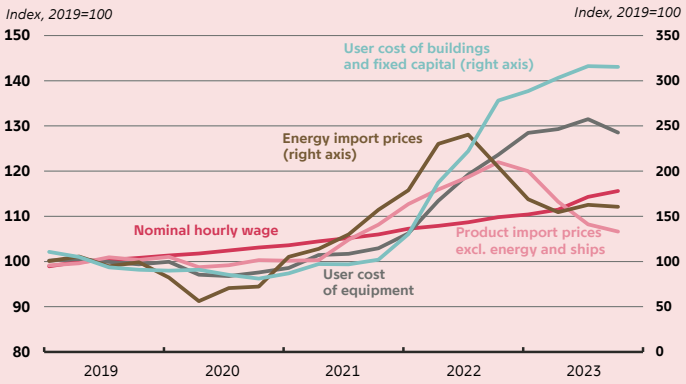


Note: The chart shows the development in GVA per hour and a number of indicators that may be relevant to Danish companies' demand for labour. Hourly wages are from the Confederation of Danish Employers' wage statistics for the manufacturing industry, while hourly productivity and price deflators are shown for the private non-primary sector. The relative input price is calculated as the ratio between the wage and the intermediate goods deflator.
Source: Statistics Denmark, Confederation of Danish Employers, and own calculations.

CHART 8

The price of labour has been relatively low compared to the price of other inputs

Developments in input prices of labour, energy, materials, and capital



Note: The chart shows developments in the price of relevant inputs for production. Hourly wages are from the Confederation of Danish Employers' wage statistics for the manufacturing industry.
Source: Statistics Denmark, Confederation of Danish Employers, MONA's data bank, and own calculations.

The decrease in the price of labour relative to the price of other input factors may also have contributed to the increased demand for labour relative to the level of production. Scenario calculations using the macroeconomic model ADAM indicate that substitution between input factors in production may have suppressed hourly productivity in the Danish economy by between 0.3 and 0.5 per cent during the post-pandemic expansion, see box 2. This masks an increase in employment and an almost unchanged level of production.

The shift towards increased use of labour in companies may have materialised in several ways. Firstly, companies may have scaled up their use of labour without correspondingly scaling up other input factors. For example, certain energy-saving measures may have been associated with an increased need for labour. Secondly, the increased use of labour may have been supported by increases in the user cost of capital. Since early 2022, inflation has led to a tightening of monetary policy, while long-term interest rates started rising earlier. Interest rate increases have made it relatively more expensive to invest in capital, and therefore also relatively more expensive to use and wear out the existing capital stock. It may thus have encouraged companies to also substitute capital with increased use of labour. However, this is contingent on supply being able to meet the increased demand, see also chapter 4.

BOX 2

Calculation using the macroeconomic model ADAM indicates that shifts in relative prices can dampen productivity in the Danish economy

Companies use various inputs to produce goods and services, including labour and capital in the form of machinery and buildings. To some extent, it is possible for them to achieve the same output by changing the mix of inputs used in production, e.g., by hiring more employees instead of investing in new machinery or vice versa, although in practice there can be some inertia associated with such a change. In particular, when there are fluctuations in relative prices, it is beneficial for companies to change the composition of inputs in production. After the pandemic, wages in the Danish economy have risen at a slower rate than the price of other inputs in production, which in principle may have increased the demand for labour at the expense of e.g., investments in the capital stock. If an increasing number of employees have to share a smaller capital stock, all else being equal, it will reduce labour productivity. Shifts in relative prices can thus contribute to dampening productivity growth or, correspondingly, give rise to a job-intensive expansion.

To get an indication of how much the shifts in relative prices between labour and other production inputs have suppressed hourly productivity in the Danish economy during the recent expansion, an illustrative calculation can be made using the macroeconomic model ADAM. The calculation assumes that the prices of labour, machinery, energy, intermediate goods purchases, and buildings across nine industries develop roughly in line with the observed course in the Danish economy in 2019-2023. For example, the price of labour falls on average by just under 6 per cent relative to companies' user costs for machinery, when the total economy is considered, see the notes to the table below for a detailed description of the shock.

The results indicate that shifts in the relative input prices of the same magnitude as seen in the Danish economy in 2019-2023 may have dampened hourly productivity by 0.3 per cent within a year, increasing to 0.5 per cent over time, see table. The lower productivity masks the fact that employment increases because of the lower relative price of labour, while e.g., the capital stock decreases, and output remains unchanged. Although the calculation is based on changes in the prices of five different inputs in production, the majority of the estimated effect comes from a shift away from machine capital and towards labour. In addition, when the estimated effect increases after the first year, it reflects that in the short run it is not possible for every company to fully adjust their production.

Overall, the illustrative calculation in this box suggests that a lower price of labour relative to other inputs in production may have suppressed hourly productivity and supported the job-intensive expansion of the Danish economy in the wake of the pandemic. Nevertheless, increased use of one production input such as labour cannot fully replace other production inputs for companies even in the long term.

TABLE

Macroeconomic effects of shocks to the relative prices of production inputs

	Effect after one year	Equilibrium effect
Employment	0.4 per cent	0.5 per cent
Machine capital	-0.4 per cent	-1.6 per cent
Gross value added	0.1 per cent	0.0 per cent
Hourly productivity	-0.3 per cent	-0.5 per cent

Note: The table shows estimated effects of a shock to the input prices in the macroeconomic model ADAM's factor block. The shock to the input prices is for every industry calibrated to correspond to their actual change in the period from 2019 to 2023 for each of the five production inputs: labour, energy, purchases of intermediate goods, machinery, and buildings. Specifically, labour costs for manufacturing, for example, are assumed to increase by approximately 9 per cent, while the price of energy purchases increases by approximately 112 per cent, and the price of intermediate goods purchases by approximately 11 per cent. In addition, user costs for machinery and buildings are assumed to increase by approximately 21 and 109 per cent, respectively, mainly due to higher interest rates. The equilibrium effect refers to a situation where the economy is fully adjusted to the changed prices. The calculation is based on ADAM's factor block and not the entire ADAM model. This means that the estimated effects do not take into account possible sectoral shifts in production resulting from the fact that the relative output prices of industries change, when the relative input prices change.

Source: Own calculations on the macroeconomic model ADAM's factor block, see Statistics Denmark, Adam – en model af dansk økonomi, chapter 6, 2012 (in Danish).

The fact that companies should have substituted between inputs in production after the pandemic is supported by a new European study, which indicates that companies on average increase their headcount when production is limited by the access to materials and/or equipment.[13] However, substitution is also seen in the fact that the demand for labour has shifted towards low-paid skills.[14] The rationale is that companies' need for highly skilled labour to operate their capital stock is reduced when substituting for increased use of labour in production.[15]

However, the substitution towards increased use of labour need not have materialised within the individual company. It may also have materialised through competition between companies that produce the same thing but have different production functions. When wages rise less than the price of other input factors, a labour-intensive company will be able to provide its goods/services more cheaply than an energy- or capital-intensive company, thus shifting production towards the labour-intensive part of the economy.

The improvement in the labour market has especially occurred in industries with low hourly productivity

The job intensity of an expansion does not solely depend on the development of productivity within industries. It also depends on the evolution of the relative size of industries given their different productivity levels. A decomposition indicates that sectoral shifts have on average suppressed productivity growth in the Danish economy by 0.1 percentage points annually from 2020 to 2023, see chart 9.[16] When an increasing proportion of hours worked comes from industries such as business services, where gross value added (GVA) per hour is relatively low, it contributes to weaker aggregate productivity growth.[17] Similarly, the decline in e.g., manufacturing has in isolation dampened growth in hourly productivity, as GVA per hour is relatively high in that industry. However, over the past 10 years, a negative contribution to hourly productivity from sectoral shifts seems to have been the rule rather than the exception.[18]

Sectoral shifts have also contributed to weak labour productivity growth in the euro area and the US in recent years, but the contribution has been greater in Denmark.[19] The sectoral shifts in a market economy reflect an appropriate adjustment in the allocation of the economy's resources, which – due to the low average capital intensity of private services – has led to lower aggregate labour productivity.

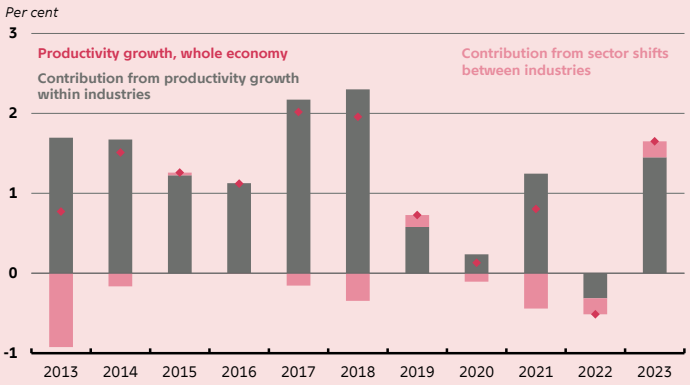
[13] See Bernardus Doornik, Deniz Igan and Enisse Kharroubi, Labour markets: what explains the resilience?, *BIS Quarterly Review*, December 2023.
[14] This is shown later in the analysis based on chart 11.
[15] Dolado et al. show that an accommodative monetary policy shock increases the relative employment of higher-skilled labour compared to lower-skilled labour. The authors then argue that capital and high-skilled labour are complements, while capital and low-skilled labour are substitutes. See Juan J. Dolado, Gergo Motyovszki and Evi Pappa, Monetary Policy and Inequality under Labor Market Frictions and Capital-Skill Complementary, *American Economic Journal*, vol. 13(2), pp. 292-332, 2021.
[16] The contribution from changes within industries describes the part of productivity growth that stems from the individual productivity growth of those industries, assuming no change in the sector weights (proportion of hours worked). The contribution from sectoral shifts, on the other hand, describes the impact of changes in industry weights on overall productivity growth when productivity for each industry is kept constant. For a more detailed description, see for example Jianmin Tang and Weimin Wang, Sources of aggregate labour productivity growth in Canada and the United States, *The Canadian Journal of Economics*, vol. 37(2), 2014, ECB, Key Factors behind productivity trends in EU countries, *ECB Occasional Paper*, box 3, 2021, and European Commission, *The European Economy*, no. 6, chapter 2 and annex 3, 2003.
[17] The business service industry includes lawyers, accountancy, business consultants, advertising agencies, veterinarians, travel agencies and cleaning services.
[18] It should be noted that the calculated contribution from sectoral shifts may be underestimated if there are also shifts between industries defined at a more detailed level. In addition, a sectoral shift can both occur due to a change in the distribution of the proportion of hours worked between industries, and due to new relative prices when using chained indices for GVA. If a highly productive industry experiences a relative price deterioration, it can lead to lower aggregate productivity growth, as it subsequently carries less weight in the economy's overall production.
[19] See Bernardus Doornik, Deniz Igan and Enisse Kharroubi, Labour markets: what explains the resilience?, *BIS Quarterly Review*, December 2023.

However, sectoral shifts can only partly explain the subdued development in hourly productivity in the Danish economy in recent years. Within the industries, the growth in hourly productivity has also decreased. Between 2020 and 2023, changes within the industries have on average boosted productivity growth in Denmark by 0.7 percentage points annually, which should be compared to an average contribution of 1.5 percentage points annually between 2013 and 2019. This development masks large differences in productivity growth across industries, see chart 10. While there has been a significant increase in GVA per hour in manufacturing from 2021 to 2023, the decline in GVA per hour in utilities as well as finance and insurance have, in isolation, contributed to significantly weaker productivity growth in the Danish economy during this period. There has also been a negative contribution from public administration, education, and health since 2020, as well as a weaker hourly productivity growth in trade and transport compared to before the pandemic.

CHART 9

Sectoral shifts between industries have suppressed productivity growth in the Danish economy since the pandemic

Decomposition of growth in GVA per hour into contributions from sectoral shifts and productivity growth within industries

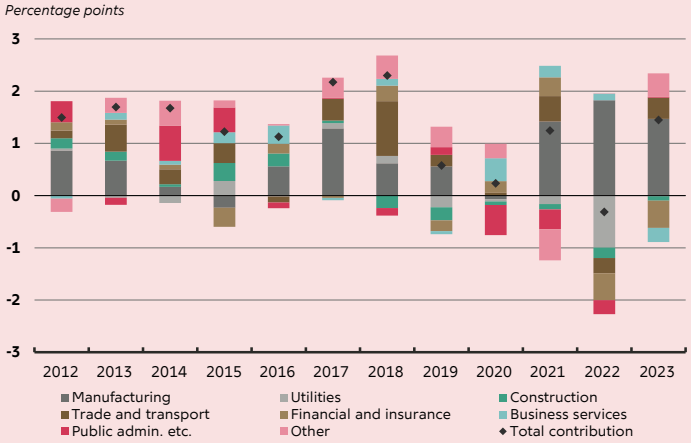


Note: The chart shows a shift-share decomposition of productivity growth measured by GVA per hour based on the method in Rasmus Mose Jensen and Casper Winther Nguyen Jørgensen, Dansk produktivitet under opsvinget, *Danmarks Nationalbank Monetary Review*, 2nd Quarter 2016 (in Danish). Ten industries are used to calculate the contribution from sectoral shifts. For an introduction to shift-share decomposition, see also box 3 in ECB, Key factors behind productivity trends in EU countries, *ECB Occasional Paper*, 2021.
Source: Statistics Denmark and own calculations.

CHART 10

Productivity growth within industries is fuelled by manufacturing, but suppressed by a number of other industries

Decomposition of contributions to growth in GVA per hour from changes in hourly productivity within industries



Note: The chart shows the decomposed contribution to productivity growth in Denmark from changes in hourly productivity within industries. This is a shift-share decomposition of productivity growth measured by GVA per hour based on the method in Rasmus Mose Jensen and Casper Winther Nguyen Jørgensen, Dansk produktivitet under opsvinget, *Danmarks Nationalbank Monetary Review*, 2nd Quarter 2016 (in Danish). Ten industries are used to calculate the contribution from sectoral shifts. For an introduction to shift-share decomposition, see also box 3 in ECB, Key factors behind productivity trends in EU countries, *ECB Occasional Paper*, 2021.
Source: Statistics Denmark and own calculations.

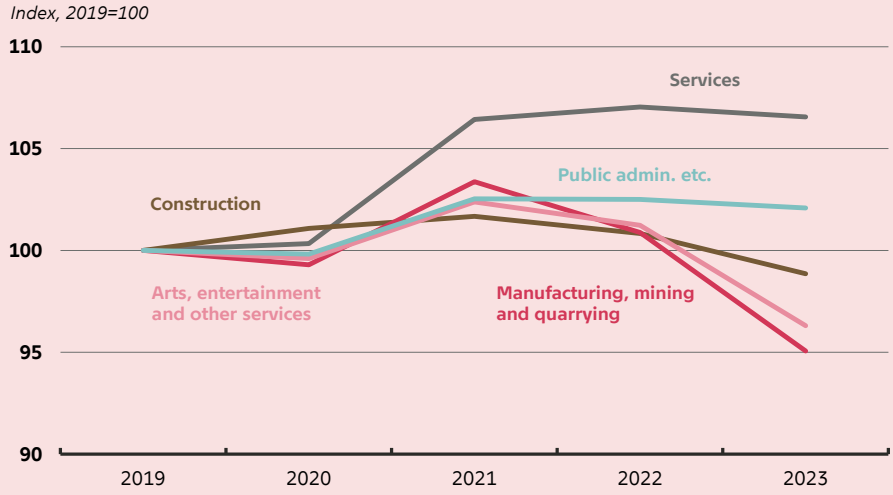
The overall productivity growth within the industries has been affected by many unusual circumstances following the pandemic, particularly in parts of the economy that employ relatively few people. Firstly, Danish production abroad has increased significantly, which has contributed to strong productivity growth in the manufacturing industry because much of the labour associated with production abroad is not calculated in the number of hours worked in Denmark. In isolation, this means that hourly productivity in the overall economy is

overestimated. Secondly, during this period, there were significant price increases in the utilities industry, which only accounts for around one per cent of hours worked in Denmark. This has contributed to significantly weaker productivity growth in the Danish economy, especially in 2022. Thirdly, there has also been a significant decline in finance and insurance, partly due to rising interest rates, affecting the deflation of the industry's activities and thus the industry's real value added. This industry also employs a relatively small proportion of the labour force in Denmark. Fourthly, hourly productivity in trade and transport has been held down by rising sea freight prices in the post-pandemic period, and thus changing market conditions have also affected hourly productivity in the Danish economy during this period. Finally, there is a significant negative contribution to hourly productivity during and after the pandemic from public administration, etc., where productivity is notoriously difficult to calculate. In other words, there are several temporary industry-specific factors that affect the measured hourly productivity in the Danish economy, but which do not necessarily reflect a decline in productivity for the typical hour worked in the Danish economy.

CHART 11

The demand for low-paid skills especially increased in the service sector immediately after the pandemic

The proportion of job postings within industries that demand skills associated with relatively low-paid occupations



Note: The chart shows the development in the proportion of job postings across industries that demand relatively low-paid skills, based on the methodology of the upcoming Working Paper with the provisional title *What skills are employers looking for? Evidence from Jobindex.dk* from Danmarks Nationalbank. First, for each job advert, the skills demanded are identified using a large language model, GPT-3.5. Next, the returned skills from the language model are converted to the pan-European ESCO classification using a semantic language model. Finally, relatively low-paid skills are identified by linking the individual skills to occupations, and then linking these occupations to standard calculated wage indices from Statistics Denmark. Specifically, relatively low-paid skills are defined as skills associated with occupations with wage indices that are, on average, below the median wage in 2016.
Source: Jobindex, Jobnet, Statistics Denmark and own calculations.

It also appears that shifts in the skills in demand within the industries may have contributed to weaker productivity growth in the Danish economy. In 2021 and 2022 there was a general increase in the share of job postings demanding skills

associated with relatively low-paid occupations, see chart 11. This is especially true for the service industry, where the share also seems to have increased more than its pre-pandemic trend would suggest. As the pay for this type of labour is relatively low compared to labour with higher-paid skills, it is also likely to be less productive on average. Shifts in the demand for skills may therefore also have contributed to the high job intensity of the recent expansion.

Labour hoarding indicators rose in the wake of the pandemic, but have since declined

When there are shifts in economic activity, it is typically seen that the labour market adjusts with a lag relative to GDP. This can, among other things, be due to labour market frictions, i.e., the costs associated with hiring and firing employees. Such frictions can lead to labour hoarding, where firms retain more labour at the beginning of a downturn than necessary relative to the actual production level because there are costs associated with firing and rehiring that must be weighed against the expected duration and depth of the downturn. However, hoarding can also occur in situations where there is a shortage of (skilled) labour, where companies, as a precautionary measure, maintain employment above what is necessary for the current production. Since the pandemic, there has been significant pressure on labour markets in Denmark, the euro area and the US. This has likely increased recruitment costs for companies and thus contributed to labour hoarding in some companies.

The extent of labour hoarding cannot be calculated directly, although business tendency surveys can give an indication of the development of hoarding.[20] By comparing companies' expectations for their production and number of employees in the short term, the development in the extent of labour hoarding can be illustrated by the proportion of Danish companies that expect falling production and an increasing or unchanged number of employees over the next three months.[21] The indicator increased significantly both during and after the pandemic, but has dropped significantly in the last year, see chart 12. It shows that, on average, around five per cent of Danish companies expected to retain or hire more employees each month in the second half of 2023, despite the prospect of declining production. This is slightly higher than before the pandemic, but in line with the average since 2011. The same picture emerges across industries, see chart 13.

In the euro area, there are also indications of relatively high labour hoarding among companies in the immediate post-pandemic period.[22] As in Denmark, however, the labour hoarding indicator has decreased since the end of 2022.[23] There are therefore indications that labour hoarding may have contributed to weak productivity growth in Denmark and the euro area in the immediate post-pandemic period, but this does not seem to explain recent developments in the labour markets.

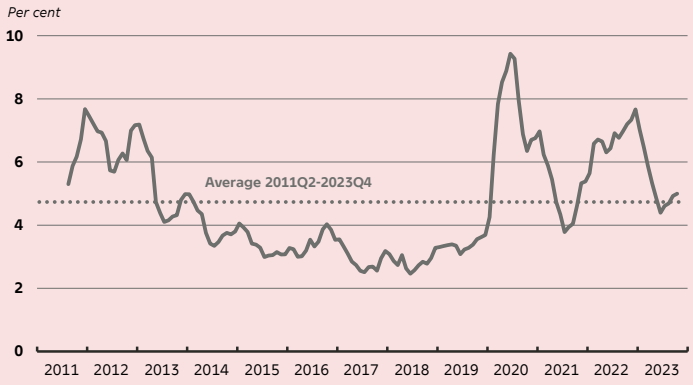
The extent of hoarding in Denmark is generally at a lower level than in the euro area. This can probably be explained by the more flexible Danish labour market, where the costs of adjusting the use of labour in companies are relatively low.

[20] See European Commission, European Business Cycle Indicators – A new survey-based labour hoarding indicator – 2nd Quarter 2023, *European Commission Technical Paper*, 066, July 2023.
[21] The indicator does not measure the level of labour hoarding. For example, a company may have more employees in a given month than necessary in relation to production levels, but if both employment and production are expected to remain unchanged in the coming period, it will not be captured by the indicator. Conversely, the indicator may also overestimate the extent of labour hoarding if a company has already adjusted employment to a lower expected production level for the coming months. In this case, the company will expect unchanged employment but declining production, even though there are actually fewer employees than the current production level requires.
[22] The business surveys used to assess the development of hoarding are based on standardised questionnaires distributed to companies in all EU countries.
[23] See European Commission, European Business Cycle Indicators – A new survey-based labour hoarding indicator – 2nd Quarter 2023, *European Commission Technical Paper*, 066, July 2023.

CHART 12

The proportion of Danish companies that show signs of labour hoarding has decreased...

The proportion of Danish companies that expect declining production and an unchanged or increasing number of employees

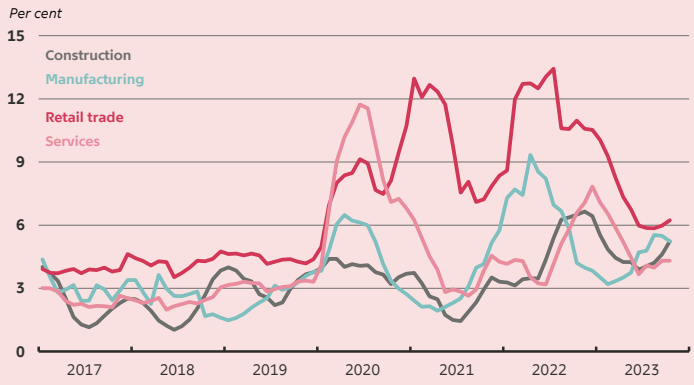


Note: The chart shows a weighted average of the sector-specific labour hoarding indicators. The weights for each sector reflect its proportion of total wage earner employment in the four sectors of Construction, Manufacturing, Services and Retail Trade. The indicator thus measures the average proportion of Danish companies that report that they expect production to decrease but the number of employees to remain unchanged or increase over the next three months. The series is displayed as a six-month centred moving average.
Source: Statistics Denmark and own calculations.

CHART 13

...after a period of significant increases across industries in the wake of the pandemic

The proportion of Danish companies that expect declining production and an unchanged or increasing number of employees



Note: The chart shows the proportion of Danish companies across sectors that report that they expect a decline in production but an unchanged or increasing number of employees over the next three months. The series are shown as six-month centred moving averages.
Source: Statistics Denmark and own calculations.

04
Labour supply has contributed to the job-intensive expansion

Increased labour supply has also contributed to the increase in employment during the post-pandemic expansion. This is reflected in the fact that the increase in employment has primarily occurred through an expansion of the total labour force and only to a lesser extent through movements from unemployment into employment, see chart 14. One important reason for this is that several major labour market reforms have increased the structural labour force in Denmark significantly during this period. Furthermore, labour supply has been supported by the influx of foreign labour in recent years and by the increased incentive for individuals on benefits to enter employment, as their purchasing power has fallen more than real wages. To the extent that the influx of labour may not be as productive as the already employed part of the population, it may have reduced average productivity. Thereby, the supply of labour may have contributed to the job-intensive nature of the post-pandemic expansion.

In the euro area, the labour force has also increased after the pandemic, but to a lesser extent than in Denmark. Similar to Denmark, the development has particularly been supported by the oldest in the labour market and by immigrants.[24] This is in contrast to the development in the US, where the labour force has returned to approximately pre-pandemic levels after experiencing a significant decline.

Foreign labour and older workers have contributed the most to employment growth

Foreign labour has accounted for more than 40 per cent of the increase in payroll employment since 2019. This is partly because a significant proportion – around 40 per cent – of gross immigration has come to the country with the primary purpose of working, and partly because the employment rate among resident foreigners has increased significantly, see chart 15. Many women with foreign backgrounds in particular have entered the labour market in the years following the pandemic.[25] Similarly, many Ukrainian refugees have found employment.[26] At the same time, newly arrived foreign nationals seem to become part of the Danish labour force and population for a number of years.[27] This indicates that they are to some extent a more permanent labour force, although previous analyses suggest that some of the influx should be seen as cyclical.[28] On average, it is assessed that foreign labour is slightly less productive

[24] See Vasco Botelho and Clémence Berson, Record labour participation: workforce gets older, better educated and more female, ECB blog, 2023.
[25] See Statistics Denmark, *Indvandrere i Danmark 2023*, December 2023 (in Danish).
[26] See Ministry of Economic Affairs, *Økonomisk Redegørelse*, chapter 5, December 2023 (in Danish).
[27] See e.g., Pernille Valentin Borgensgaard, Labour scarcity in Denmark: what role do foreign recruitments play?, *Danmarks Nationalbank Economic Memo*, no. 12, October 2022, and Danish Economic Council, Danish Economy, Autumn 2023, chapter II.3, *Konjunktur og offentlige finanser – Aktuelle udsigter for dansk økonomi*, 2023 (in Danish).
[28] See e.g., Jakob Feveile Adolfsen and Rasmus Mose Jensen, Intra-EU labour mobility dampens cyclical pressures, *Danmarks Nationalbank Analysis*, no. 1, January 2019, and Hans Jørgen Whitta-Jacobsen, Niels Storm Knigge and Frederik Nørrind Lando, Kraka-Deloitte "Small Great Nation", p. 8, November 2018.

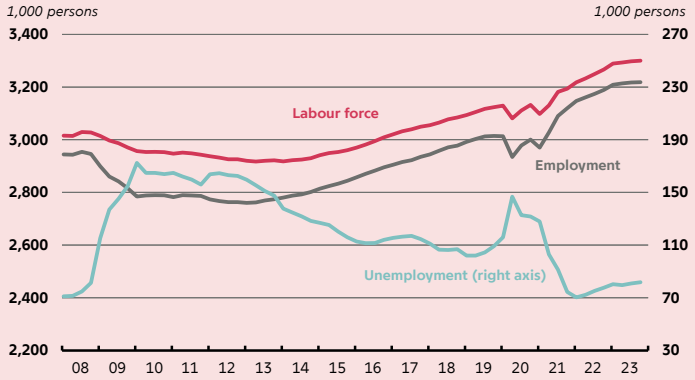
than the average of the rest of the employed, and thus the influx of foreign labour may have contributed to the expansion being more job-intensive.[29]

The labour supply has also increased significantly as employment among the oldest part of the population has grown. The 60- to 74-year-olds have accounted for around 28 per cent of the total increase in employment since 2019, and the employment rate for the group has grown by 7 percentage points during the period. In comparison, the employment rate for the 25- to 39-year-olds and the 40- to 59-year-olds has increased by 2 and 1 percentage points, respectively, since 2019. The development in the labour supply among the 60- to 74-year-olds is supported by several major labour market reforms in recent decades, aimed at expanding the labour force by retaining older people in the labour market. This especially includes the raising of the early and statutory retirement ages. However, it is not readily apparent whether people close to the retirement age are more or less productive than other employed. On the one hand, there are many years of experience among this group, but on the other, physically demanding jobs over a working life can reduce the potential for some.

CHART 14

The increase in employment has primarily occurred through an expansion of the labour force

Development in the labour force, employment, and unemployment in Denmark

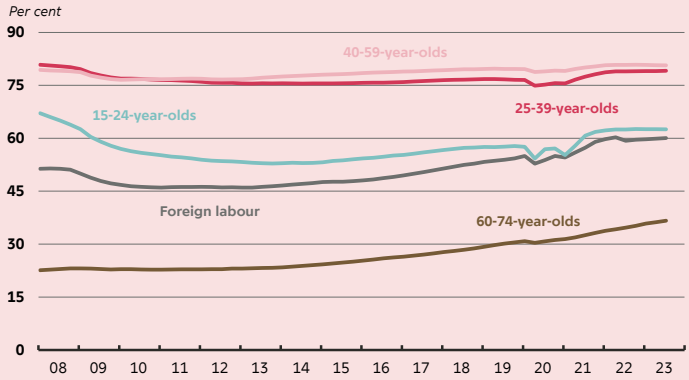


Note: The chart shows the development in the labour force, employment, and unemployment in persons. Seasonally adjusted.
Source: Statistics Denmark.

CHART 15

The employment rate has increased, especially for foreigners and older people

Employment rates across population groups



Note: The chart shows employment rates for different population groups in Denmark in the 15-74 age group. *Foreign labour* includes people who were born abroad, and whose parents have non-Danish citizenship or were born abroad. Seasonally adjusted.
Source: Statistics Denmark, Jobindsats and own calculations.

More people with weak labour market attachment have found employment

In addition to a large proportion of older workers and foreign labour, part of the increase in total employment has come from a decrease in unemployment. After a marked decline in 2021, unemployment has only risen slightly from the start of 2022, and it may be considered whether there is a significant gap to pure frictional unemployment, i.e., unemployment related to job changes, as the number of long-term unemployed has decreased by roughly 10,000 people since 2019 to about 15,000 people.

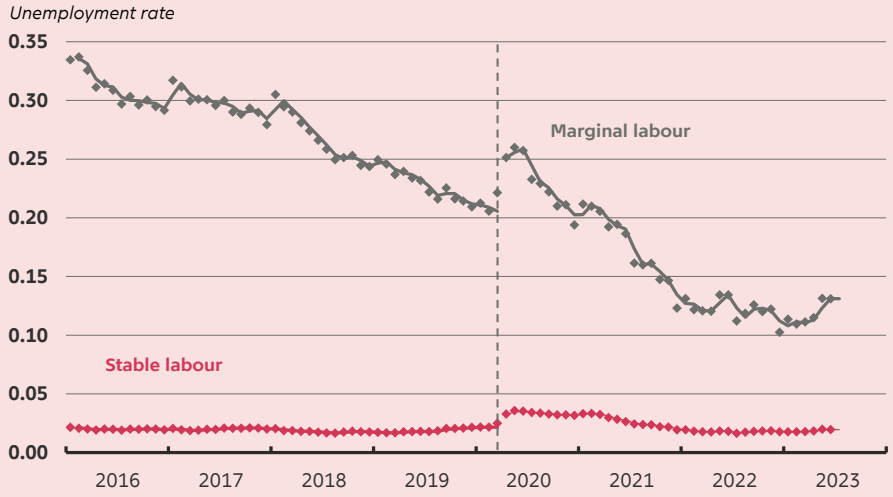
[29] See Niels Storm Knigge and Frederik Nørrind Lando, *Udenlandsk arbejdskraft er meget værdifuldt for Danmark*, Kraka Analyse, October 2018 (in Danish).

Particularly, the unemployment rate has fallen for people who generally have a fluctuating attachment to the labour market after the pandemic, see chart 16. This group is referred to as 'marginal labour' in the analysis. It covers around 15 per cent of the labour force and is characterised by higher levels of unemployment and unstable employment. Marginal labour is estimated to have accounted for approximately the entire decline in unemployment since 2019. The development has been supported by the high demand for labour immediately after the pandemic, which made it difficult to fill vacancies. At the same time, it has been profitable for companies to hire less productive labour, since the price of labour has fallen relative to firms' sales prices, see chapter 3.

CHART 16

The unemployment rate for people with weaker labour market attachment has fallen significantly

The development in the unemployment rate for marginal and stable labour



Note: Average unemployment rate by stable and marginal labour as defined in Saman Darougheh, The role of marginal workers in Danish unemployment, *Danmarks Nationalbank Economic Memo*, no. 7, October 2023. Unemployed are defined as people who receive unemployment benefits and no labour income. The vertical line in March 2023 divides the period into before and after the corona pandemic.
Source: Register data from Statistics Denmark and own calculations.

There is evidence to suggest that the group of marginally employed are less productive compared to those with a more stable attachment to the labour market.[30] For example, average wages are lower and there may be higher training costs associated with marginal labour. Assuming that marginal labour is on average half as productive as other types of employment, and that the entire decline in unemployment is due to marginal labour entering employment, then it can explain about half a percentage point drop in hourly productivity over the period – particularly concentrated in 2021.

The currently very low unemployment rate among marginal workers could indicate that employment immediately after the pandemic has increased their

[30] See Saman Darougheh, The role of marginal workers in Danish unemployment, *Danmarks Nationalbank Economic Memo*, no. 7, October 2023.

attachment to the labour market. As such, it can be presumed that they will make up a more stable and productive labour force in the future.

More people have found employment despite a fall in real wages

From mid-2021, real wages – i.e., private sector wages relative to consumer prices – in Denmark have fallen significantly, see chart 17. In combination with rising employment during the period, this development is typically associated with a supply shock, meaning that more people have wanted to supply labour on the Danish labour market or work more hours for the same or lower wages.

The development has been supported by the fact that, in the period after the pandemic, it has become more favourable for people on benefits to enter employment. In general, people on benefits have seen their purchasing power deteriorate more compared to that of the employed, as real benefits have fallen more than real wages, see chart 17.[31] This is because the rate adjustment for public benefits takes place with a delay of around two years compared to private wage increases. The larger decrease in real benefits may have increased the labour supply for people outside the labour force. For example, it is relatively easy for students to enter part-time employment when there is demand for their labour. Similarly, older people are inclined to adjust their participation in the labour market relatively much when the income from working changes in relation to the consumption opportunities generated by employment.[32]

The fact that the decline in real wages has not led to a decrease in employment among the broader population should first and foremost be understood in the context of nominal wages adjusting slowly to changes in overall economic activity. Stickiness in wage adjustments can occur because the framework for wage growth is agreed upon for a multi-year period – typically two to three years – during central wage negotiations. It means that when inflation picked up in late 2021, a three-year agreement on central wage increases of two per cent annually for the private labour market had already been reached in the previous year.[33] There may be some degree of wage drift, i.e., wage increases beyond those agreed, but typically the actual wage development in Denmark largely follows that of the agreed wage increases, see box 3.

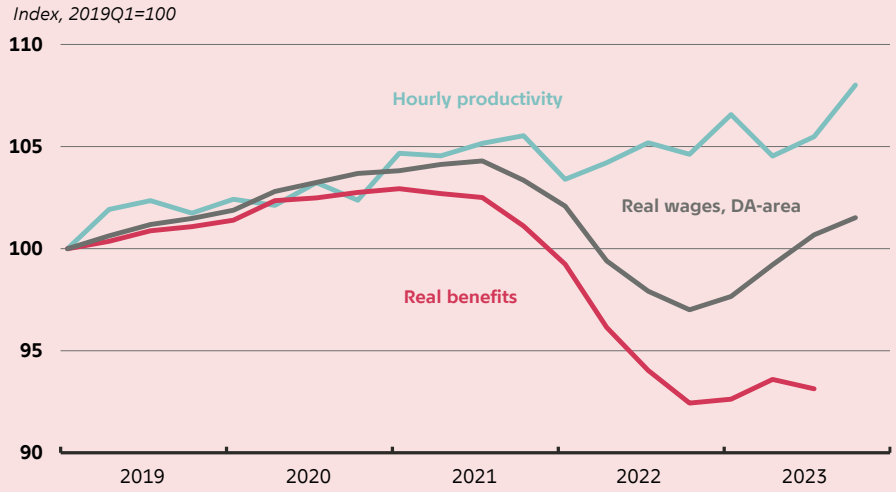
The structure of the labour market therefore contributes to a significant degree of nominal rigidity in wage patterns. The current real wage is therefore not necessarily an expression of a wage that would ensure equilibrium in the labour market in the medium term. As there are costs to the individual associated with finding and starting a new job, the fall in real wages will not necessarily lead to resignations among people who, in isolation, do not want to work at the current real wage. For example, this may be in the expectation that the fall in real wages is temporary due to the timing of central wage negotiations. The personal cost of the fall in real wages must therefore be weighed against the transitional cost associated with leaving and entering employment. This trade-off can help explain why there has not been an outright decline in employment among the broader population.

[31] However, it should be noted that the calculation does not include temporary measures such as inflation relief.
[32] See e.g., Eric French and John Bailey Jones, Public pensions and labor supply over the life cycle, *International Tax and Public Finance*, 19(2), pp. 268–287, 2012.
[33] Including the free-choice scheme, annual salary increases of around 3 per cent were agreed.

CHART 17

Since mid-2021, the purchasing power of persons in employment has fallen, but the purchasing power of people on benefits has fallen more

Development in real wages, benefits, and hourly productivity



Note: The chart shows the development in real wages, real benefits, and GVA per hour, where the former are deflated by HICP. Wages are defined with the remit of the Confederation of Danish Employers, while real benefits are defined solely on the basis of the development in benefits as a result of rate adjustments. Real benefits thus do not reflect discretionary changes in specific benefits, e.g., temporary measures such as inflation relief. The price deflators are shown for the private non-primary sector.
Source: Statistics Denmark, Confederation of Danish Employers, and own calculations.

In the medium term, a fall in real wages would usually be expected to lead to falling employment, as the income from working falls in relation to the consumption opportunity it generates. However, in the short term, some elements of household spending may be more or less tied up as a result of previous choices or strong consumer habits. For example, a gas boiler cannot be switched to district heating overnight, and debt (with variable interest rates) can only be gradually reduced. Therefore, years of high inflation and interest rate hikes, which have eroded household purchasing power and squeezed budgets, can lead to an increase in labour supply for some individuals.[34] Especially for liquidity constrained households, an increase in labour supply may have been necessary to maintain previous consumption. This is especially true for households with the lowest incomes, as inflation has been more pronounced for this group due to price increases for necessities such as heating, electricity and food being particularly high.[35]

[34] See Danmarks Nationalbank, Interest rate hikes affect the banks and their customers, *Danmarks Nationalbank Analysis (Financial stability)*, no. 6, June 2023.
[35] See Christoffer Weissert Jessen, Andreas Kuchler and Tobias Renkin, Inflation inequality in Denmark, *Danmarks Nationalbank Economic Memo*, no. 5, June 2023.

BOX 3

Wage developments in the private labour market in Denmark largely follow centrally agreed wage increases, although there is room for some wage drift

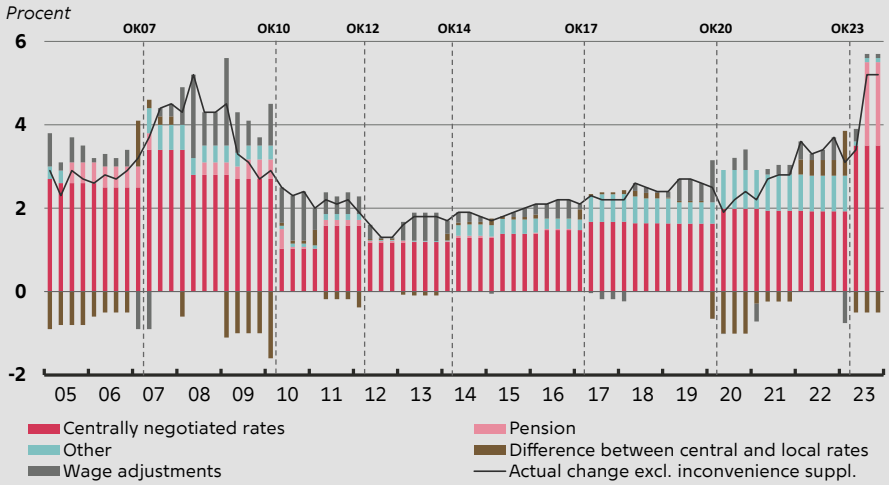
Three out of four employees in the private labour market are covered by a collective agreement. The part of the Danish labour market covered by collective agreements can be characterised by two types of wage systems: the minimum wage system and the standard wage system, of which the minimum wage system covers the vast majority.[1] The two wage systems differ primarily in the degree of centralisation in the collective bargaining. In the standard wage system, wage rates are typically set for a two to three year period through central negotiations, while rates in the minimum wage system are set through local negotiations at company and/or employee level. The fact that the framework for the wage development is agreed for a fixed period can lead to a certain rigidity in wages, deemed to be greater in the standard wage system.

The wage development in the private labour market largely follows the centrally agreed wage increases, see chart. This should be seen in light of the fact that local negotiations typically lead to salary increases close to those centrally agreed upon. However, the actual wage development has over a number of years often been slightly stronger than the sum of the contributions from central and local wage adjustments, which may suggest that economic conditions have developed differently than was expected at the time of the negotiations, e.g., as a result of changes in the pressure on the labour market or changes in companies' productivity and performance.

Wage adjustments beyond those centrally and locally negotiated were particularly evident in the period leading up to the financial crisis, when there was high demand for labour. Since then, however, the contribution from these adjustments has been significantly smaller. This is true even in recent years, when several indicators suggest that demand in the labour market has been higher than before the financial crisis. Through 2022 and part of 2023, the contribution from the wage adjustment to actual wages was positive but relatively small, which should also be seen in light of employees demanding wage increases in response to the sharp rise in inflation and loss of purchasing power during the period. Although there is some room for wage adjustments in large parts of the private labour market, the overall wage development generally follows the centrally negotiated wage increases.

CHART

The wage development largely follows the centrally agreed increases
Decomposition of wage growth into centrally and locally negotiated rates and contributions from wage adjustments



Note: Actual wage growth is for the manufacturing industry. The centrally negotiated rates are an average of the agreed rates for both the minimum and standard wage systems, i.e., the rates agreed in the Collective Agreement for Employees in Industry, the Collective Agreement for the Construction and Civil Engineering Sectors, the National Collective Agreement for Shops, the Collective Agreement, and the Transport and Logistics Collective Agreement. The locally negotiated rates reflect the agreed increases for hourly wage earners in the minimum wage system and can be both higher and lower than the centrally negotiated rates. Wage adjustments is calculated as the difference between actual wage growth and the sum of locally and centrally negotiated rates including pension and "other", including the free choice scheme.
Source: Confederation of Danish Industry, Confederation of Danish Employers, and own calculations.
[1] Employment Relations Research Centre (FAOS), *Facts*: *Minimum and standard pay*, 2020.

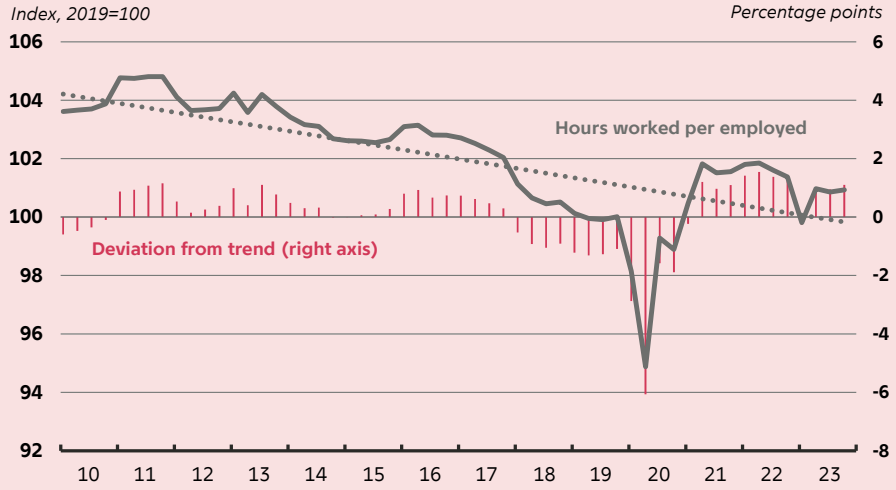
Average working hours are higher than before the pandemic

Labour demand can to a certain extent be met by increasing working hours. Since 2019, average working time, measured by hours worked per employed, has grown by around 0.9 per cent, see chart 18. This development is not seen to the same extent in the euro area and the US, where employment has increased more than hours worked, with average working hours falling 1.6 per cent in the euro area and 1.3 per cent in the US. This indicates that falling average working hours may have created a need for more employees abroad to meet demand. This is, however, not the case in Denmark. This development should be seen in the context of a longer trend of persistently lower average working hours in Denmark and abroad.[36]

CHART 18

Average working hours are higher than before the pandemic

Development in hours worked per employed in Denmark



Note: Hours worked are stated in the national accounts and are based on Statistics Denmark's enumeration of registered paid hours. The trend is calculated over the entire period 2000-2023.
Source: Statistics Denmark and own calculations.

[36] See Diva Astinova, Dissecting the decline in hours worked in Europe, *IMF Working Paper*, no. 2024/002, January 2024.

05

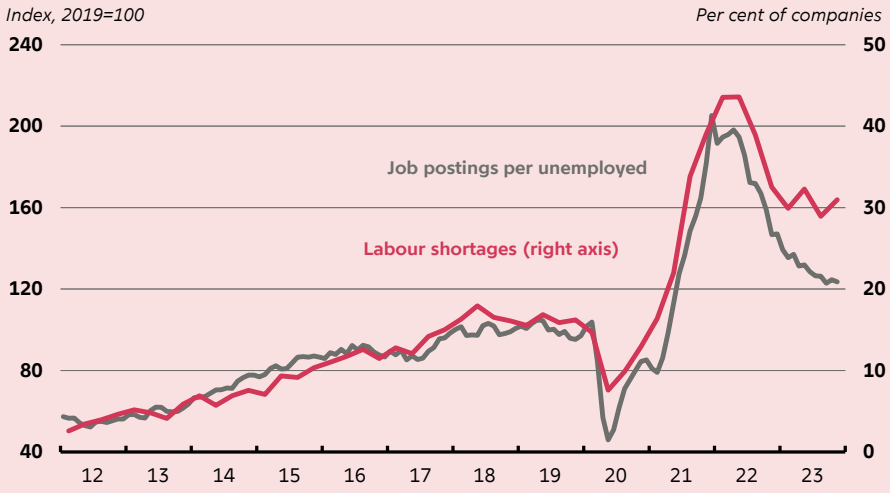
The pressure on the labour market has eased

The pressure on the Danish labour market seems to have eased. Since the end of 2021, the number of job postings per unemployed in Denmark has fallen significantly, see chart 19. However, it is still at a higher level than before the pandemic at the end of 2023, even when adjusting for companies' increased use of electronic postings over the period. Meanwhile, companies' reported labour shortages have decreased across industries since mid-2022 but are still at a higher level than before the pandemic about a year later. The development covers a declining, yet still high, shortage of labour in the services industry, while in the manufacturing and construction industries, it is approaching pre-pandemic levels. Finally, recruitment surveys by the Danish Agency for Labour Market and Recruitment also show that the number of unsuccessful recruitments has decreased since the end of 2021. The various indicators thus paint a picture of a Danish labour market on which the pressure has eased, but which remains tighter than before the pandemic.

CHART 19

Significant decrease in the number of job postings per unemployed and in the proportion of companies with labour shortages since the end of 2021

The development in the number of job postings per unemployed and the average proportion of Danish companies reporting that labour shortages are a constraint on production



Note: The chart shows a chain index for the number of job postings in relation to the development in the number of unemployed. The index for the number of job postings is chained at the company level, so that the growth in postings from month to month is based on the same group of companies in both months. *Labour shortages* are a weighted average of the proportions in manufacturing, construction, and services. The weights correspond to the industries' proportion of employment.
Source: Jobindex, Statistics Denmark and own calculations.

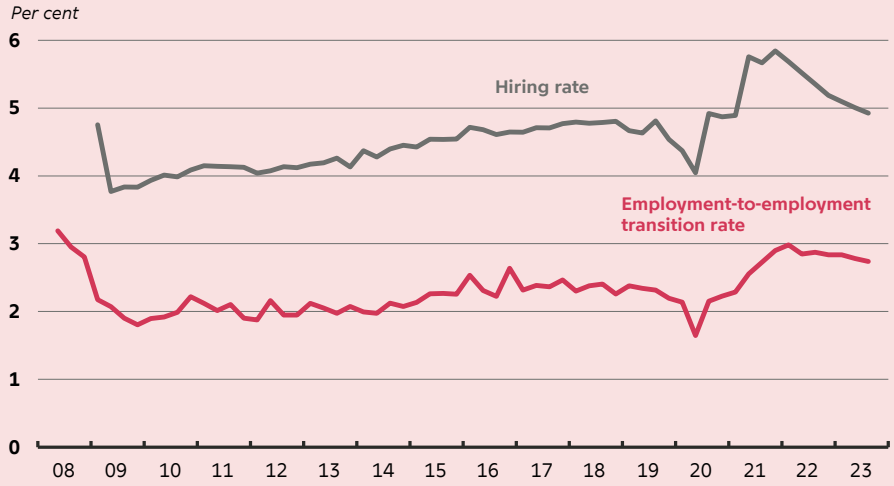
There are also signs of easing pressures on labour markets abroad. In both the US and the euro area, the number of job postings has also decreased relative to the number of unemployed in recent years, and a smaller proportion of companies report that labour shortages are constraining production.

The easing pressure on the labour market is also reflected in the job turnover. Since the beginning of 2022, the hiring rate for people both with and without other employment has decreased, see chart 20. At the same time, the proportion of employees changing employers has decreased slightly. This development should be seen in light of the declining demand for labour, which has been reflected in a significant drop in the number of job postings during the same period, see also chapter 3.

CHART 20

The proportion of employees switching employers increased in the wake of the pandemic, but has decreased in recent quarters

Development in hiring and employment-to-employment transition rates in Denmark



Note: The chart shows seasonally adjusted hiring and employment-to-employment transition rates in Denmark. *Hiring rate* measures the job turnover from Jobindsats each quarter in relation to the number of 15-74-year-olds in the population at the beginning of the quarter. The job turnover measures the number of new job matches, regardless of whether the person who has started a new job comes from unemployment, outside the labour force or from other employment. *Employment-to-employment transition rate* is calculated based on microdata and measures the number of employees who change employer each quarter in relation to the total number of employees in Denmark at the beginning of the quarter, see also box 4.
Source: Statistics Denmark, Jobindsats and own calculations.

However, the employment-to-employment transition rate remains relatively high. There could be a number of reasons for this. Firstly, competition to attract people who are already employed may have increased as a result of a prolonged period of low unemployment and recruitment difficulties in companies. Secondly, it may reflect the fact that employees have increased their search intensity for other jobs in the hope of negotiating wage increases beyond those agreed upon in the collective agreements. The latter may have been particularly pronounced

during this period because households expected higher inflation and thus greater erosion of their purchasing power for unchanged wages.[37]

The high rate of job switching among employed people may also have contributed to the weaker productivity growth during the post-pandemic expansion. While job switching enables an improvement in job matching in terms of employee skills in the long run, it is possible that in the short run it contributes to slightly weaker productivity due to the immediate loss of firm-specific human capital.

The easing pressure on the labour market is partly a consequence of the monetary policy tightening that rising inflation has led to. Tighter monetary policy reduces overall demand in the economy and thus the demand for labour. Although the price of labour still appears to be relatively low from the perspective of companies, the collectively agreed nominal wage increases combined with slowing inflation have led to relative prices in the Danish economy gradually approaching pre-pandemic levels since mid-2022. This may also have contributed to dampen the pressure on the Danish labour market.

BOX 4

Proportion of employer changes among employees can be calculated based on microdata

The series for the proportion of employees who change employers is based on microdata from Statistics Denmark. Specifically, data for job spells are combined from the register for wage earners, BFL, for the period January 2008 to March 2023 and the e-Income register for January 2023 to November 2023.[1] A job spell is defined as a match between the employee's ID number and the employer's registration number.[2]

First, the data is limited to observations where the reported monthly number of hours worked is greater than zero and to job spells with a duration of more than one month. In addition, the focus is on spells where the median number of hours worked is at least 100.[3]

We define a change of employer as a separation that leads to new employment in another company immediately after the previous spell ends. It is therefore not counted as a change of employer if a person has an interim period of no labour income between the previous and the new job. We also limit employment-to-employment transitions to separations that occur a maximum of three months after a person has started their new job.[4]

[1] Data from the e-Income register is provisional.
[2] Mergers and acquisitions are not taken into account. It is therefore considered a change of employer if an employee has a new employer (new CVR number) but remains at the same physical workplace (unchanged workplace number).
[3] This group contains a large proportion of people with multiple, short-term jobs, who change employer frequently and would have a significant impact on the number of employment-to-employment transitions.
[4] If there is more than a three-month overlap between the new and the previous job, it is considered an additional job rather than a change of employer.

[37] See Laura Pilossoph and Jane Ryngaert, Job Search, Wages, and Inflation, *Working Paper*, September 2023.

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