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**Research Report**

## Labour scarcity in Denmark: What role do foreign recruitments play?

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# DANMARKS NATIONALBANK

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## Labour scarcity in Denmark: What role do foreign recruitments play?

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## Labour scarcity in Denmark: What role do foreign recruitments play?

### Abstract

Over the coming years, the working-age population of native Danes is expected to fall substantially, and tailwinds from past labour market reforms will, to some extent, die down. As the structural labour force is expected to increase at a slower pace, international recruitments may come to play an even more important role in the Danish labour market. This memo shows that while only a small share of total recruitments come from abroad, foreign labour has contributed markedly to employment growth in Denmark, particularly in industries facing significant labour shortages. The influx of internationally recruited labour is no longer halted by the pandemic, and wage disparities continue to make Danish jobs attractive. Hence, Danish firms still appear to have the option of recruiting workers from abroad when domestic resources are scarce.

Danish firms are facing significant labour shortages, and unemployment has fallen to levels last seen before the Great Financial Crisis.<sup>1</sup> At the same time, labour market participation is quite high in a historical context. Over the coming years, however, demographic headwinds are expected to reduce the working-age population of native Danes substantially, and tailwinds from past labour market reforms will, to some extent, die down.<sup>2</sup> As a result, the structural labour force will increase at a markedly slower pace than seen over the past decade, questioning whether there is still scope for adjustments in labour supply.<sup>3</sup> This memo examines the role of international recruitments in the Danish labour market.

In recent times, the pool of workers that are relevant for hiring has expanded beyond the domestic labour supply. The enlargements of the EU since 2004 and the establishment of several work permit schemes for third-country nationals have made it easier for Danish firms also to recruit workers from abroad. Since the beginning of 2013, employment of foreign wage earners has increased by almost 160,000 persons, see Chart 1. It was at a record high in the first quarter of 2022, when the number of employees without Danish citizenship reached almost 360,000 persons, thus constituting almost 12 per cent of the workforce.<sup>4</sup> This marked increase in the number of foreign employees has accounted for more than a third of the increase in total wage-earner employment since 2013.

It could be argued that foreign labour has become an indispensable resource in the Danish labour market. Not only has foreign labour contributed to past expansions of the Danish labour force. Recent

<sup>1</sup> See Bess et al. (2022).

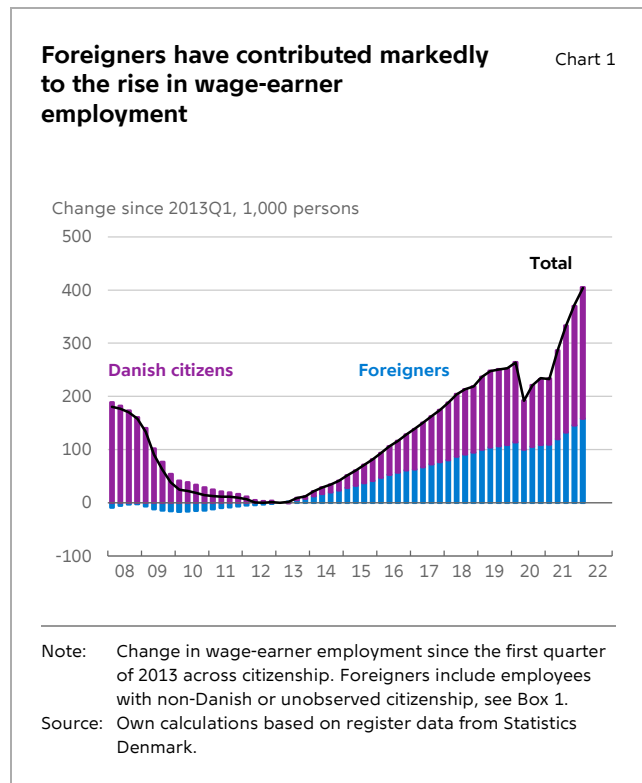
<sup>2</sup> According to Statistics Denmark's population projection for 2022, the number of native Danes of working age (15 to 74 years) is expected to fall by more than 60,000 persons from 2022 to 2030.

<sup>3</sup> The structural labour force is expected to increase by 23,000 persons from 2022 to 2030, which compares to an increase of 177,000 persons

from 2013 to 2021, cf. the Ministry of Finance's medium-term projections from August 2022.

<sup>4</sup> The workforce measure defines unemployment as people without a job who have been actively seeking work in the last four weeks and are available to start work within the next two weeks.

evidence also suggests that foreign labour helps to dampen overheating pressures during periods of strong demand.<sup>5</sup>

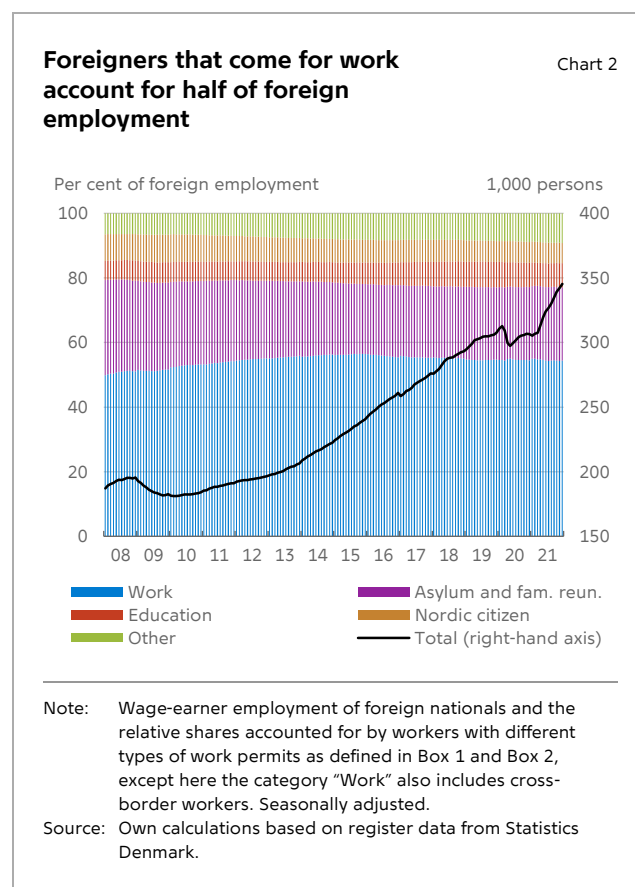


### Foreigners that come for work account for only half of foreign employment

To assess the potential to attract foreign labour in the coming years, an important distinction must be made between foreigners who come to Denmark for work and those who immigrate for reasons unrelated to Danish labour demand. In particular, in December 2021, only around half of the foreign employment can be attributed to those that come for work, while asylees and family reunifieds account for the majority of the other half, see Chart 2.

The rest of this memo focuses only on foreigners who come to Denmark for work. I define foreigners who come for work as the group of cross-border workers and foreign nationals that reside in Denmark on the

basis of a work permit or as accompanying family, see Box 1 and Box 2.<sup>6</sup> Using a combination of administrative and survey data from the Danish registers, this group of workers can be measured more precisely than in previous analyses. In particular, in contrast to previous work relying solely on administrative data, this memo also observes the basis for residence for foreign nationals who immigrated before 1997.<sup>7</sup>



Over the coming years, the development in foreign employment will likely reflect more than what can be attributed to those who come for work. Recently, many Ukrainian refugees have arrived in Denmark after fleeing the ongoing Russian invasion of their home country. They have already contributed to increasing the Danish labour force and may continue

<sup>5</sup> Adolfsen and Jensen (2019) show that the influx of EU migrants dampens business cycle fluctuations in EU countries to some extent. A similar result is found by Whitta-Jacobsen et al. (2018) for Denmark when looking at migrants from all countries and cross-border workers. Ho and Shirono (2015) also show that in the Nordic countries, economic migration, i.e., abstracting from flows of asylees, helps to dampen overheating pressures during periods of strong demand.

<sup>6</sup> On the one hand, the measure is somewhat understated, as it does not include Nordic citizens because their basis for residence is unobserved. On the other hand, it is slightly overstated, as asylum seekers who are employed in Denmark will count as cross-border workers because they are not yet part of the Danish population.

<sup>7</sup> See, among others, De Økonomiske Råd (2017).

to do so, although past experiences with integration suggest that it can take a long time for some refugees to find employment in Denmark.<sup>8</sup> Additionally, foreign students and other foreign nationals may continue to increase employment going forward.

### Foreign labour has previously contributed to labour force expansions in Denmark

Foreign citizens who come for work have contributed markedly to past expansions of the Danish labour force. Since the beginning of 2013 and until the end of 2021, the number of foreign employees who reside in Denmark for work or come as cross-border workers has increased by more than 80,000 persons. That represents a little more than half of the increase in total foreign employment of 150,000 persons in Chart 1. The remaining increase of around 70,000 persons can be attributed to non-work-related immigration, e.g. for asylum.

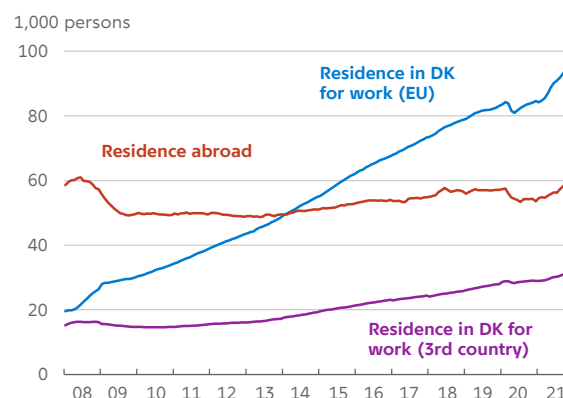
The increase in work-oriented foreign employment has mainly occurred among foreign nationals residing in Denmark, see Chart 3. They accounted for almost 70 per cent of work-oriented foreign employees in December 2021, whereas the rest reside abroad. For resident foreigners, employment has increased persistently since 2008, whereas the number of cross-border workers has fluctuated around a relatively stable level.

Most resident foreign workers are EU citizens, while citizens of third countries constitute a smaller share. This likely reflects that EU citizens have easier access to the Danish labour market. In particular, EU citizens can come to Denmark without a job at hand and stay for an unlimited time as long as they can prove that they are searching for work and have a real chance of getting a job.<sup>9</sup> In contrast, citizens of third countries have to apply for a residence and work permit after finding a job. The possibility of getting it depends on the worker's qualifications and whether they meet the requirements for one of the work permit

schemes, i.e., the Pay Limit Scheme, the Positive Lists, etc.

**The increase in employment of work-oriented foreigners has mainly occurred among resident EU citizens**

Chart 3



Note: Wage-earner employment of foreign nationals that come to Denmark as cross-border workers or reside in the country on the basis of "Work", as defined in Box 1 and Box 2. Seasonally adjusted.

Source: Own calculations based on register data from Statistics Denmark.

### International recruitments are no longer halted by the pandemic but relatively modest in scope

Foreign labour still appears to matter for the Danish labour market, and the influx of foreign workers is no longer halted by the pandemic. In particular, in 2021, there is a marked increase in the monthly influx of internationally recruited labour, see Chart 4. While part of the increase likely reflects postponed immigration in light of the pandemic, it may indicate that Danish firms still have the option of recruiting workers from abroad.

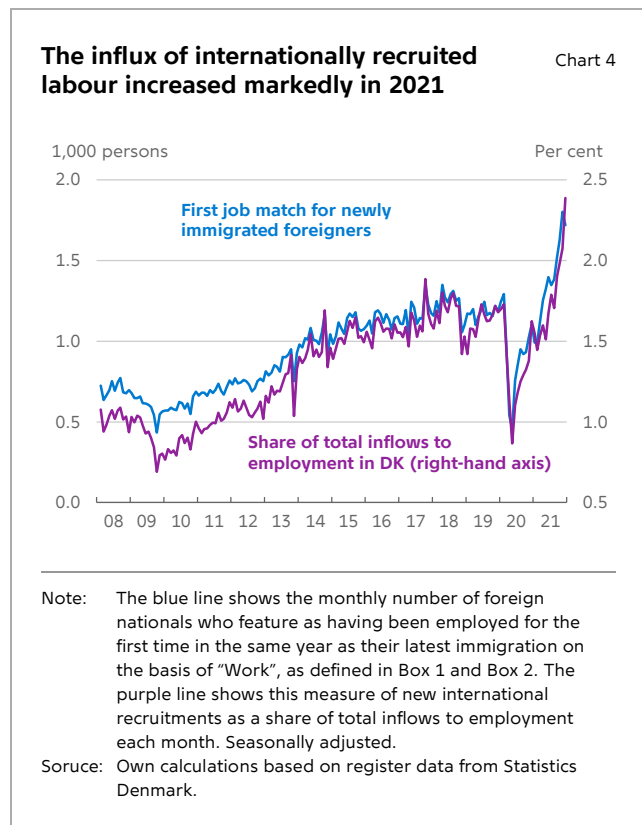
Nonetheless, Danish firms tend to only fill a small share of vacancies by recruiting workers from abroad. In December 2021, approximately 1,700 foreign nationals who immigrated during the preceding year featured as having been employed

<sup>8</sup> See Arendt et al. (2022a, 2022b).

<sup>9</sup> After six months EU citizens are required to document that they are searching for work and have a real chance of getting a job. After five

years of uninterrupted residence in Denmark, EU citizens have the right to stay for as long as they want.

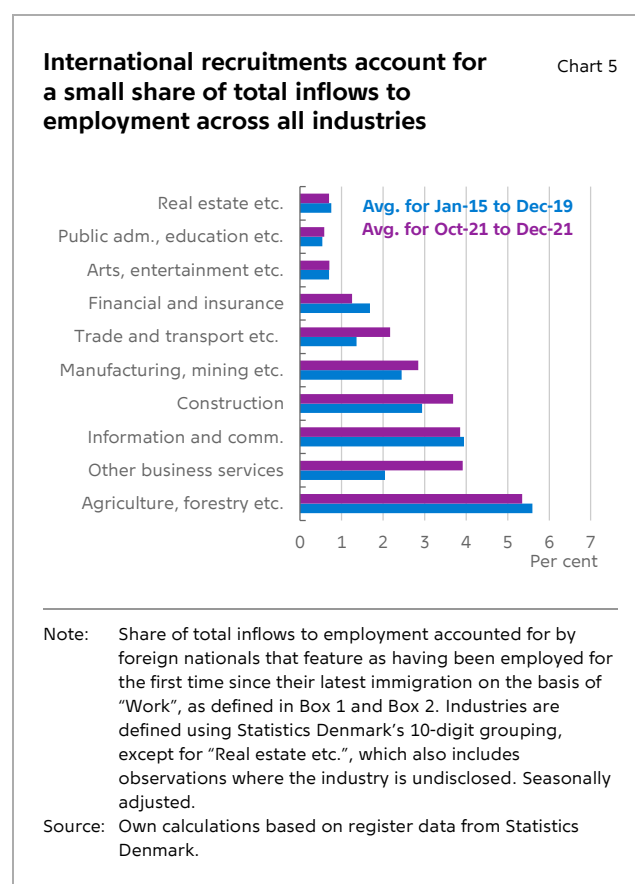
for the first time.<sup>10</sup> This corresponds to only around 2.4 per cent of this month's total inflows to employment.<sup>11</sup> Before the pandemic, the influx was even smaller and accounted for only 1.6 per cent of total inflows to employment.<sup>12</sup>



Notable differences are observed across industries, though the shares remain relatively small in all of them. The largest share is seen in *agriculture, forestry and fishing*, where new foreign recruitments accounted for 5.3 per cent of the industry's total inflows to employment in the average month of 2021Q4, see Chart 5. In *construction* and *manufacturing, mining and quarrying*, where labour shortages are currently significant, they account for 3.7 and 2.8 per cent, respectively. And, in *trade and*

*transport etc.*, which includes hotels and restaurants, they account for 2.2 per cent.

In most industries, shares are still around pre-pandemic levels, but in *trade and transport* and *other business services*, which includes cleaning services, they increased markedly over 2021. Finally, in some industries, new foreign recruitments only account for a minor share of total inflows to employment both before and after the pandemic recession, e.g., *public administration, education, and health*.



It may become increasingly difficult for Danish firms to attract foreign labour, as labour markets have also tightened in countries where foreign employees are

<sup>10</sup> A caveat to the measure is that it does not account for inflows to employment occurring before immigration, i.e., if a foreigner works as a cross-border worker for a few months before moving to Denmark. In particular, it does not account for new recruitments of cross-border workers.

<sup>11</sup> An inflow to employment is defined as receiving wages in the current but not in the previous month. A caveat to the measure is that it counts as an inflow if a person returns to the same firm after taking unpaid holiday or leave of absence. This means that the share accounted for

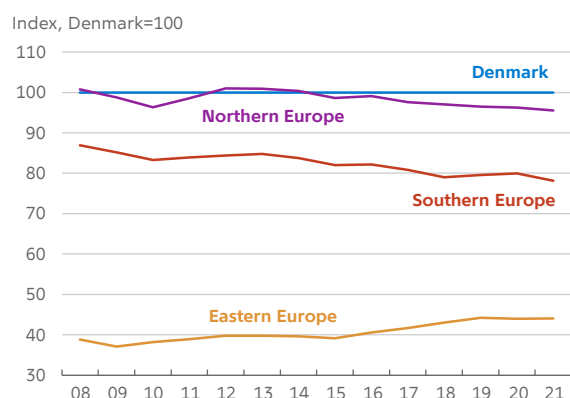
by new foreign recruitments is somewhat understated. However, the average share is only around 0.6 percentage points larger for the period January 2015 to December 2019 if such transitions are discarded for persons with up to six months without pay.

<sup>12</sup> These shares abstract from vacancies that get filled via job-to-job transitions. It means that international recruitments account for an even smaller share of total recruitments than what is captured by the measure depicted in Chart 4.

usually recruited from.<sup>13</sup> This is likely to reduce incentives for foreign workers to take a job in Denmark because it becomes easier to find employment in their home countries. Nonetheless, a job in Denmark may still be more attractive, as wages are generally higher than in other European countries.<sup>14</sup> The average wage level in Denmark is still significantly higher than in Eastern and Southern Europe, though the difference compared to Eastern Europe has become slightly smaller over time, see Chart 6.<sup>15</sup>

**Wage disparities continue to make Danish jobs attractive**

Chart 6



Note: Average wages of employees per hours worked in PPS for groups of countries relative to Denmark. Wages are measured as the total remuneration payable by an employer to an employee in return for work done by the latter, including social contributions paid by the employer. Northern Europe includes Belgium, Denmark, Germany, Ireland, Luxembourg, The Netherlands, Austria, Finland, Sweden, Iceland and Norway. Southern Europe includes Greece, Spain, France, Italy, Cyprus, and Portugal. Eastern Europe includes Bulgaria, the Czech Republic, Estonia, Croatia, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia and Slovakia.

Source: Eurostat, OECD, Macrobond and own calculations.

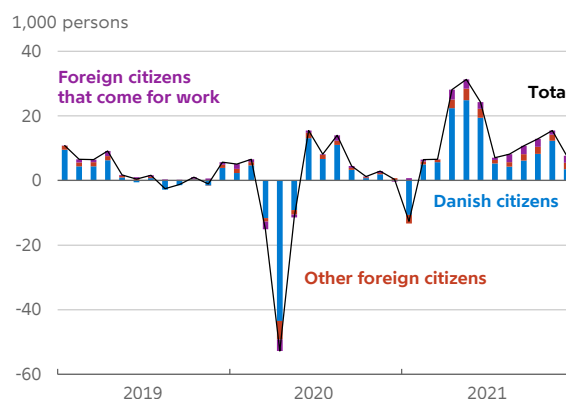
### Work-oriented foreign labour has particularly supported employment growth in some industries

International recruitments have also led to significant increases in employment in more recent years, see Chart 7. While the pandemic initially reduced the number of work-oriented foreign employees, the

recovery has been quick. From January 2020 to December 2021, employment of work-oriented foreigners increased by 19,000 persons, accounting for around 15.5 per cent of the increase in total wage-earner employment. The increase was primarily seen among those who reside in the country, as they accounted for around 13.6 per cent of the increase in total wage-earner employment.

**Over the past two years, work-oriented foreigners have accounted for 15 per cent of employment growth**

Chart 7



Note: Monthly change in Danish wage-earner employment. Foreigners that come for work are defined in Box 1 and Box 2, except here the category "Work" also includes cross-border workers. Seasonally adjusted.

Source: Own calculations based on register data from Statistics Denmark.

It is striking that resident foreign labour matters so much for employment growth in Denmark when new foreign recruitments tend to account for so few of the total inflows to employment. However, it likely reflects that labour mobility is generally high in Denmark. Workers often transition between jobs as well as in and out of employment, thus creating new job matches frequently.

Significant differences are observed in the relative importance of work-oriented foreign labour for

<sup>13</sup> Finansministeriet (2021) shows that in the European countries where Danish firms typically recruit foreign workers, an increasing share of firms reported labour shortages as a factor limiting production through 2021.

<sup>14</sup> Adolfsen and Jensen (2019) show that the influx of EU workers depends positively on relative GDP per capita in the receiving country and the home country of foreign workers.

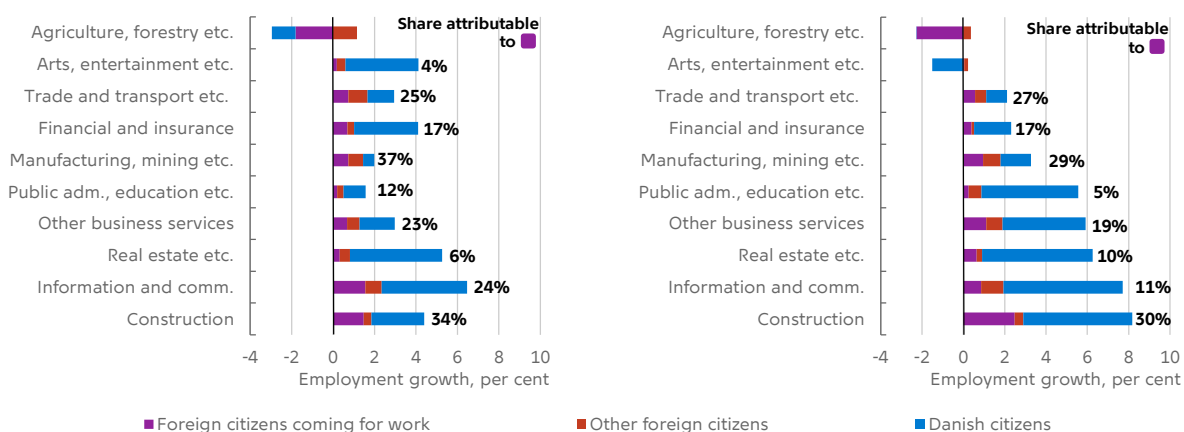
<sup>15</sup> Looking at purchasing power-adjusted GDP per capita instead of wages per employee does not change the picture notably.

### The relative importance of foreign workers for employment growth differs significantly across industries

Chart 8

Both when the upswing is balanced  
(Jan-18 to Dec-19)...

... and when the labour market is tight  
(Jan-20 to Dec-21)



Note: Contribution to growth in wage-earner employment across industries. The percentage shares shown next to the bars indicate the share of the total growth in the industry that can be attributed to growth in the number of foreign employees who have come for work. Industries are defined using Statistics Denmark's 10-digit grouping, except that "Real estate etc." also includes observations where the industry is undisclosed. Seasonally adjusted.

Source: Own calculations based on register data from Statistics Denmark.

employment growth across industries, see Chart 8. The greatest importance is seen in *agriculture, forestry etc.*, where work-oriented foreigners have accounted for almost the entire change in employment over the past two years. It is also quite high in *trade and transport etc.*, *manufacturing, mining and quarrying*, and *construction*, where the contributions to employment growth from work-oriented foreigners accounted for 27.2, 29.4, and 30.3 per cent, respectively, of the industries' total employment growth from January 2020 to December 2021.

The same picture emerges over the period from January 2018 to December 2019, when the upswing was more balanced. In the past, international recruitments thus appear to have particularly supported employment growth in industries that face significant labour shortages.<sup>16</sup>

These figures cover notable differences in total employment growth across industries. For instance, in *construction*, the total number of employees increased by 8.2 per cent from January 2020 to December 2021, of which 2.5 percentage points can be attributed to work-oriented foreigners. In comparison, an increase of 2.1 per cent was seen in *trade and transport etc.* with a 0.6 percentage point contribution from work-oriented foreigners.

A possible explanation for why foreign labour matters relatively more in some industries compared to others is that different industries demand different skills. In Denmark, returns to skills in the sense of wage premia are relatively low compared to other countries.<sup>17</sup> As a result, selection theory predicts that wage gains from moving to Denmark are declining in skills, and hence work-oriented immigrants are expected to be relatively low-skilled.<sup>18</sup> This is

<sup>16</sup> Bess et al. (2022) show that a large share of firms in these industries has reported labour shortages as a factor limiting production over 2021.

<sup>17</sup> Hanushek et al. (2015) find relatively low returns to cognitive skills in Denmark compared to other countries.

<sup>18</sup> See Borjas (1987) for an application of the Roy model to explain migration patterns. In this model, wage gains from moving are



consistent with empirical findings for Denmark.<sup>19</sup> It may suggest that foreign labour should matter the most in industries with relatively more low-skilled tasks, which seems to be the case. In particular, industries in which work-oriented foreign labour has previously accounted for large shares of employment growth are also among those that employ the largest shares of lower-skilled workers, e.g. *trade and transport etc., construction and manufacturing, mining and quarrying*.<sup>20</sup>

Another possible explanation is that the current rules for qualifying for one of the work permit schemes make foreign recruitments more feasible in certain industries. In particular, the majority of the resident non-EU workers have work permits under the Pay Limit Scheme, which is targeted at high-earning individuals with salaries above a specific threshold.<sup>21</sup> This may suggest that foreign recruitments are more accessible for industries with more high-paying jobs. However, this is probably not the sole reason behind the industrial differences, as the vast majority of resident foreign workers are EU citizens for whom such rules do not apply.

### New foreign recruitments may expand labour demand further

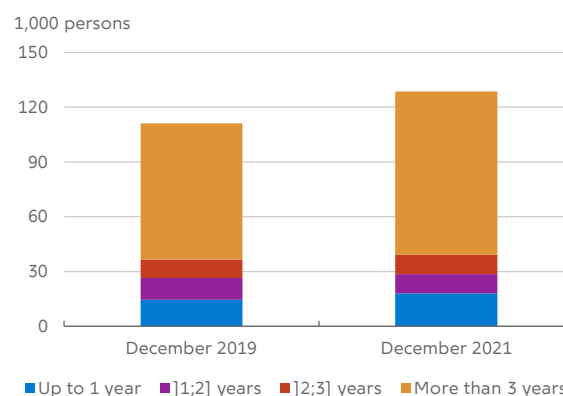
While foreign labour can help to support employment growth when domestic labour supply is scarce, it has opposing effects on labour market pressures. On the one hand, new foreign recruitments allow firms to fill some vacancies, thereby reducing labour shortages in the short term. On the other hand, foreign workers tend to expand consumer demand in the host country and, in turn, the demand for labour even further. In particular, Dustmann et al. (2017) show that immigrants spend a considerable amount of their income on consumption in the host country.

It could be that foreign workers are more inclined to spend their income domestically when they become more established in the host country. In Denmark, there is a tendency for foreign workers to have relatively long residence spells. In particular, in December 2021, the vast majority of resident foreign wage earners had lived in Denmark for more than three years, while only around 18,000 foreign employees had immigrated within the past year, see Chart 9. The same pattern was seen in December 2019 before the pandemic recession. This could indicate that the resident foreign workers are relatively established in Denmark.

Nonetheless, previous studies have shown that foreign labour does contribute to dampening overheating pressures in Denmark and other Nordic countries during periods of strong demand.<sup>22</sup>

**Foreign employees who have come for work have relatively long residence spells**

Chart 9



Note: Wage-earner employment of foreign nationals residing in Denmark on the basis of "Work" in December 2019 and December 2021, respectively, by years since latest immigration. For more information, see Box 1 and Box 2. Seasonally adjusted.

Source: Own calculations based on register data from Statistics Denmark.

declining in skills when returns to skills are higher in the source country than in the destination country.

<sup>19</sup> See Knigge and Lando (2018).

<sup>20</sup> Lower-skilled workers are defined as employees performing tasks at skill levels 1 and 2 in the international ISCO-08 classification, which distinguishes between four skill levels. For data on the industrial

distributions of employees performing tasks at different skill levels, see Statistics Denmark's table RAS300.

<sup>21</sup> By the end of 2021, a job offer with an annual salary of DKK 445,000 was required to qualify for the Pay Limit Scheme. As of 1 December 2022, this threshold is reduced to DKK 375,000 for a limited period of three years.

<sup>22</sup> See footnote 5.

## Characterising foreign labour

Box 1

The analysis of foreign labour is based on register data from Statistics Denmark. I define foreign labour each month as the subpopulation of wage earners that *do not* have Danish citizenship at the beginning of the year, i.e. residents with foreign or unobserved citizenship and cross-border workers. A caveat to the measure is that if a person obtains Danish citizenship during a year, they will count as foreign labour until the beginning of the next year.

### Residence

I obtain a monthly measure of residence for foreign workers using information on the latest immigration date. This is, however, an imperfect measure for several reasons. First, foreigners that immigrate and emigrate within the same year will count as cross-border workers throughout the year because immigration dates are only observed for those that reside in Denmark at the beginning of the year. Second, if a foreign citizen emigrates but continues to work in Denmark, they will not count as a cross-border worker until the beginning of the next year because emigration is only observed at a yearly frequency.

### Basis for the residence permit

I also observe the *latest* residence permit for the population of foreign nationals that reside in Denmark at the beginning of each year.<sup>1</sup> To obtain a monthly measure, I assume that residence permits are obtained at the time of immigration.

For foreign nationals who have immigrated from 1997 onwards, information on residence permits is based on administrative records from the Danish Immigration Service (Udlændingestyrelsen) or imputations by Statistics Denmark. For those who had the most recent immigration before 1997, it is based on survey data collected by Statistics Denmark in 2019, information from the Danish Immigration Service on residence permits granted in 1993-1996 or imputations by Statistics Denmark.<sup>2</sup>

I consider six different categories of residence permits, which are defined in Box 2.

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<sup>1</sup> Focusing on the latest residence permit means that if, for example, an EU citizen initially comes to Denmark to study but stays for work after finishing their education, they will feature with "Education" as the basis for residence during their study time, and "Work (EU)" afterwards.

<sup>2</sup> For more information, see Statistics Denmark.

## Categories of residence permits

Box 2

Foreign citizens who have immigrated to Denmark are divided into six different categories based on the observed basis of their residence permit.

### Work (EU)

This group includes EU/EEA citizens with a registration certificate based on paid employment or self-employment as well as accompanying family members. From 2021, it also includes British citizens with a residence status under the Brexit Withdrawal Agreement. A caveat to the measure is that it also includes those who had the most recent immigration before 1997 on the basis of sufficient funds or as old-age pensioners, which should feature as “Other” but cannot be distinguished from residence for work. This measurement error is, however, expected to be minor, as immigration before 1997 only constitutes a small fraction of employees from EU/EEA countries residing in Denmark for work.

### Work (Non-EU)

This group includes foreign nationals with a residence and work permit under the schemes for third-country nationals, including the Pay Limit Scheme, the Fast-Track scheme, the Positive lists, the Greencard scheme etc., as well as accompanying family members. Following Statistics Denmark, it also includes citizens of the new EU countries since 2004 who were covered by the Eastern Agreement and hence transitional arrangements for access to the Danish labour market until its expiry in 2009.

### Asylum and family reunification

This group includes all foreign citizens who have a residence permit based on asylum or family reunification according to the definitions of Statistics Denmark.

### Education

This group includes all foreign nationals residing in Denmark based on education, internships, au pair positions etc. It also includes students with a work permit and accompanying family members.

### Nordic citizen

For citizens of Sweden, Norway, Finland and Iceland, the basis of residence is unobserved, as they do not need a residence permit to live and work in Denmark.

### Other

Foreign nationals with residence permits other than those mentioned above, for example based on adoption, will feature with “Other” as their basis for residence. In contrast to Statistics Denmark, I also include undisclosed residence permits in this category, as well as EU citizens who reside in Denmark on the basis of sufficient funds or as old-age pensioners if they have immigrated from 1997 onward.

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