

DISCUSSION PAPER SERIES

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– A Register Perspective**

Fredrik W. Andersson
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ABSTRACT

COVID-19 and the Swedish Labor Market – A Register Perspective

The pandemic has mainly affected the state of health and mortality, but has also had effects on the economy and the labor market. This article reports what happened to the total number of employees, their distribution by sectors and regions and changes in the number of employees for different groups in 2020 compared with 2019 in Sweden. We do not deal with the development of the number and composition of the self-employed. We also do not go into the development of employees' conditions in terms of wages, working hours and working environment. But we are studying something that is in focus for the general debate: How was the development of the number of employees and their composition in 2020, "the first year of the pandemic"? The main result is that we find large differences in the development for different groups.

JEL Classification: I15, J15, J21, J23, J61

Keywords: Swedish labor market, COVID-19, employment, migrants

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The pandemic has mainly affected the state of health and mortality, but has also had effects on the economy and the labor market. This article reports what happened to the total number of employees, their distribution by sectors and regions and changes in the number of employees for different groups in 2020 compared with 2019 in Sweden. We do not deal with the development of the number and composition of the self-employed. We also do not go into the development of employees' conditions in terms of wages, working hours and working environment. But we are studying something that is in focus for the general debate: How was the development of the number of employees and their composition in 2020, "the first year of the pandemic"?

Covid-19 affects the economies and labor markets of all countries. However, there are major differences depending on the extent of the pandemic, the structure of the economies and the measures taken. A first comparison is to look at the development of the number of employees in Denmark, Norway and Sweden. There are three countries that have monthly statistics that make it possible to follow developments over the year in an equal way. Statistics Denmark and Statistics Norway regularly report statistics on how COVID-19 has affected the labor market. See Figure 1 for a comparison of developments in the three countries.

The figure shows that during the period from April to June during the pandemic year 2020, there was a marked decrease in the number of people employed in the three countries, but it also shows that there are significant differences between the three countries. The decline is strongest in Norway but much less prominent in Denmark. Sweden has a development that lies between it in the two neighboring countries. During the autumn, there was a significant recovery in the number of employees in all three countries, and in December 2020, the number of employees in the three countries was almost as many as in the same month in 2019. When we examine employment, we find major changes in their composition. We would like to emphasize that there may be other temporary and lasting effects, for example in terms of unemployment, which cannot be elucidated with the data we use.

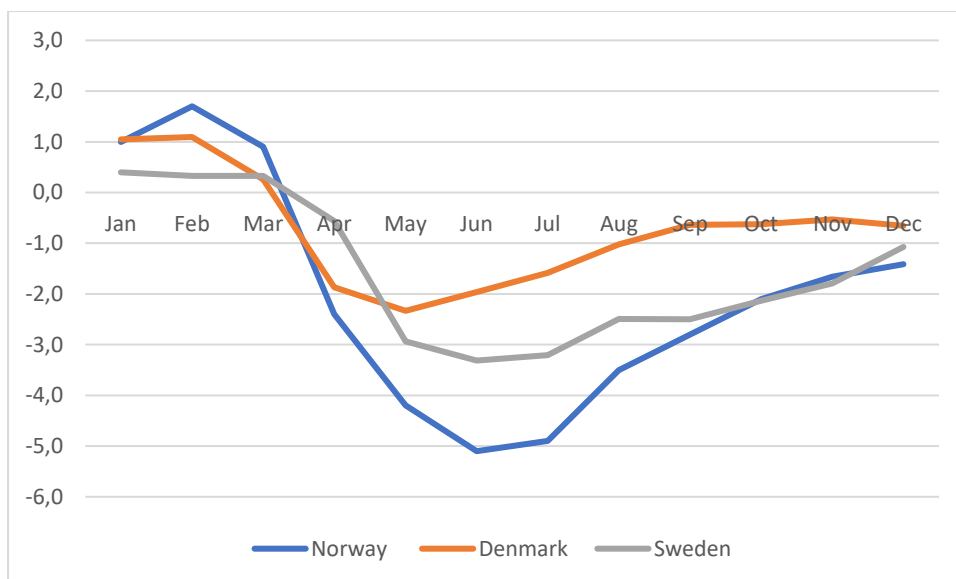


Figure 1. Percentage change of the number of employees in Denmark, Norway and Sweden between 2019 and 2020.

Source: Statistics Sweden, own calculations

Eurofound (2020, 2021) conducts surveys of developments during the pandemic regarding some aspects of the labor market and employment.¹ They show that the effects have been relatively small in Sweden during the initial months compared with other countries in the EU. Of those who answered questions concerning the labor market situation in July 2020, only 3 percent of those surveyed in Sweden stated that they became unemployed during the pandemic. It was the lowest in the EU, Spain had the highest with 16 percent (the EU average was 8 percent).²

1. The method used for our study

Like our neighboring countries Denmark (eIndkomst since 2010) and Norway (A-ordningen since 2015), Sweden has been collecting administrative labor market data on a monthly basis since January 2019. Employers in Sweden submit the form Employer declaration at individual level (AGI) to the Swedish Tax Agency for their employees every month. Limited

¹ See Forslund (2020) for an earlier discussion of the development of the labor market in Sweden during Covid-19.

² IZA (2021) contains reports on the development of the labor market in 13 countries, including a report on Sweden. It is possible to follow the development of the labor market in the UK through reports from IES (Institute for Employment Studies) and that in Germany through reports from IAB (Institut für Arbeitsmarkt- und Berufsforschung) which among other things shows that the development varied between different Länder in Germany.

companies with few shareholders who take salary from their company are counted as employees. However, AGI data are not available for other self-employed persons.

Employer based information on employees

The administrative data source AGI creates new opportunities to study labor market developments on a monthly basis. Previously, only information was available on an annual basis from employers, which made economic analyzes of the short-term development of the labor market impossible with the help of administrative registers. Now, on the other hand, great opportunities are opening up to be able to study at a detailed level which employment ends, for example with regard to gender, age, level of education, country of birth and industry. Differences between people who are and are not registered in Sweden, as well as individuals' parallel salary payments per month, can also be examined. It is a valuable complement to the information from the Labor Force Surveys (AKU), especially during a time when the pandemic affects parts of the labor market to varying degrees and better real-time data is in demand.

Differences compared to the Labor force surveys

There are differences between the AKU and the AGI data. The AKU, which is official labor market statistics, measures the number of registered persons who are employed, unemployed and outside the labor force through a random sample. The AGI data instead contains information on all salary payments that employers in Sweden make every month. The AKU measures employment during a specific measurement month, while in AGI accounts there is a lagging effect. This is because AGI captures when the individual's salary is paid and not when the work itself was performed. For permanent employees, this usually does not involve a measurement problem because the salary is paid at the end of the month in which the work was performed. For people who have a part-time job, on the other hand, it usually applies that they work during month t and at the end of the month they report the time worked to their employer, after which the salary is paid in month $t+1$. For an unknown number of employees, this leads to a lag between the period actually worked and the wage payment period. In Denmark, this has been resolved by stating in connection with eIncome being reported which work period the salary payment refers to. This means that Denmark has a more accurate dating of when changes occur.

Differences compared to the yearly register-based data (RAMS)

The register-based labor market statistics (RAMS) have been publishing statistics on the number of gainfully employed in November since 1985. The 2019 version of RAMS uses the AGI data as a source. In RAMS, individuals are defined as gainfully employed if they have an AGI task where the salary paid as a basis for employer's contribution exceeds SEK 99. In this article, we use the same income limit. If only gainfully employed people who are either employees or minority shareholders are studied, 4,773,000 individuals were registered in RAMS for November 2019. If only the AGI data is used with the same income limit as RAMS, 4,694,000 employees will be received for November. The difference is 79,000 individuals (1.7 percent). A partial explanation for more employees in RAMS is that temporarily absent individuals are included, for example that employees who are on parental leave are included with the help of data from the Swedish Social Insurance Agency. A subset of them are already identified today in the AGI data with the help of the parental benefit supplements that the companies pay and report.

2. The development of the number of employees in different parts of the economy

As stated in the introductory section, the number of people employed in Sweden decreased significantly during the late spring and summer of 2020 and then recovered during the autumn. But the differences in development are large between different parts of the economy and different groups.

Next, we will look at the development with a division of the economy into four sectors; state, regions, municipalities and the private sector, see Figure 2. We find that the number of government employees was approximately two percent higher in each month of 2020 compared with the same month in 2019, while the number of employees in the regions is largely stable for most of the year to increase sharply at the end of the year. In regions, many work in health and care but also in some other activities such as regional public transport. The number of municipal employees first decreased sharply but then recovered at the end of the year. There is much to suggest that many people who earlier in the year were employed in, for example, municipalities are again employed in December. One interpretation of this sharp rise in December 2020 is that municipalities and regions have used temporary employees in a different way than in 2019. The number of employees in the private sector, on the other hand, is lower each month from April 2020 compared with the same month in 2019.

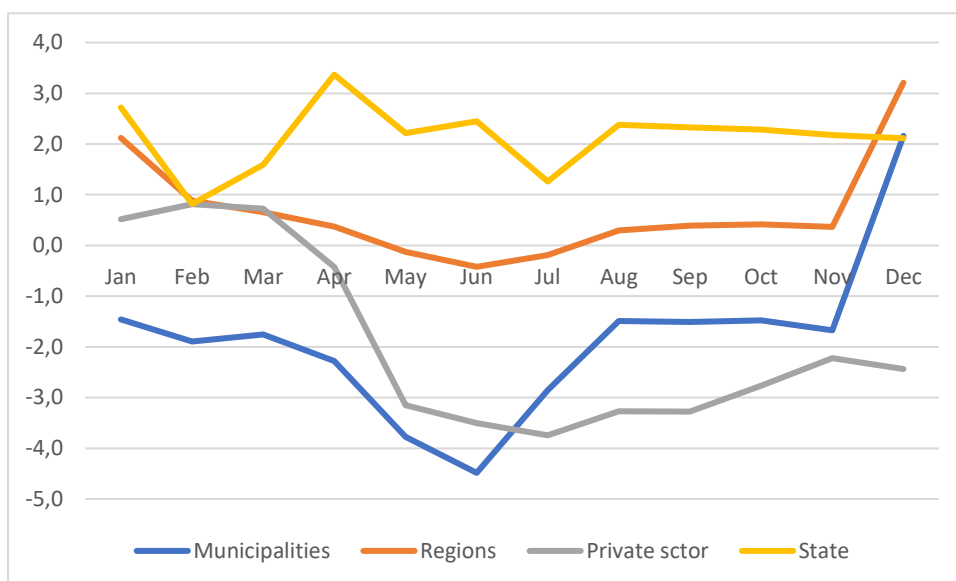


Figure 2. Percentage change in the number of employees according to sectors in Sweden between 2019 and 2020.

Source: Statistics Sweden, own calculations

The four sectors are not four unified operations. Within each sector, there are parts that have been affected in different ways by the pandemic. It is therefore interesting to look at the development with a division into industries. Significant differences can be found here. Here we will look at the number of jobs in December 2020 compared with in December 2019. The four industries with the largest decline in the number of employees are Hotels and restaurants with minus 22.3 percent, Culture, entertainment and leisure with minus 9.3 percent, Other service activities with minus 4.2 percent and Transport and warehousing with minus 3.5 percent. There are areas in these industries with significantly larger declines, such as hotels focused on conference activities in Hotels and restaurants and air transport and taxi activities in Transport and warehousing.

The largest increase in the number of employees is Mineral Extraction by 5.4 percent, an industry with few employees. For care, nursing and social services, the increase is 2.3 percent. Most other industries show changes of a few percent; either a small increase or a small decrease. There are also differences between different parts in these industries.

The fact that parts of the business community have not developed in the same way also leads to large differences in the development of the number of employees between municipalities and regions of the so-called night population. We will report the development for some

geographical breakdowns. Only in two regions has the number of employees increased between December 2019 and December 2020, Blekinge by 0.2 percent and Skåne by 0.1 percent. Västerbotten has managed third best. There, the development of the number of employees has decreased by 0.2 percent in 2020 compared to 2019. The most negative percentage has been in Värmland with minus 1.8 percent, Stockholm with minus 1.7 percent and Västra Götaland with minus 1.4 percent. The explanations are to search partly in the industry composition and partly the geographical location. The counties that have been hit hardest have had an unfavorable industry composition. An example is Strömstad, a border municipality to Norway located in Västra Götaland. Strömstad is the municipality that has experienced the largest reduction in the number of employees. In 2019, just over one in four of the municipality's residents was employed in Trade. The number of employees in Trade in Strömstad then decreased by 12.5 percent in 2020. This corresponds to about half of the total decline in the number of employees in Strömstad. This can be contrasted with the fact that the number of employees in Trade in the country as a whole decreased by 1.8 per cent in 2020. Värmland also has extensive cross-border trade in the municipalities bordering Norway. In Stockholm County, the number of employees in hotels and conference operations has instead decreased significantly.

It is interesting to see how labor market development differs between types of municipalities. We use the division used by the Swedish Association of Local Authorities and Regions (SKR) for a comparison, see Table 1. Before the pandemic, labor market development was divided in the sense that the labor markets of large cities and metropolitan municipalities grew, while the labor markets of smaller cities /towns and rural municipalities shrank. This transformation of the labor market seems to have continued to some extent during the pandemic, even though there is a decline in all municipal groups on an annual basis. The smallest decline has the commuting municipalities near big cities.

Table 1. Percentage change of the number of employees according to residence in different groups of municipalities between 2019 and 2020.

Municipality groups	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Year
Rural municipalities	-1,8	-3,9	-4,1	-2,3	-3,0
Rural municipalities with a visitor industry	-0,2	-3,6	-3,4	-2,0	-2,3
Commuting municipalities near medium-sized towns with a low commuting rate	-0,9	-2,9	-3,0	-1,5	-2,1
Small towns	-0,3	-2,3	-2,6	-1,3	-1,6
Commuting municipalities near a small town	-1,2	-3,2	-3,3	-1,7	-2,4
Commuting municipalities near a big city	1,2	-1,4	-2,1	-1,4	-0,9
Commuting municipalities near a medium-sized town	0,0	-1,9	-2,1	-0,9	-1,2
Big cities	0,9	-2,2	-3,0	-2,1	-1,6
Medium-sized towns	0,5	-1,9	-2,4	-1,4	-1,3
The total economy	0,3	-2,2	-2,6	-1,6	-1,5

Source: Statistics Sweden, own calculations.

3. The development of the number of employees in different groups

The fact that the development of the demand for labor has been different in different parts of the economy and the country has led to that individuals and thus groups of individuals have not been affected in the same way. Let us first study the development of women and men. Has it been similar or has it differed markedly? Figure 3 shows that women were affected somewhat more negatively than men during 2020, with the exception of the months of August and December. The difference can be explained by differences in occupational distribution - women have to a greater extent work in restaurants and hotels.

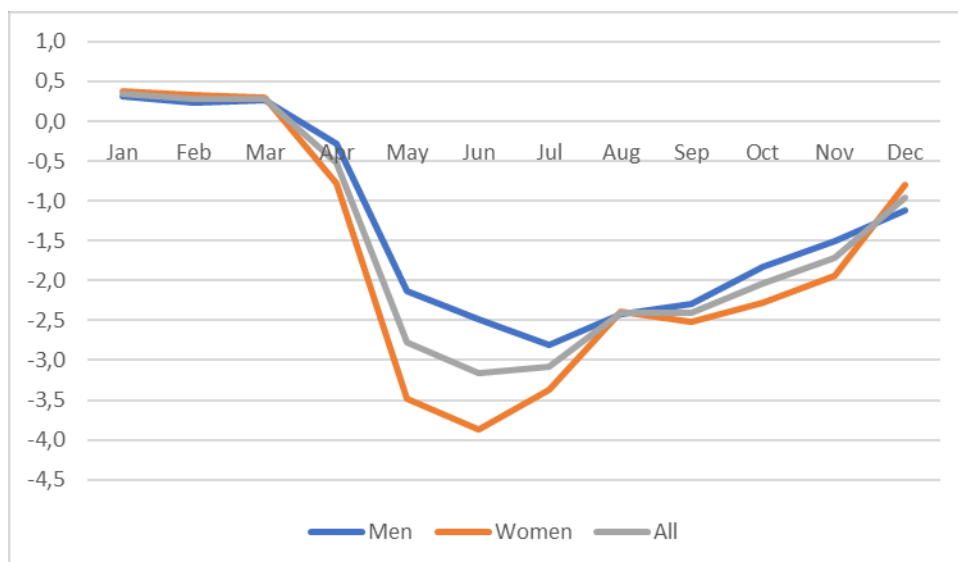


Figure 3. Percentage change of the number of male and female employees in Sweden between 2019 och 2020.

Source: Statistics Sweden, own calculations.

We will next present the development of the number of employees by age, see Figure 4. We find significant differences between age groups. The decline is very large in two age groups: those aged 16–19 and those aged 70 and over. We cannot see any decline during the first months of the year, i.e. before the pandemic, for these two groups, but then there is a very strong decline. There was some recovery at the end of the year, but the difference compared to the previous year is nevertheless negative and significant. For the youngest, the explanation may be that it has become more difficult to find a first job or a new job if they have lost what they have. For those who are 70 years and older, the explanation may be recommendations and restrictions aimed at this particular age group. Up to and including March 2020, an increase in the number of employees in this age group could have been observed, but with the pandemic, the trend towards ever higher employment among older people was broken. When we look at the development in 2020, we find that many of the 70 years and older who were employed at the beginning of the year were no longer employed during the summer months. Some returned to being employed after the summer, but overall there was a sharp decline. Even for younger people there are variations of the same kind, but they are smaller.

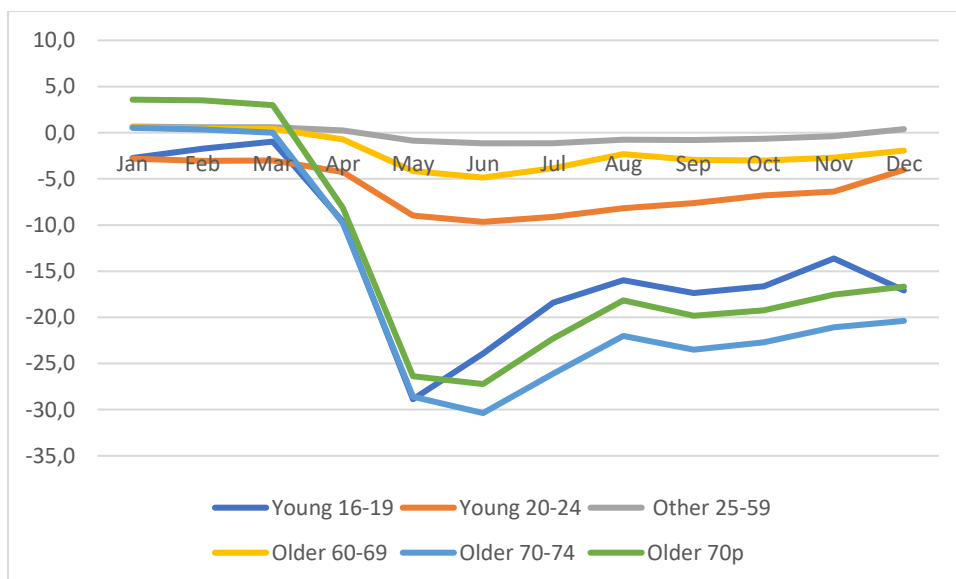


Figure 4. Percentage change of the number of employees in different age groups in Sweden between 2019 och 2020.

Source: Statistics Sweden, own calculations.

A decline in employment can also be seen among those aged 20–24.³ However, it is significantly smaller than for the two previously mentioned groups. The other two age groups (25–59 and 60–69 years) had only small declines. In particular, the decline is small for the 25–59 age group, just over 1 per cent. In this age group, the number of employees is almost completely unchanged throughout the year. At the same time, however, we emphasize that their conditions may have been affected in other respects, such as working hours, working environment, pay and other forms of remuneration.⁴

We will now study the development of the number of employees according to what education they have. Even when there are no pandemic times, there are large differences between education groups both in terms of the proportion who are employed and what conditions they have. Have the differences intensified during the pandemic or, on the contrary, have they weakened?

³ For the development of employment among young people in the United Kingdom during Covid-19, see Wilson and Papoutsaki (2021).

⁴ The increase in the total wage sum is 1.7 percent. Assuming that the wage development for the group of 25–59-year-olds had instead increased by 3 per cent (in the first quarter of 2020, the wage bill rose by an average of just over 3.9 per cent compared with the same period the year before), the group has lost a total of 19.5 billion in income in 2020.

In Figure 5, we see very large differences in the development of the number of employees between groups with different levels of education. Those with pre-secondary education as their highest education show the worst development. In order to be able to use administrative data, we have had to use the level of education for 2018. This means that many young people have had time to get a different level of education in 2020 than they had in 2018. Therefore, only the group 24 years and older is studied for those with only pre-secondary education. The decline is significantly greater for them than for those with upper secondary or post-secondary education as their highest.

Those with post-secondary education have done best. The effect of the pandemic follows the general pattern of the economy, the higher the level of education the higher the probability of being employed. It should be emphasized here that the comparison of education groups does not take into account differences in level or the development of wages and working environment.

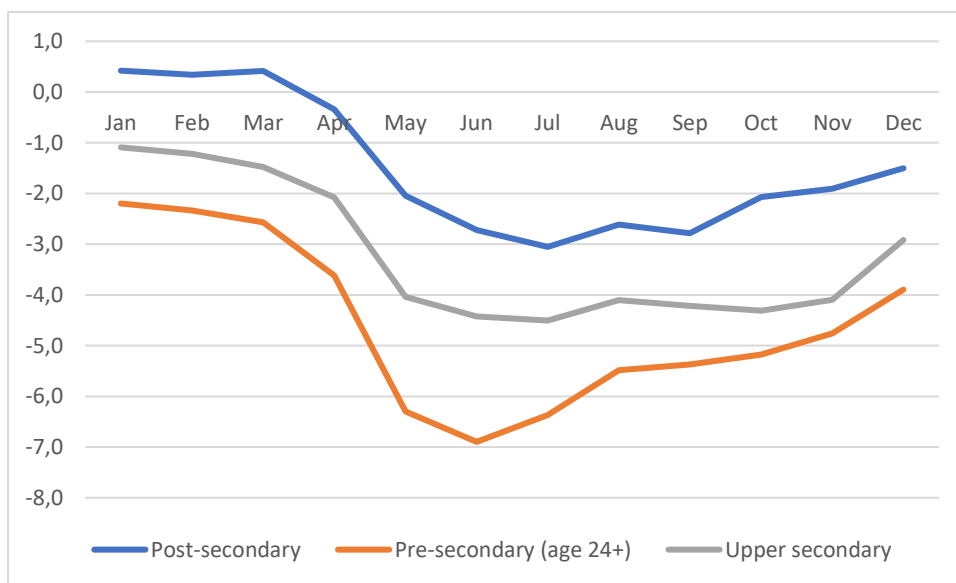


Figure 5. Percentage change of the number of employees according to education in Sweden between 2019 and 2020.

Note. Among those with less than secondary education only those 24 years and older are included.

Source: Statistics Sweden, own calculations.

The next comparison will be between those born in Sweden and those born in another country. The employment situation for those born in a country other than Sweden is has been

much discussed with special focus on the difficulties that many born in a country other than Sweden have to establish themselves in the Swedish labor market. Has their situation deteriorated further during the pandemic compared to that for those born in Sweden?

Figure 6 shows surprisingly that the development in the number of employees is significantly more positive for those born in another country than for those born in Sweden. This applies to all months during the year. For both groups, we find a decline during the period May–October when we compare 2020 with 2019, but the decline continues among those born in Sweden during the rest of the year, even if it gradually decreases. Among those born in a country other than Sweden, the number of employees is larger in December 2020 than in December 2019. It is important to underline that the development of the number of employees does not take into account differences in these groups' employment and changes in their demographic composition.

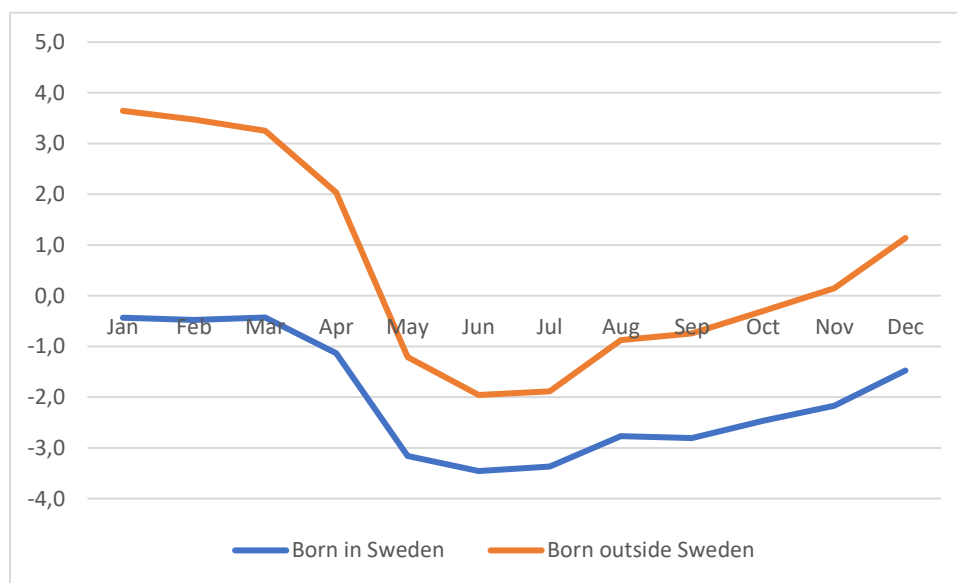


Figure 6. Percentage change of the number of employees according to country of birth in Sweden between 2019 and 2020.

Source: Statistics Sweden, own calculations.

One may ask what it is that explains this difference between those born in another country and those born in Sweden.⁵ We have therefore made a breakdown by country of birth in

⁵ Studies regarding other countries show a considerable worse development for the foreign-born. Se Brücker et al. (2021) for Germany, Borjas and Cassidy (2020) for the US, and Fasani and Mazza (2020) for a survey covering several European countries.

Table 2. We find significant differences. There is a significant decline in the number of employees among those born in the Nordic countries except Sweden and among those born in the former Soviet Union. On the other hand, the number of employees has increased significantly among those born in Africa and Asia, many of whom have come in recent years as refugees. We have made a division into age groups and compared the country of birth groups. We find that with the exception of the youngest (16–19 years) and the oldest (70 years and older) we see the same pattern. For those over 70, there are no major differences between the groups and among those aged 16–19, the decline in the number of employees is least among those born in Sweden. Where in the labor market do we then find the increase in employees among those from Africa and Asia? Many are in health and care and social services.

Table 2. Percentage change of the number of employees among those born in Sweden and groups of other countries in Sweden between December 2019 and December 2020.

Country of birth	Change (%)
Former Soviet Union	-5,9
The Nordic countries except Sweden	-5,5
Sweden	-1,5
South America	-1,1
EU28 except the Nordic countries	-0,0
North America	0,8
Europe except EU28 and the Nordic countries	0,9
Oceania	1,0
Africa	3,2
Asia	3,2
Total	-1,0

Note: The Soviet Union consisted of countries that now are classified as European or Asian countries.

Source: Statistics Sweden, own calculations.

The strongest year-round development in Africa and Asia has people born in Afghanistan (12.4 percent), Djibouti (10.4 percent), Pakistan (9.5 percent), Georgia (8.8 percent) and India (8.6 percent). However, the number of employees born in Djibouti is small (just over a hundred) as well as in Georgia (a thousand). The countries in which most registered foreign-born people are born have developed as follows: Iraq (-0.9 percent), Syria (3.7 percent), Iran (0.2 percent), Afghanistan (12.4 percent) and Thailand (-0.3 percent). There is thus a great heterogeneity within those from the two continents.

The country of birth group that shows the most positive development in terms of the number of employees is thus the one from Afghanistan. It is above all employment among people aged 20–24 that has increased significantly. Divided by industry, regardless of age, employment in the construction industry, trade, manufacturing, rental, education, real estate services, travel services, other support services and health and care are growing strongest.

In Sweden, therefore, the development in employment in 2020 has been somewhat surprisingly positive during the pandemic for those who came from countries where many of those who came were refugees. Developments in Sweden differ from those in other countries, where employment has developed negatively in various respects for this group. See Falkenhain et al. (2021) for Germany, Lee, Park and Shin (2021) for the United Kingdom and EMN (2021) for an overview.

We will now examine the development for those who belong to different income groups. If a low wage payment can be equated with a low-wage job, it was early in the pandemic that mostly low-paid jobs disappeared, see Figure 7. Even if there is some recovery, the number of jobs in the low-wage group has decreased in 2020. A partial explanation may be government requirements in order for companies to be able to use the support for short-term layoffs. In order to take part in this, the companies were more or less forced to get rid of the staff who were not permanently employed.

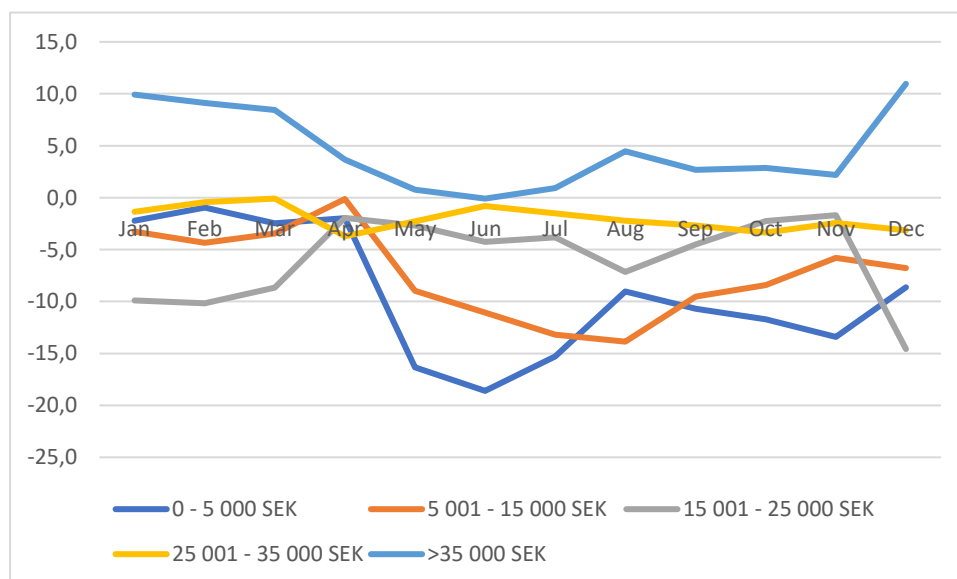


Figure 7. Percentage change of the number of employees according to income in Sweden between 2019 and 2020.

Source: Statistics Sweden, own calculations.

On the other hand, we see only a small decrease in the number with salaries between 25 and 35 thousand and the number with salaries higher than 35 thousand increases during all months of 2020 compared with the same months in 2019. The largest increase is at the end of the period. A partial explanation for the increase in the number of individuals with the highest salaries may be salary revision, i.e. that part of the group with slightly lower salaries has moved to the highest salary segment through salary revision.

We have performed regressions (logit) to see how different factors affect entry and exit from employment in the private sector. See Appendix. This has been done separately for the four quarters during 2020 and with control variables for the three months included in each quarter. Other variables that are included are education level, gender, age and country of birth (Sweden, Afghanistan, other country). The results from the regressions show that foreign-born people have both a greater probability of leaving a job and a greater probability of starting a job, which may reflect a weaker connection to the labor market. Those born in Afghanistan have less inflow to employment and, above all, less outflow from employment than others born in a country other than Sweden. Compared with men, women have both a lower probability of starting a job and a lower probability of ending a job. Of the three education groups, those with upper secondary education as their highest education have lower mobility than those with shorter and those with higher education.

4. People working but not living in Sweden

Not everyone who works in Sweden is registered as living in the country. The AGI data also contains data for this group, which in 2019 corresponded to just under 1 percent of all with AGI data. It is a heterogeneous group of employees.⁶ They can be, for example, those who live in another country and commute to Sweden or seasonal employees, for example those who work as berry pickers in Sweden in the summer but who live in another country. Another example is university students from another country who combine studies with work. The AGI material shows a much larger relative decline in the number of jobs performed by non-registered persons than for those registered in Sweden, see Figure 8. The

⁶ Some employers do not register when such employees are born so we are not studying the age composition of this group.

decline can be seen as a result of the restrictions on travel and migration that Sweden, like Sweden, other countries introduced during the pandemic.⁷

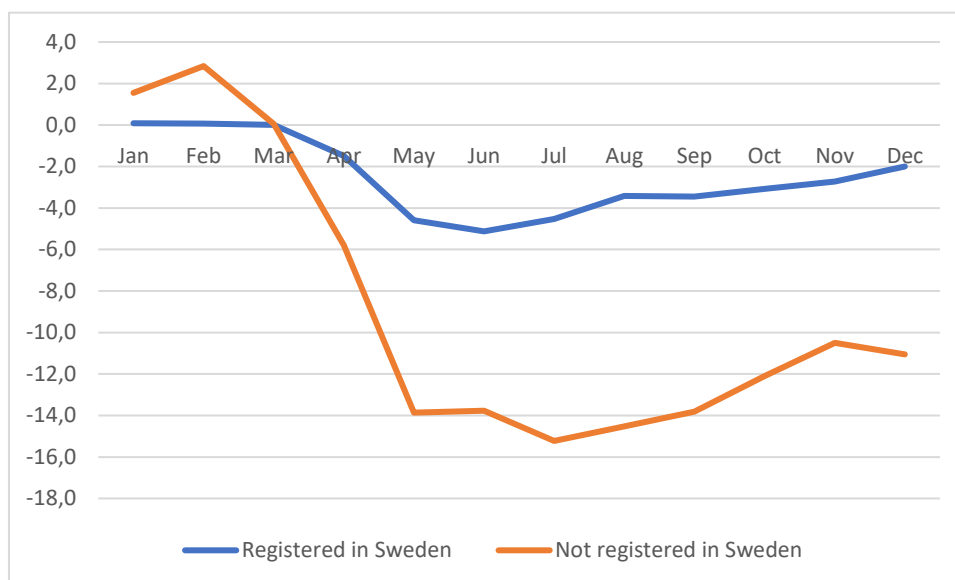


Figure 8. Percentage change of the number of employees according to if they are registered as living in Sweden or not in Sweden between 2019 and 2020.

Note: Only those with an income higher than SEK 99 are included.

Source: Statistics Sweden, own calculations.

The number of jobs is more than the number of employees in an economy as people can have more than one job at the same time or during the same month when changing jobs. The decline is greater for the number of jobs than for the number of employees. At most, the decline in the number of jobs was 5 per cent for the registered population, while it was 15 per cent for the non-registered population. There are large differences between different parts of the country in terms of the decline in the number of employees who are not registered and the percentage change in the size of the group. See Table 3, for data for the five municipalities that lost the most jobs for non-registered (number of AGI data) between 2019 and 2020.⁸

⁷ See EMN (2021) for a detailed survey of such policies in EU and OECD countries.

⁸ We use information of municipality of the employer and not that of the workplace.

Table 3. The five municipalities with the largest decline in the employees not registered as living in the municipality in 2020 compared to 2019.

Municipality	Change	Quarter 1 (%)	Quarter 2 (%)	Quarter 3 (%)	Quarter 4 (%)	All year (%)
Stockholm	-21 350	2,5	-14,5	-20,7	-18,1	-13,2
Göteborg	-6 950	-1,0	-17,8	-19,1	-18,6	-14,5
Solna	-2 800	-8,7	-21,7	-29,4	-23,5	-21,1
Strömstad	-1 950	-3,6	-25,6	-50,5	-54,2	-34,6
Malmö	-1 750	3,4	-9,2	-13,4	-3,2	-6,2

Source: Statistics Sweden, own calculations.

The same tendency can be observed in the change in the wage bill. See Figure 9. For the non-registered population, the decline was at most 11 per cent in July, while the decline remained at just over 1 per cent for the registered population. A strong contributing factor to the modest decline in the wage bill for the registered population was that the state gave companies the opportunity for financial compensation in the event of short-term layoffs of employees. A prerequisite for being able to take advantage of short-term layoffs was that the companies first got rid of all non-permanent employees.

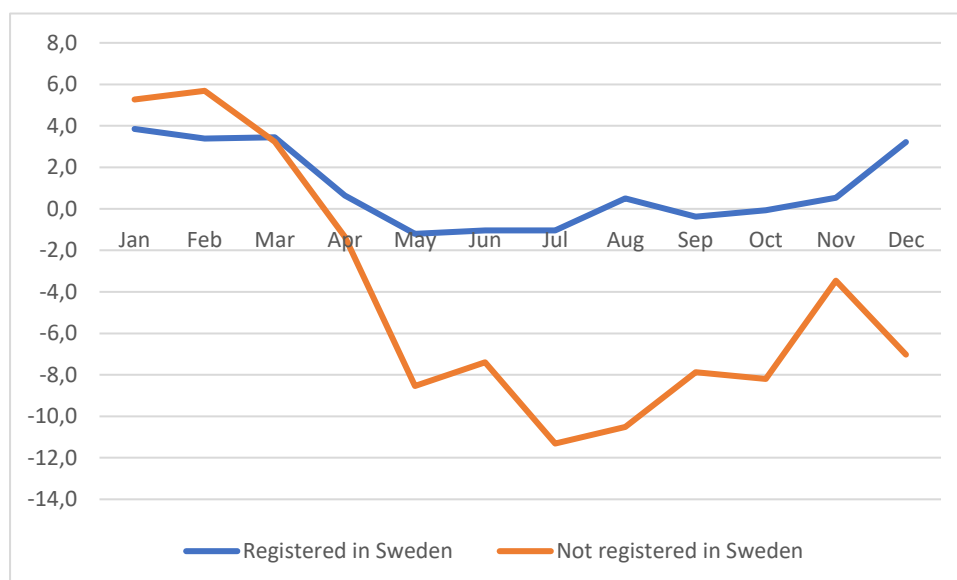


Figure 9. Percentage change of wage income according to if they are registered as living in Sweden or not in Sweden between 2019 and 2020.

Note: Only those with an income higher than SEK 99 are included.

Source: Statistics Sweden, own calculations.

5. Employees with more than one employer

Previously, it has not been possible to use administrative data to study the number of double-employed persons in Sweden. With the new AGI register, there is an opportunity to see how many individuals have at least two employers in the same month. The highest proportions being double employees are found in Other service activities (13.2 per cent in May 2019), Hotels and restaurants (12.9 per cent) and Culture, entertainment and leisure (12.7 per cent). Other service activities include employment in organizations for professions, employers, trade unions, as well as religious communities and political organizations. Having at least two employers can be a sign of being double-employed, but can also be a consequence of the individual changing employer and still receiving some form of payment from the previous employer. Unfortunately, it is not possible to distinguish this in the data. Figure 10 shows the development of the number of individuals with double AGI data with different delimitations of the group.

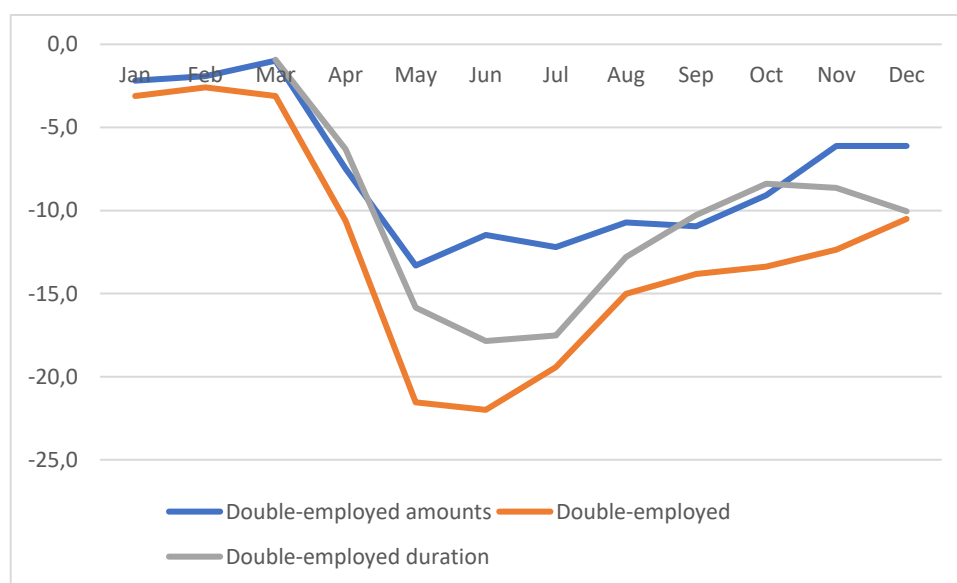


Figure 10. Percentage change between 2019 and 2020 of the number of individuals with two employers in the same month, with two employers the same month and one with at least SEK 10 000 and another with at least 5 000, and those with two employers the same quarter.

Source: Statistics Sweden, own calculations.

If we analyze the simplest model for double-employed (at least double AGI data during the same month), in May and June 2020 just over 20 per cent fewer people had double jobs compared with the corresponding months in 2019. The largest reduction in the proportion of

double-employed was in hotels and the restaurant industry; from 12.9 percent in May 2019 to 8.1 percent in May 2020.

The development of the number of individuals who change employers follows with about a month's lag the decline in the number of people with double work. See Figure 11 for the development of the number of employees who change employers. In Hotels and restaurants, which has lost the most jobs in the economy, the rate of employer changes was 6.2 percent both between May and June 2019 and between May and June 2020, and decreased in the following months. Approximately one of four individuals who changed employers remained in the industry during May 2020, while the corresponding proportion in May 2019 was 40 percent. In May 2019, the hotel and restaurant industry had the highest mobility in the economy.



Figure 11. Percentage change between 2019 and 2020 of the number of employees who change employers.

Source: Statistics Sweden, own calculations.

6. Summary

With monthly employer data for employees combined with data from other registers, it is possible to examine the development of the number of employees and their composition in 2020 compared with the corresponding figures from the year before, 2019. We will here summarize the main results from our survey.

- a) The number of employees decreased sharply from March 2020, but recovered later in the autumn and was at the end of 2020 only slightly less than in the same month in 2019. For the full year, the number of employees decreased by 1.5 percent.
- b) There are significant differences in the development of sectors. The number of employees in the state increased slightly in 2020 compared with 2019, while there is a clear decrease in the private sector. For those employed by regions and municipalities, there are variations during the year, but at the end of the year there is an increase.
- c) Differences are greater between industries than between sectors. Some industries such as the hotel and restaurant industry and the cultural sector show large declines, while the decline is smaller in others. There are parts of industries that have had even greater percentage declines in the number of employees than the industry they are part of as a whole has had. Some industries are showing an increase. One example is the mining industry.
- d) There are significant differences in development between different municipalities and regions. The largest cities have the largest decline in absolute numbers, but relatively speaking, the decline in the number of employees is greatest in other municipalities, such as Strömstad, a municipality where many are employed in cross-border trade or tourism.
- e) If we look at the development of the number of employees according to the level of salary payments the employees have, we find that by far the largest decline is among those with low salaries.
- f) The number of employees decreased more among women than among men during the first months of the pandemic. At the end of 2020, the decline is about the same for women and men.
- g) When we examine the development of the employment for age groups, we find that it is above all two groups that have been affected very strongly. These are those in their teens (16–19 years) and those who are 70 years or older (the group primarily affected by restrictions and recommendations). For other age groups, the changes are small.
- h) A comparison of education groups shows that the decline has been greater for those with pre-upper secondary education as their highest education than for those with higher levels of education (upper secondary or higher education).
- i) A comparison of those born in Sweden and those born abroad shows that the decline in the number of employees has been smaller for those born abroad than for those born in Sweden. If we divide into groups of countries, we find that among those who

are born in Africa and Asia, who are often refugees, the number of employees has increased.

- j) A group that has a sharply reduced the number of employees is those who are not registered in Sweden, such as border commuters and seasonal employees. It can be seen as a sign of a sharp decline in cross-border labor mobility during the pandemic. Will this change persist after the pandemic?
- k) There are other changes that are important to note: fewer have more than one job (something that can affect the financial situation of households) and fewer change employers. Labor market mobility has declined.

What can the development be expected to be after 2020? Has the development in 2020 continued in the same direction in 2021 towards an increased number of employees and will it become even more marked in 2022? The answer is of course very much due to the development of the pandemic. We can expect that some industries will recover and by that also the number of employees in them. But it is not certain that the recovery will be complete. New designs may have been established with more of homework, online shopping and video conferencing. This in turn can affect, among other things, retail, the travel sector and hotel operations. And what happens to the young people who did not get their first job in 2020? It is important to continue to follow developments to see what remains of a changed pattern after the pandemic.

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Appendix

Table A1: Inflow of employees between month t and $t-1$. Each quarter consists of three months inflow of employees. Coefficients are presented as odds ratios.

Logit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Female	0.821*** (-48.917)	0.823*** (-48.776)	0.877*** (-34.728)	0.816*** (-50.003)
Foreign born not in Afghanistan	1.110*** (21.741)	1.057*** (11.511)	1.194*** (38.670)	1.140*** (26.777)
Born in Afghanistan	1.032 (1.261)	0.981 (-0.748)	1.078*** (3.199)	1.069*** (2.637)
Pre-secondary education	1.409*** (68.163)	1.322*** (56.546)	1.544*** (95.857)	1.244*** (42.384)
Post-secondary education	1.266*** (52.621)	1.166*** (34.657)	1.293*** (58.718)	1.175*** (35.808)
Age 16 – 24	1.520*** (84.436)	1.718*** (110.633)	2.167*** (167.982)	1.438*** (70.147)
Age 65 and older	1.688*** (77.166)	1.989*** (103.485)	2.081*** (106.027)	2.723*** (156.792)
Wage income < 18 000 SEK	10.31*** (491.511)	11.77*** (512.396)	9.175*** (498.430)	11.42*** (496.753)
Manufacturing	1.026*** (4.815)	0.886*** (-24.371)	1.088*** (17.954)	1.117*** (20.497)
Second month	1.105*** (21.166)	0.946*** (-11.494)	0.670*** (-92.737)	1.076*** (15.124)
Third month	1.129*** (25.924)	1.344*** (66.113)	0.674*** (-91.543)	1.204*** (39.395)
Constant	0.00985*** (-803.999)	0.0113*** (-801.182)	0.0140*** (-841.136)	0.00905*** (-783.474)
Observations	9 274 148	9 183 327	9 291 213	9 150 763
Pseudo R ²	0,1628	0,1864	0,1884	0,1860

Exponentiated coefficients; t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A2: Outflow of employees between month $t-1$ and t . Each quarter consists of three months outflow of employees. Coefficients are presented as odds ratios.

Logit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Female	0.898*** (-27.929)	0.898*** (-27.929)	0.902*** (-26.451)	0.824*** (-49.007)
Foreign born not in Afghanistan	1.295*** (57.570)	1.295*** (57.570)	1.135*** (26.970)	1.112*** (22.014)
Born in Afghanistan	1.168*** (6.646)	1.168*** (6.646)	0.948** (-1.997)	0.965 (-1.429)
Pre-secondary education	1.359*** (63.624)	1.359*** (63.624)	1.291*** (51.963)	1.178*** (33.333)
Post-secondary education	1.092*** (20.234)	1.092*** (20.234)	1.161*** (34.661)	1.131*** (27.639)
Age 16 – 24	1.489*** (82.176)	1.489*** (82.176)	1.422*** (68.716)	2.046*** (149.272)
Age 65 and older	2.614*** (156.673)	2.614*** (156.673)	2.986*** (171.753)	2.048*** (102.381)
Wage income < 18 000 SEK	11.21*** (524.319)	11.21*** (524.319)	7.370*** (442.433)	10.89*** (503.031)
Manufacturing	1.046*** (9.563)	1.046*** (9.563)	0.969*** (-7.224)	0.649*** (-97.706)
Second month	1.103*** (19.148)	1.103*** (19.148)	0.995 (-0.962)	0.950*** (-10.289)
Third month	1.390*** (75.041)	1.390*** (75.041)	0.886*** (-26.878)	0.618*** (-106.690)
Constant	0.00905*** (-814.147)	0.00905*** (-814.147)	0.0155*** (-798.691)	0.0161*** (-807.019)
Observations	9 356 077	9 210 895	9 260 209	9 178 923
Pseudo R ²	0,1819	0,1921	0,1374	0,1910

Exponentiated coefficients; t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$