Department of Economics
NEKH02
VT 2021

LUND
UNIVERSITY

Labour market mechanisms

- An empirical study of policies and institutions on the general labour market and the short term effects on the Swedish labour market during the Covid-19 crisis

Author:
Skeppås, Emanuel

Supervisor:
Grodecka-Messi, Anna

Date:
2021-05-26

Abstract

This thesis looks at labour market mechanisms for 13 advanced countries and narrows down the focus to the Swedish labour market during the Covid-19 crisis. We concluded that short term unemployment benefits are correlated with a decrease in the unemployment rate while trade union density and public unemployment spending for a longer period is correlated with an increased unemployment rate. The thesis also discusses other factors that are important for understanding unemployment. Such factors include the quality of job matching and increased consumption. The Swedish labour market during the Covid-19 crisis has changed. We have seen greater unemployment, fewer working hours per worker and week and fewer employment opportunities by looking at the total hours worked per week for different industries. Greater unemployment likely caused by aggregate demand factors and restrictions to contain the spread of Covid-19. Average working hours have been affected by the same factors but also due to furlough schemes put in place by the government. From the total weekly hours worked data we concluded that some industries saw a decrease while some did not. An asymmetric effect of fewer employment opportunities has occurred. The most impacted have been the already low-paid workers in the economy.

Keywords: *Unemployment, Labour market, OECD, Sweden, Covid-19, Macroeconomics*

Table of contents

1. Introduction

In this thesis, we analyse the labour market and unemployment. We are mainly answering two questions.

The first question that we answer is which institutions, policies and factors affect the labour market. We also discuss how these factors impact the labour market and unemployment.

The second question that we answer is how the labour market has changed during the Covid-19 crisis. We look at the unemployment rate, the average working hours per week and per worker and the total weekly working hours in 8 different industries. We look at how these measurements of the Swedish labour market has changed after the Covid-19 crisis.

The thesis is divided into two parts. In the first part of the thesis, we start by discussing the general pre-Covid-19 crisis labour markets in several OECD countries. We discuss and analyse which factors affect the labour market in general and why they affect the labour market as they do. Whether the different factors are related to higher or lower unemployment is also analysed. We then narrow the focus down to how the Swedish labour market functions in pre-Covid-19 times. Finally, we analyse the impact on the Swedish labour market during the Covid-19 crisis. We conduct a discussion of what these changes in the labour market imply and why they have happened.

We answer the first question using 13 OECD countries. The reason we use the 13 OECD countries that we use was to get a broad analysis of labour markets with different policies and institutions. All countries are in a similar stage of economic development but with different institutions and policies. The period 2001 to 2015 is analysed. We analyse this period to see how the labour market works during non-Covid-19 crisis times. We analyse what affects the unemployment rate and use the following data/variables to do so: unemployment benefits after two months, trade union density, GDP, inflation, public spending on unemployment.

The reason we try to answer the first question is to see what effects well-known labour market policies and institutions have on unemployment. We can see if the intended outcome of these policies matches the effects on the labour market. Other factors and their relation to the labour

market can help us to better understand why we have the unemployment rate we have and what we can do to minimize it.

The second question is specific to the Swedish labour market. The reason we only analysed one country's labour market during Covid-19 is to get a deeper analysis of that labour market. The reason this country was Sweden is due to the stringency of containment policies in Sweden. Many other countries had vastly more stringent policies. Sweden (at least in the beginning) was the odd one out (Bricco *et al.*, 2020).

The reason we try to answer the second question is to see how the different aspects of the labour market have been affected during the Covid-19 crisis. We use three different variables to test these different aspects.

The first variable we analyse is the unemployment rate. The unemployment rate is a widely used labour market measurement. By analysing the change in the unemployment rate during the Covid-19 crisis we can thereafter discuss which policies need to be implemented to get the unemployment back to pre-crisis levels.

The second variable we analyse is average working hours per week and worker. By analysing the average working hours, we can see the impact on the people who did not get unemployed. Average working hours indicate two different things. The first thing it indicates is how much time a worker is spending accumulating wage. The work compensation most likely decreases if the average working hours drastically gets lower while the hourly wage remains the same. The second thing is how much time is spent producing products and performing services. We can start to discuss which policies need to be implemented to dampen the impact on companies and workers when we know what the change in average working hours has been.

The last variable we analyse is the total weekly working hours for different industries. By knowing which industries were more impacted than others, we can allocate the resources in society to those who have seen the largest decrease in working opportunity during the Covid-19 crisis.

We used two different methods to analyse the labour market.

The first method we use is regression analysis. We use data regarding several different factors (most of them related to the labour market) to explain the change in the unemployment rate. This method is used to answer our first question. Data from the 13 OECD countries are used during the period 2001-2015. We do one test using this method.

The result of our first test is that short term unemployment benefits, GDP, inflation were negatively correlated with unemployment. Trade union density and expenditure on cash benefits for unemployed people were positively correlated with unemployment.

The second method is a version of an event study that we use to analyse the effect of a particular event on a variable. The event, in this case, is the Covid-19 crisis. A period before and after the event is used and compared in this method. If there is a change in the data (a change in the mean or variance) we conclude that the data has changed after the event. We performed three tests using this method. One with the unemployment rate, one with average working hours per week and per worker and one with the total weekly working hours for different industries with the industry as the main variable of interest. The unemployment rate and the average working hours per week and workers are used to see the short term impact on these variables during the Covid-19 crisis. The total weekly working hours per week and industry are used to see differences in working opportunity between industries during the Covid-19 crisis.

The result from the first event study where we test the unemployment rate was that there had been a significant increase. From the second test where we test average working hours, we conclude that there has been a significant decrease in average working hours. Finally, in the third test where we test different industries and the total working hours in these industries, we conclude that some industries have seen a change while some had not. The industries where the total working hours have changed are commerce, hotels and restaurants, manufacturing and extraction, energy and environment, manufacturing of engineering goods and public administration. The industries where we could not say that there has been any change are financial activities and business services, health and social care and transport.

The thesis is divided into seven sections. We start by looking at the theories and earlier research before we start to analyse the real world. The real-world analysis is firstly focused on

the general labour market. The second focus is on the labour market in Sweden during the covid-19 crisis.

The first section, which is the one we are currently on, is the introduction.

The second section of the thesis includes a literature review and discussion of macroeconomic theories from the book "Macroeconomics a European text" by Michael Burda and Charles Wyplosz 7th edition.

In the literature review, we discuss earlier research regarding the two questions that we are answering. That is, we start by discussing research regarding which factors in the labour market affect unemployment. We then proceed to discuss research regarding whether the labour market in Sweden has been affected since the beginning of the Covid-19 crisis.

After the literature review, we discuss theories regarding what affects the labour market and how the labour market could be affected by the Covid-19 crisis. Theories such as the Mundell-Fleming, AS-AD framework and Okun's law is discussed.

In the third section of the thesis, we discuss the labour market for the 13 OECD countries that we have chosen. We run a regression with unemployment as the dependent variable. We then discuss the result in greater detail.

In the fourth section, we describe the pre-covid-19 labour market in Sweden and what different institutions and policies exist. We also describe the pre-Covid-19 unemployment trends.

In the fifth section, we explain how the covid-19 pandemic affects the Swedish economy and labour market. We describe which policies were made to stop the spread and which policies were implemented to dampen the impact on the labour market.

In the sixth section, we run our event study tests to test how the Swedish labour market has been affected since the Covid-19 pandemic. We also explain the obtained results. We discuss different external factors that are not considered in our result.

In the seventh and last section, we conclude the thesis and write our final thought and what the reader should take with them from the study that we have conducted.

2. Literature review & theoretical discussion

2.1 Literature by theme

In the literature review, we review research in three parts. In the first part, we review research regarding which institutions and policies affect the labour market and unemployment. In the second part, we review research regarding an earlier crisis (2008 financial crisis) and how unemployment policies affected the unemployment rate during this period. In the third and final part, we discuss the effects on unemployment and the labour market during the Covid-19 crisis.

Part 1

Unemployment benefits

Unemployment benefits are a widely used labour market policy intended to reduce the financial pressure on unemployed people.

The methods used in the research we look at often consists of some version of a regression analysis. One study looked at the effects of unemployment insurance on different variables where unemployment duration was one of them. A dummy for when a participant had received unemployment insurance was implemented. The effect of the insurance was then seen in the difference in unemployment duration between recipients and non-recipients (Katz and Meyer, 1990). Another study looked at the matching quality between employee and employer. The test was conducted by first looking at the difference between the employee's skill level and the skill needed for the job. To estimate the difference in skill, the test estimated wherein the distribution the employee's skill was at and compared it to where in the distribution the skill needed for the job were at. The study then looked at the difference in the skill level between areas that had received benefits and areas that had not (Farooq *et al.*, 2020).

The results given by the studies concluded a variety of things. One of the studies concluded that higher unemployment benefits and duration of these benefits were positively correlated with increased unemployment duration (Katz and Meyer, 1990). Another study concluded that increased unemployment insurance was positively correlated with better job match quality. The better job matching quality was in turn positively correlated with higher wages (Farooq *et al.*, 2020). A conclusion regarding consumption was also made. It was concluded that unemployment insurance was positively correlated with consumption for unemployed people. The unemployed did not have to spend their assets when unemployment insurance existed (Moffitt, 2014).

Trade unions

Collective bargaining and trade unions are often believed to cause increased unemployment, especially during recessions. It is believed that due to wage rigidity (inflexible wages) the unemployment rises relatively more during recessions. Wages stay the same while companies have it worse making the money spent on labour less, hence increased unemployment (Burda and Wyplosz, 2017). The research that we are discussing is testing whether this concept has empirical support or not.

One study tested the effects of unions on unemployment and wages. The degree of unionization and the outcome of unemployment and wages were analysed. Whether there was a significant difference in the outcome of the variables between levels of unionization was tested (Chang and Hung, 2016). Another study tested the relationship between different levels of wage bargaining and movement in the real wage. The study was done using data for Germany. They tested to see if there was a difference in the real wage between companies that had different levels of wage bargaining. Bargaining could occur on the individual, selectorial or firm level. If there was a difference, they would conclude that wages become less flexible when collective bargaining is present. Less flexible wages would then be a reason why unemployment exists and increases more than it should during recessions (Gartner *et al.*, 2010).

The first study suggests that increasing the influence of unions on the labour market decreases employment. It also suggests that the number of hours worked per employee does increase (Chang and Hung, 2016). The other study concluded that there was a change in the wage

growth only when the bargaining was done collectively. Individual bargaining did not affect wage growth. This result suggests that inflexibility in wages does occur when collective bargaining is present. The result regarding the cyclical aspects of wage change was not as pronounced. Though, labour market institutions do influence wage through business cycles (Gartner *et al.*, 2010).

Part 2

We discussed unemployment insurance/benefits earlier. In this part, we discuss research regarding unemployment benefits during crisis time. More specifically, during the 2008 financial crisis. Knowing the difference of the impact of policies when there is a crisis or not is important for the handling of the labour market during crisis times.

The methods used in the research regarding the effects of unemployment benefits during a crisis mainly consists of regressions and event studies. One study used data from different counties in the US. The different counties had different unemployment insurance policies during the 2008 crisis. A regression was estimated with the employment to population ratio as the dependent variable. The test was performed to test what effect unemployment insurance had on employment during the 2008 crisis (Boone *et al.*, 2016). Another study tested state-level data and how the aggregate demand and supply of labour changed in states with different levels and durations of benefits. The study used an event study where the event consisted of an increase in potential unemployment benefits. How the number of job applications and vacancies changed due to this event was then tested (Marinescu, 2015).

The results from the research we looked at suggests mostly positive externalities of unemployment insurance during the recession. The first study concluded that an increase in unemployment benefits did not have any effect on the employment to population ratio that was significant. The job growth was not significantly affected either by increasing the duration of unemployment insurance (Boone *et al.*, 2016). The second study concluded that extending the duration of unemployment insurance did not have an impact that was significant on the labour demand. The insignificant impact on labour demand could be seen through the number of vacancies that stayed relatively the same when the duration of unemployment insurance was increased. The number of applicants did however see a decrease when the duration of benefits was increased. As a consequence, an application was

more likely to result in a job. The negative externalities of benefits were not as great as the positive impact on benefits recipients (Marinescu, 2015).

Part 3

In this part, we are discussing research relating to the Covid-19 crisis and the labour market. The research we review is focused on job search (supply and demand for labour) and the change in employment and economic activity during Covid-19 from containment policies. Wage-group-specific change in the labour market during Covid-19 is also in the research that we review. The research mostly regards Sweden, but other countries are also in the studies.

The first study researched the tightness of the labour market during Covid-19. Data for vacancies and applications in Sweden were used. The method consisted of comparing job searches and vacancies pre-Covid-19 to jobs searches and vacancies during the Covid-19 crisis (Hensvik *et al.*, 2021). Another study tested the effects of containment policies on the economy and employment in Sweden during the Covid-19 crisis. To test whether containment policies had affected the labour market, a regression analysis was used with a particular variable as the dependent one and several containment policies as explanatory. The containment policies contained data regarding several factors some of which were stringency of policies, testing and income aid (Bricco *et al.*, 2020). A third study researched the difference in employment impact in different groups. Groups contain people who have different wage levels. The method used to check the difference in the labour market between these groups was mostly a descriptive one. Groups were classified into different sections depending on the essentiality and flexibility to work from home. Groups whose ability to work during the Covid-19 crisis was lower, were deemed to have been hit harder during the crisis (Fana *et al.*, 2020).

The first study concluded that both applications and new vacancy posts had decreased after the first 3 months of the pandemic. The drop in new vacancy posts was greater than the decrease in new applications, implying increased tightness in the labour market. There had also been a redirection of applications to industries that were not hit as severely (Hensvik *et al.*, 2021). The second study concluded that economic activity decreased initially but not as much as in Sweden's Nordic peers. In the second quarter of 2020, the drop in economic activity was substantially larger which is most likely due to international aggregate demand

for goods decreasing. Mobility indicators that both measured visits to workplaces and retail stores were negatively correlated with containment policies. Containment policies were also negatively correlated with economic activity. Fewer visits to the workplace could be interpreted as less employment (Bricco *et al.*, 2020). The third study concluded that groups who were relatively lower-paid and more marginalised in society were more likely to be closed and were less likely to be teleworkable. The low-paid workers were hit harder with regards to employment during the pandemic than high-paid workers (Fana *et al.*, 2020).

Thoughts on earlier research

Most of the earlier research agrees and complement each other. There are however some exceptions. The results of the impact on job searches and vacancies seem to be different during the financial crisis and the Covid-19 crisis. The drop in vacancies was larger than the drop in applications during the Covid-19 crisis. This was not the case during the 2008 crisis. Another disagreement considers job matching and the duration of unemployment benefits. Some research suggests positive job matching quality from increased unemployment benefit duration (Farooq *et al.*, 2020) while others suggest there is no evidence of this (Moffitt, 2014).

The methods mostly used were event studies and regression analyses. Event studies are good for illustrating and testing the effect on a particular variable from a particular event. The downside of using an event study is that there is little information about the effects in the economy that led to the change in the variable. We only get information about how the variable changed from that event. Regression analysis is a good way to measure the correlation between different variables. Whether they are correlated or if they are correlated to the same third variable is not known. There might be a third variable that affects both variables but since that third variable is not in the model, this cannot be known. Which one of the variables that caused the other to change is not always clear from a regression analysis.

The difference between our thesis and earlier research is that we use the information and methods in earlier research to get a more nuanced and complete picture of labour market mechanics and the effects of Covid-19 on the labour market. We use different data and through different periods. The methods we used are similar but the data and specifications of the models are different. We built on top of earlier research by estimating our result and

complementing the result with information already available. Earlier research has more specific or other focuses regarding the economy and the labour market than the one in our thesis.

2.2 Theoretical discussion

We have reviewed earlier research and empirical evidence. In this section, we look at macroeconomic theories and what they imply about the labour market. The theories we use originates from Michael Burda and Charles Wyplosz book where they present a collection of established macroeconomic theories (Burda and Wyplosz, 2017). We go through the theory part of this thesis in three steps. In the first step, we look at how the labour market acts and which agents and factors on the labour market affect unemployment. In the second step, we discuss the different types of unemployment that exist. We also discuss what affects the different types of unemployment and how they occur. In the third step, we look at the short-term effects of the corona crisis on the Swedish economy. How these short-term economic effects are linked to unemployment in Sweden is also discussed.

Labour market

We start by discussing the supply and demand of labour. We then move on to discuss how unemployment benefits affect the supply of labour and the effects of trade unions and collective bargaining on the labour market.

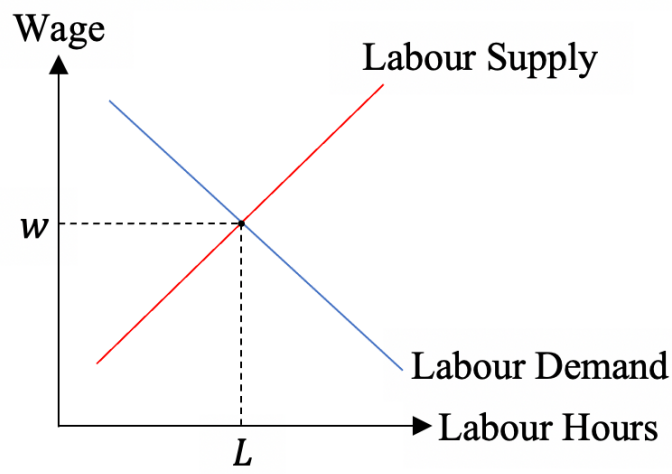

Chart 1, Labour market

Two factors affect the supply of labour, wage and working hours. As depicted in Chart 1, when employees get more compensation (higher wage) they are more incentivised to work for longer hours. When employees get lower compensation (lower wage) they are incentivised to work less. A person who does not work spends time having leisure, something people want to

have. The cost of not working one more hour is less consumption. The person chooses between more consumption and more leisure. We find our equilibrium when the compensation of working one more hour is less than the utility gained from one more hour of leisure.

The demand for labour acts oppositely. When the compensation (wage) is higher, the company can purchase fewer labour hours for their money. When the compensation (wage) is lower, they can purchase more labour hours. The company stops purchasing labour when one more hour of work gives the company less utility than the cost of that hour of labour.

The supply of labour displays a positive relationship between labour hours and wage. The demand for labour displays a negative relationship between labour hours and wage. The equilibrium on the labour market is where the demand and the supply of labour meets, which is depicted in the intersection of the two curves in chart 1. A particular amount of labour for a particular amount of compensation (wage) exists in the equilibrium.

The labour market changes slightly when unemployment benefits exist. The relative cost of having one more hour of leisure instead of working becomes less when zero hours of labour still gives some compensation. The person can still have some consumption while working zero hours with unemployment benefits. For that individual to choose to work, the compensation must be higher than for an individual with no unemployment benefits. Compensation for no work disincentives people to work. This ultimately decreases the supply of labour for every given wage level. Wage needs to be relatively higher in a country where unemployment benefits exist than in a country without unemployment benefits. The amount of labour being used and employed is then relatively less in the country with unemployment benefits. The equilibrium in the labour market occurs at a lower level of total labour employed.

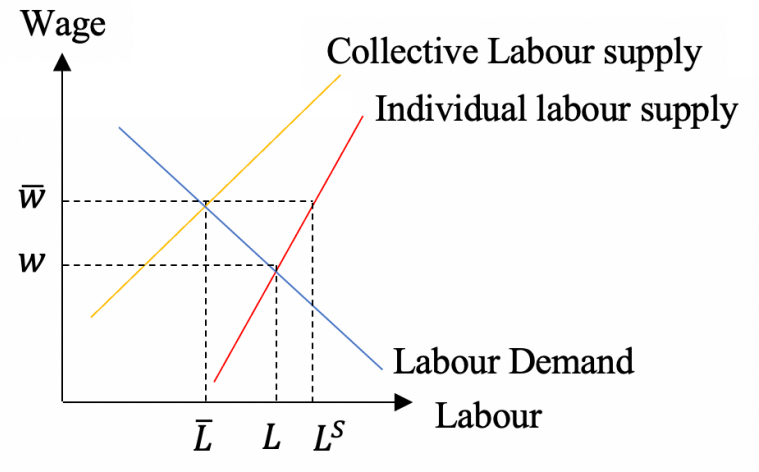

Chart 2, Labour market with unions

The labour market also changes when trade unions exist, as depicted in chart 2. Trade unions represent the workers and negotiate with employers and employer's organizations regarding wage and other work-related issues. Trade unions almost exclusively bargaining for the people who have a job and are members of a trade union. The unemployed people are often not represented in this bargaining process. The people who already have a job want higher compensation for their work, hence they bargain for higher wages. The companies can purchase less labour when wages are relatively higher. Some people are therefore unemployed because it is too expensive for the companies to hire them. The unemployed would probably want the wage on the labour market to be lower but this does not occur since the unemployed are not represented at the bargaining table. The labour supply curve with unions is at a higher wage level for every single amount of labour than the supply curve without trade unions. This can be seen in chart 2 where the collective labour supply curve is always higher up than the individual labour supply curve. This creates involuntary unemployment in countries where trade unions exist and have bargaining power. Involuntary unemployment is depicted as the difference between $\bar{L}$ and L^S in chart 2. $\bar{L}$ depicts the actual amount of labour employed for that level of wage while L^S depicts the amount of labour that would want to work for that level of wage. The equilibrium in the labour market with trade unions occurs at a lower level of total labour employed.

Another thing to consider when discussing trade unions in the labour market is wage flexibility. When trade unions are active, the power of employers becomes relatively less. Employers cannot change their employee's wages or lay people off at the same rate with unions active. This slows the employment process down and makes the wages relatively less flexible.

We have discussed the basics of the labour market and how different factors affect the equilibrium in the labour market. How the amount of labour employed is decided has also been disused. In the following section, we discuss different types of unemployment and how they occur. What types of unemployment might come from the Covid-19 crisis is also discussed in the following section.

Types of unemployment

Unemployment is divided into two parts. Cyclical and non-cyclical (equilibrium) unemployment.

Cyclical unemployment occurs during business cycles. When a country experiences a bust, the companies within that country has relatively less money which means that they have relatively less money to spend on labour relative to normal times. The companies can buy relative less labour because the wages are negotiated in advance. That is, the cost of labour stays the same while the money spent on labour decreases, creating unemployment. When a country experiences a boom, the same mechanism is at work. Though, instead of seeing an increase in unemployment, the country experiences a decrease.

Non-cyclical unemployment is called equilibrium unemployment. It is the unemployment present when we are neither in a bust or a boom. The equilibrium unemployment is made up of two categories, frictional and structural unemployment. Frictional unemployment occurs when there is a transitional period from one job to another. There will always be frictional unemployment since the time it takes to apply for a job until you get employed is greater than zero. Structural unemployment is caused by the wage level not being at the market level. The wage level that is present is not the one that would occur in market equilibrium. This could be due to market regulations and institutions. Trade unions are an institution that could create structural unemployment.

The equilibrium unemployment stays the same through business cycles. If the cycles are too great, that is, if a bust is too deep, the equilibrium unemployment could increase.

Sweden has experienced a bust during the Covid-19 crisis (Ekonomifakta, 2021a). This would indicate that an increase in cyclical unemployment has occurred during the crisis. The

equilibrium unemployment could also increase if the recession occurs during too long of a period.

Covid-19 effect in Sweden

We have discussed different types of unemployment and how they occur. We concluded that a bust would increase cyclical unemployment. In the following section, we look at how the Covid-19 crisis could create a bust and extend the discussion regarding economic shocks and unemployment. The following theoretical analysis is specific to the Swedish economy (or countries with the same economic structure as Sweden).

To illustrate the changes in the economy and unemployment we use three different models and frameworks. We begin by analysing the effects of Covid-19 on the Mundell-Fleming framework. The Mundell-Fleming model gives information regarding whether an aggregate demand shock has occurred or not. We then complement the result of the Mundell-Fleming model by analysing the change in the AS-AD framework. The AS-AD framework gives us the short-term effects on inflation and whether we are in a bust or a boom. A bust will be represented by a negative output gap and a boom will be represented by a positive output gap. An output gap occurs when GDP is higher or lower than potential GDP. Potential GDP represents the non-cyclical value of all products and services produced in the country. We use Okun's law to illustrate the relationship between the output gap and unemployment.

Mundell-Fleming, IS-TR

Sweden is a small open economy. This implies that changes to the domestic interest rate do not impact the global interest rate. Sweden is also affected by non-domestic shocks and changes. Sweden has a flexible exchange rate. This implies that monetary policy is effective and is used to steer the Swedish economy.

The Mundell-Fleming framework can be used to analyse small open economies and is made up of three different curves as depicted in chart 3. The IS curve, The TR curve and the IFM-curve. The IS curve describes the negative relationship between interest rate and output. A lower interest rate stimulates investment spending, hence increasing output. The TR curve

describes the central bank's policy regarding output and interest rate. If the output is high, the central bank increases the interest rate. This is done to smoothen out business cycles. The IFM curve illustrates the international interest rate. The domestic interest rate must be the same as the international interest rate in the long run. Capital in and outflows occurs if the domestic interest rate is not equal to the international. These flows then adjust the domestic interest rate to be the same as the international one again.

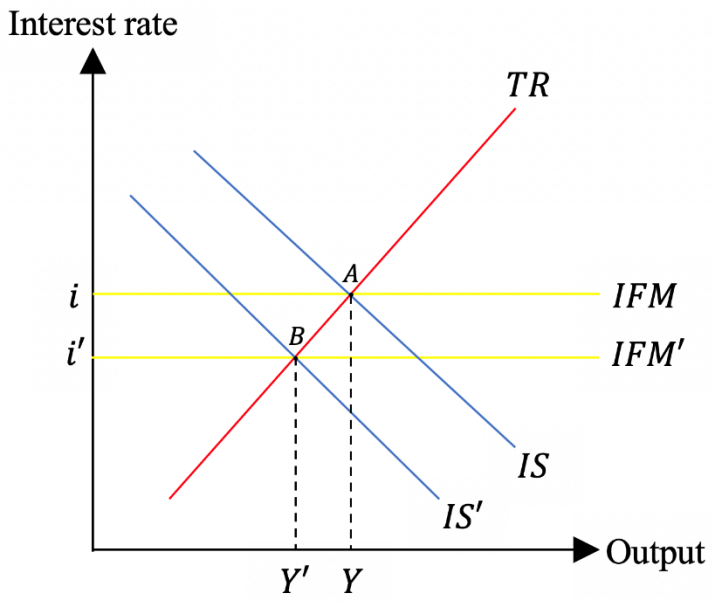

Chart 2, IS-TR

We start at point A of chart 3. We assume that the Covid-19 crisis increased the uncertainty of people. People consume less and save more. People also invest less due to this uncertainty. To incentivise investment, global economists decide to lower the interest rate (OECD, 2021c). A lower interest rate makes it relatively less expensive to borrow and relatively less favourable to save. This change in the global interest rate is illustrated by a change in the IFM curve. IFM moves to IFM'. The domestic interest rate is now higher than the international. This creates an incentive to borrow money abroad and to save in Sweden. This increases the demand for the Swedish currency. Higher demand for Swedish currency appreciates the currency. The appreciation makes it relatively more expensive to purchase Swedish goods. The demand for Swedish goods declines. This shifts the IS curve to IS'. We end up in the new equilibrium (point B) with a lower aggregate demand in the Swedish economy.

AS-AD

We have shown an example of how the aggregate demand for Sweden has declined during the Covid-19 crisis. There has also been a change in the aggregate supply in the economy. Sweden has implemented restrictions to contain the Covid-19 virus that decreased the number of workers and customers being present at the workplace (Folkhälsomyndigheten, 2020)

(Folkhälsomyndigheten, 2021). Fewer people being at the workplace to produce goods and services creates and less availability to purchase these goods and services creates a negative aggregate supply of goods shock to the economy.

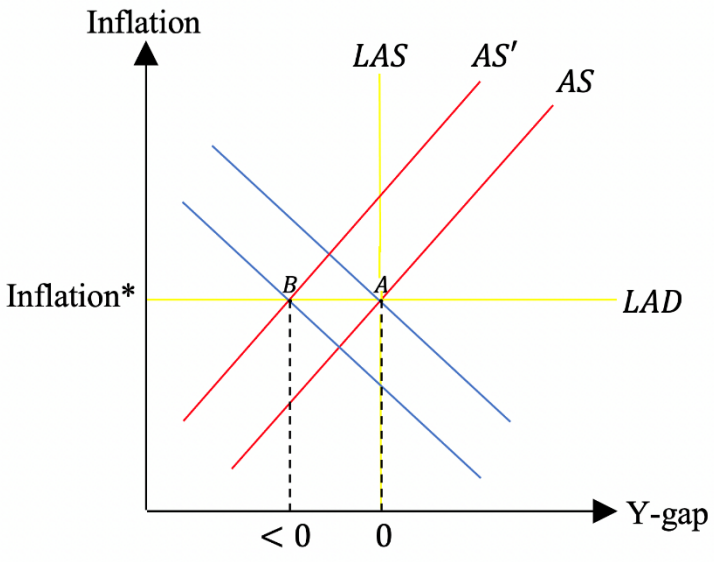

Chart 3, AS-AD

To analyse the effects of the negative aggregate demand and aggregate supply shock, we use the AS-AD framework as depicted in chart 4. The x-axis represents the output gap. The output gap is the distance from actual GDP to potential GDP. We are at potential GDP when we are at the LAS curve (the long-run aggregate supply curve). The y-axis represents inflation. The LAD curve depicts the long-run aggregate demand. Both the aggregate demand and the aggregate supply meet at the intersection of the LAS curve and the LAD curve in the long run. This point is the equilibrium. We assume that we start in equilibrium (point A in chart 4) before the Covid-19 crisis.

We experience a negative aggregate demand shock when the demand for goods and services decreases. This would normally give us a negative output gap since companies do not produce as many goods and services due to the lower demand. Normally, with only a negative aggregate demand shock occurring, we would also see less inflation. This is due to companies having to keep lower prices to get their products sold, lowering down the rate at which prices increase.

We experience a negative aggregate supply shock when workers are not able to go to their job at the same rate. If only a negative aggregate supply shock occurs, we would experience a negative output gap. This is due to fewer goods and services being produced than what would normally occur. Fewer good and services but with an unchanged demand for them would increase the price for each one of the goods and services. This would then create inflation. Contrary to only having a negative aggregate demand shock and no aggregate supply shock.

We have concluded that both a negative aggregate demand and supply shock has hit the economy. We assume that both shocks are of the same degree (unlikely but is done for illustrative purposes). This implies that inflation does not change. We will however see a large negative output gap. The effect of the Covid-19 crisis has created a large negative output gap in the Swedish economy. The large negative output gap indicates a recession (or a bust). This effect can be seen by the economy being located at point B in chart 4. Note that these are the effects on the economy in the short run.

Okun's Law

We have concluded through the AS-AD framework that we have experienced a large negative output gap during the Covid-19 crisis. We use Okun's law to analyse the impact of the negative output gap on unemployment.

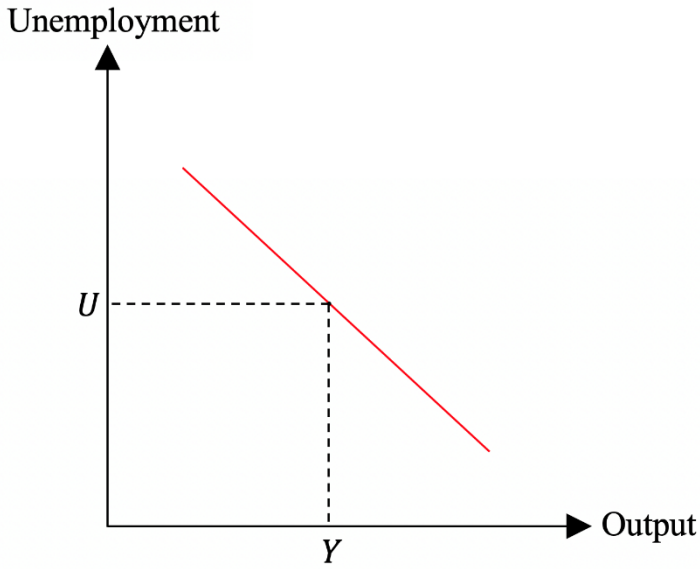

Chart 4, Okun's Law

Okun's law links the relationship between unemployment and the output gap as shown in chart 5. When the output gap is positive the economy grows fast. When the economy grows fast more labour is needed. This implies that a positive output gap relates to more labour being employed hence less unemployment. The same mechanism but with the opposite effect is active when a negative output gap is present. We conclude that the negative output gap given by the AS-AD model implies higher unemployment. The unemployment rate in the economy should have increased during the Covid-19 crisis.

To summarize the theory part. We have gone through the labour market and how the wage is decided in equilibrium. We have discussed how both trade unions and unemployment benefits negatively impact the amount of labour hired. Though, through different mechanisms. We

discussed different types of unemployment and what affects them. We have also discussed how the Covid-19 crisis has affected the economy and unemployment. We concluded that a recession (or a bust) has occurred during the Covid-19 crisis and that this has increased unemployment.

3. Empirical analysis of global labour markets

We have gone through what the theories indicate about the labour market and the economy. In this section, we analyse and discuss empirical data. We analyse different factors relating to the labour market to see their correlation to unemployment. By estimating the relationship between certain factors and unemployment we can then proceed to discuss the consequences of policies and institutions on unemployment.

We analyse the period 2001-2015. We use annual data regarding 13 OECD countries, which is specified in table 1, in the analysis. The number of data cells used in the analysis is 195 (15 years times 13 countries).

Countries:	Austria	Belgium	Denmark	Finland	France	Germany
Italy	Netherlands	Norway	Spain	Sweden	United Kingdom	United States

Table 1 Countries in regression

The reason we use these countries is to see what impact variation in the explanatory variables has on unemployment. Certain variables are close to constant over time. Analysing several countries with similar economic situations but with different policies and institutions, broadens the analysis. As all the countries have similar economic situations, an analysis with specific countries in the regression with the results can be had. We can therefore take the results of the empirical study and apply them to the discussion of the Swedish labour market later in the thesis. The point of this analysis is to see which effects certain factors are associated with on the labour market in normal times before the Covid-19 crisis. A discussion will be had with regards to the Covid-19 crisis later, although the results of this particular section apply to non Covid-19 times.

3.1 Method/data

The methodology in this section is regression analysis. The regression methodology has been derived from the book “Introduction to Econometrics” by Christopher Dougherty, 5:th edition (Christopher Dougherty, 2016). Regression analysis is done to estimate the relationship between certain variables and one particular variable. The particular variable in our case is the

unemployment rate. By using data for several variables, we estimate the outcome of the particular variable. The several variables are often called the explanatory and the particular is called the dependent. We use panel data to do our estimates. The panel data is data for several countries through a period. The regression estimates a linear equation with the best fit of the data. In the equation, the explanatory variables have a coefficient in front of them. The coefficient displays how much an increase of one unit in the explanatory variable changes the dependent one (unemployment). The test also shows whether the coefficient is significantly different from zero or not. This is represented by the null hypothesis. The null hypothesis is that the coefficient is equal to zero. If a coefficient is not different from zero, we cannot say anything about the relationship between that variable and unemployment. To reject the null hypothesis, we look at the p-value. If the p-value is lower than a particular value, we reject the null hypothesis. A rejection indicates that the coefficient is significantly different from zero and the explanatory variable is associated with unemployment. The particular value is called alfa (α). The lower the alfa, the higher the strength of the test. We put alfa = 0.1, 0.05 and 0.01 in our regression and we discuss the different levels of significance and what they imply for the result.

The model is specified using a one-way error component model. We assume that there is an individual-specific effect apparent in the model. The individual, in this case, is the different countries. By using the error component, we divert effects that are due to that particular country, away from the variables in the model. If we were to not do this, the result in our regression could display incorrect values. We also assume that the country-specific effects are fixed. By assuming that the effects are fixed we assume that the country-specific effects are constant through time for that specific country. We perform a test later in the thesis to test this assumption regarding whether the effects being fixed is true or not. We also assume that unemployment is affected by different periods being present. We call this effect a time-specific effect. We estimate the time-specific effect by including a variable for GDP per capita for 37 OECD countries. Effects that are specific to a particular period is then diverted to the GDP per capita for these 37 OECD countries. Time-specific effects are often seen in the development of GDP, bust equals lower growth in GDP and a boom equals higher growth in GDP.

In the next section, we discuss the data and variables used in the analysis. We also hypothesise the relationship between the explanatory variables and the unemployment rate (dependent variable).

As been earlier mentioned, the unemployment rate has been chosen as the dependent variable in the regression analysis. The unemployment rate is a widely used indicator. The unemployment rate displays the percentage of the labour force that are involuntarily unemployed. The labour force consists of people who are of working age and want to work. The definition may vary from country to country.

The following are the explanatory variables we use in the regression: unemployment benefits as a share of previous income, trade union density, GDP, inflation, public unemployment spending and GDP per capita for 37 OECD countries. Data and sources for the variables are depicted in table 10, in appendix A.

Unemployment benefits: the data for unemployment benefits we use in our regression is unemployment benefits as a share of previous income after two months of unemployment. The data regards short term unemployment benefits. The data comes in percentage form. We hypothesise that an increase in unemployment benefits disincentives unemployed people to search for jobs, increasing the duration of unemployment (Katz and Meyer, 1990).

Trade union density: the data regarding trade union density we use in our regression is the percentage of wage and salary earners that are members of a trade union. We hypothesise that increased trade union density increases the unemployment rate. Higher trade union density increases the influence of trade unions and further inflate real wages. The collective labour supply with higher trade union density suggests a higher wage than the non-trade union labour supply curve. The increased cost of labour results in higher unemployment (Burda and Wyplosz, 2017).

GDP: the data regarding GDP we use in our regression is nominal GDP in millions of USD. We hypothesise that increased GDP leads to a decrease in unemployment. Higher GDP increases the value of all goods and services in the country. This could be interpreted as more goods and services being produced which needs more workers to produce these goods and services. Higher growth in GDP is often correlated with a boom which we hypothesise is negatively correlated with unemployment (Burda and Wyplosz, 2017).

Inflation: the data regarding inflation that we use in our regression is based on the consumer price index (CPI). The consumer price index calculates the price variation for a specific collection of goods (OECD, 2021d). We hypothesise that increased inflation will be negatively correlated with the unemployment rate. Wages are negotiated in advance. When inflation is higher than expected, the real wages get lower. Lower real wage makes labour relatively cheaper. Cheaper labour increases the amount of labour hired hence decreased unemployment. Inflation is also positively correlated with a boom which in turn is negatively correlated with the unemployment rate (Burda and Wyplosz, 2017).

Public unemployment spending: the data regarding public unemployment spending we use in our regression is the money spend on unemployed people as a percentage of GDP. We hypothesise that increased spending on unemployed people will increase the unemployment rate. Higher compensation for unemployed people disincentives people to search for jobs. People who revive compensation while being unemployed do not have to search for a job to satisfy any financial needs (Moffitt, 2014). They can look for a job for a longer duration which increases the duration of unemployment. Increased duration leads to the overall rate also increasing.

U = Unemployment rate, UB = Unemployment benefits, TD = Trade union density, GDP = Gross Domestic Product, CPI = Inflation, PUS = Public unemployment spending, OECD = GDP per capita for the whole OECD (time specific effect).

$$U_{i,t} = \beta_1 + \alpha_i + \beta_2 UB_{i,t} + \beta_3 TD_{i,t} + \beta_4 GDP_{i,t} + \beta_5 CPI_{i,t} + \beta_6 PUS_{i,t} + \beta_7 OECD_t + \mu_{i,t}$$

$$\mathrm{H}_0: \beta_j = 0$$

$$\mathrm{H}_a: \beta_j \neq 0$$

$$j = 1, \ldots, 7$$

β = Coefficient

The equation above is the estimated model for our regression.

The time-specific effect is estimated by the OECD variable. We do not discuss the coefficient for the OECD variable since the variable is only supposed to act as a dummy and to divert any time-specific effect away from the other variables.

The country-specific effect diverted through the α_i in the error component model. Any effect specific to a particular country is displayed in the α_i-value.

We show the result of our regression that we specified in the equation above in the next section. We start by discussing whether the variables have a coefficient that is significantly different from zero. We then go through one variable at a time and discuss how these variables are related to unemployment and why they have the relationship with unemployment that they have.

3.2 Result/discussion

Variable	Coefficient	Std. Error	p-value	
UB	-0,14	0,03	0,0000	***
TD	0,16	0,09	0,0593	*
GDP	-0,0000003	0,0000002	0,0927	*
CPI	-0,28	0,10	0,0098	***
PUS	5,60	0,44	0,0000	***

Table 2 Regression result

$R^2 = 0{,}87$

U = Unemployment rate, UB = Unemployment benefits, TD = Trade union density, GDP = Gross Domestic Product, CPI = Inflation, PUS = Public unemployment spending

Significance at α = 0,1 level = *, Significance at α = 0,05 level = **, Significance at α = 0,01 level = ***

All the variables we used in our regression are significantly different from zero at the 0,1 level as can be seen from table 2. Unemployment benefits, inflation and public unemployment spending are also statistically significantly different from zero at the 0,01 level. We can with greater certainty say that these three variables are significantly different from zero. Rejecting the null at a lower α decreases the probability of making a type I error. A type I error occurs when rejecting a null hypothesis that in reality is true. The lower the p-value, the lower the risk of concluding that a variable is significantly different from zero when in fact it is not

(Christopher Dougherty, 2016). We are more certain that our result is correct for the variables that pass the 0,01 significance level than the ones that only pass the 0,1 significance level.

Unemployment benefits: An increase in the unemployment benefits two months after being unemployed with one percent unit is correlated with a decrease of 0,14 percent units in unemployment.

From the regression, we can see that the short-term unemployment benefits that we used are negatively correlated with the unemployment rate. This could be due to the increased benefits increasing consumption when unemployed (Moffitt, 2014). Instead of consuming less, a person who gets unemployed consumes the same amount of goods and services. This would in turn affect the aggregate demand in the economy positively which in turn decreases unemployment (Burda and Wyplosz, 2017). We hypothesised the opposite effect of unemployment benefits. The unemployment benefits were hypothesised to be positively correlated with unemployment. The short-term nature of the data is likely what caused the result to differ from our hypothesis. If we were to use data regarding unemployment benefits for a longer duration, the result probably would have been different.

The impact of increased consumption on the economy is likely greater than the negative job search incentive that unemployment benefits have. Given the short-term benefits we use in the regression, it is likely that people who get unemployed stay unemployed for at least two months. The unemployment benefits would not affect the incentive of people who are unemployed during a short period.

Trade union density: An increase in trade union density by one percent unit is correlated with an increase in the unemployment rate by 0,16 percent units.

The regression gave us the result that trade union density is positively correlated with the unemployment rate. This matches our hypothesis that increased union influence drives up wages. The higher wages make labour relatively more expensive which in turn would decrease employment. Decreased employment equals increased unemployment.

Trade unions density might indicate less flexibility and power for the employer to lay people off or to fire people. Employers must then think twice before hiring people, making it harder to secure a job. Though, less flexibility might also decrease the risk of a person who already

has a job getting unemployed. This is positive for people who are employed and negative for unemployed people.

Our result is in agreement with earlier research that suggested that trade unions were positively correlated with less employment (Chang and Hung, 2016).

Gross domestic product: An increase in the GDP by one million USD is correlated with a decrease in the unemployment rate by 0,0000003 percent units. An increase in the GDP of one trillion USD is correlated with a decrease in unemployment by 0,3 percent units.

The regression results suggest a negative correlation between GDP and the unemployment rate. When GDP increases, the overall value of all goods and services produced increases. This could indicate that more goods and services are being produced. Higher GDP indicates that more workers are needed to produce these goods and services, hence less unemployment.

Higher GDP indicates higher economic prosperity and more jobs opportunities, which is related to higher employment and less unemployment (Burda and Wyplosz, 2017).

If the GDP grows slower than the population, the job opportunities per capita might not grow, this could result in a positive correlation between GDP and unemployment. The regression does however not suggest this. The positive effect on job opportunities from increased GDP is likely greater than the growth of the population.

Inflation: An increase in the inflation rate by one percent unit is correlated with a decrease in the unemployment rate by 0,28 percent units.

The regression results suggest that inflation is negatively correlated with unemployment. This might be due to changes in the real wage. Wages are negotiated in advance. If the inflation is higher than expected, the real wage decreases. If real wage decreases, labour becomes relatively cheap. This would then increase employment and decrease unemployment.

The reason inflation is negatively correlated with unemployment could also be due to other factors. It might be due to a positive output gap (a boom) that often brings higher inflation. A positive output gap (a boom) decreases unemployment. The negative relationship between the

output gap and unemployment can be seen through Okun's law, a theoretical concept we discussed earlier in the thesis (Burda and Wyplosz, 2017).

Too high inflation would probably cause a crisis. Hyperinflation would probably put a country into a crisis which would then increase unemployment.

Public unemployment spending: An increase in the public spending on unemployment as a percentage of GDP with one percent unit is correlated with an increase in the unemployment rate by 5,6 percent units.

The regression suggests that public spending on unemployment is correlated with increased unemployment. The spending in this data considers a longer time perspective than our earlier variable for unemployment benefits. Public spending on unemployment disincentives people to get employed. People who get compensation while being unemployed does not have to get a job to satisfy financial needs (Moffitt, 2014). They can be picker while searching which would cause the duration of unemployment to increase.

If a person spends a long time searching for a job, it increases the likelihood of that job being better suited for that individual's skill level. The job matching process becomes better which is beneficial for both employees and employers (Farooq *et al.*, 2020).

Any extension of unemployment insurance during crisis times would probably not have any significant negative impact on unemployment. Extended unemployment insurance during the financial crisis of 2008 had little to no negative impact on the number of jobs created (Boone *et al.*, 2016). It did decrease the number of people who submitted applications, increasing the probability of getting that particular job (Marinescu, 2015). During crisis time, public unemployment spending might not have any negative impact on the unemployment rate. But it could positively affect the job matching process and consumption.

R-squared

The value of R-squared gives us the overall fit of the regression. R-squared can be any number between 0 and 1. The higher the value the better the explanatory variables are at estimating the dependent one (Christopher Dougherty, 2016). Our R-squared value equals about 0,87. The interpretation of this value is that the regression has a good fit, although there is room for improvement.

Hausman test

We perform a test called the Hausman test to test whether the model we estimated is correctly specified. The test tests whether the country-specific effect that we assumed is present, is random or not. We assume that it is not random but fixed. The null hypothesis for this test is that the country-specific effects are random. We chose α to be equal to 0,05 in our test. A p-value lower than the chosen α of 0,05 indicates that the country-specific effect is not random but fixed, which we assume.

Hausman test	Chi-Sq. Statistic	p-value	
	19,04	0,0041	***

Table 3 Hausman test

Significance at α = 0,1 level = *, Significance at α = 0,05 level = **, Significance at α = 0,01 level = ***

The p-value is lower than the α of 0,05 as indicated by table 3. The p-value is also lower than α = 0,01. This indicates that the country-specific effects are not random and that the model is correctly specified.

VIF

Other issues that might occur when performing a regression analysis is problems with multicollinearity. Multicollinearity occurs when there is a correlation among the explanatory variables. Multicollinearity can cause the result to be misleading or false. To test whether there is multicollinearity in the model we use a VIF test. VIF (Variance inflation factor) measures the degree to which the variables are intercorrelated. A low value would indicate lower intercorrelation. A VIF value of over 5 or 10 would indicate high intercorrelation and would suggest that there exists multicollinearity in the model (Bhandari, 2020).

Variable	VIF
UB	1,47
TD	3,01
GDP	1,42
CPI	1,19
PUS	1,46
OECD	3,19

Table 4 VIF test

U = Unemployment rate, UB = Unemployment benefits, TD = Trade union density, GDP = Gross Domestic Product, CPI = Inflation, PUS = Public unemployment spending, OECD = GDP per capita for the whole OECD (time specific effect).

None of the variables has a VIF-value of over 5 or 10 as indicated by table 4. We conclude that the intercorrelation between the variables is not high enough to cause issues with multicollinearity. The results in the model are not misleading or false.

Problems with causality in regression analysis: There might be some issues regarding causality in the model that we estimated. The data for public unemployment spending and the unemployment rate might impact one another. A high unemployment rate could make the government increase the spending on unemployment. They increase the spending to decrease unemployment. The regression would then interpret a positive relationship between these variables while they in reality have a negative relationship. The result from our model would suit this narrative. We do however believe that the result we have gotten is correct and that increased public spending on unemployment does indeed correlate with longer unemployment duration.

We have analysed the labour market for 13 OECD countries and how it functions. Which institutions and policies are correlated with unemployment have been discussed. We also discussed how these policies and institutions are correlated with the unemployment rate. We narrow our focus down to the Swedish labour market in the following parts of this thesis.

4. The Swedish labour market (Policies, institutions and unemployment)

In this section, we discuss the Swedish labour market in non-Covid-19 times and how it operates. We start by discussing which policies and institutions act on the labour market in Sweden. We then proceed to discuss the unemployment rate before Covid-19, which industries are the biggest employers, which industries make up the greatest percentage of Sweden's GDP and the wage distributions between occupations and industries.

4.1 Unemployment benefits

Unemployment benefits in Sweden are issued through unemployment insurance funds. The size of the unemployment benefits depends on how long a person has been a member and how much they have worked before being unemployed. There are two types of benefits, base compensation and income-based compensation (Arbetsförmedlingen, 2021).

To get the base compensation the following requirements needs to be fulfilled. During the last 12 months before being unemployed, one of two scenarios must have occurred. The person must have worked at least 80 hours a month for 6 months or the person must have worked at least 480 hours during 6 consecutive months with at least 50 hours each month. The base compensation gives compensation up to 8 030 SEK per month.

To be eligible for income-based compensation a person must have been a member of an unemployment insurance fund for at least 12 months before being unemployed. The income-based compensation gives compensation up to 300 days of unemployment. A person gets 80% of earlier income for the first 200 days. During the last 100 days, a person receives 70% of earlier income. A roof of 20 020 SEK per month exists for the first 100 days. After the first 100 days, the roof shrinks to 16 720 SEK per month. All amounts are before tax and for people who receive benefits regarding full-time work (Regeringen, 2021a).

To keep receiving unemployment benefits, the unemployed must perform various work-related activities. This is done to incentivise workers who are unemployed to look for jobs and

to actively make themselves more applicable to the labour market (Arbetsförmedlingen, 2021).

4.2 Trade unions

Trade unions in Sweden negotiate with employer's organisation regarding wage, semester, pension and other work-related matters. A collective agreement is signed once both parties have agreed on a particular matter. This agreement applies to all workers who work at a company that has negotiated with a trade union (Svenskt Näringsliv, 2021). The trade union that bargains with a company depends on the industry. Different industries have different trade unions that are active in that industry.

There are no legislative minimum wages on the Swedish labour market. The trade unions bargain about starting wages for new and young employees. These agreements are made through the collective bargaining process. A wage cannot be lower than the negotiated one even though there is no legislative minimum wage (Medlingsinstitutet, 2019).

Trade union membership has declined in Sweden steadily since the 1990s as depicted in chart 6. From the data we collected, we estimate that about 65% of wage or salary earners are members of a trade union. Even though only 65% are members, it is estimated that around 90 % of all employees are covered by collective bargaining (Medlingsinstitutet, 2021).

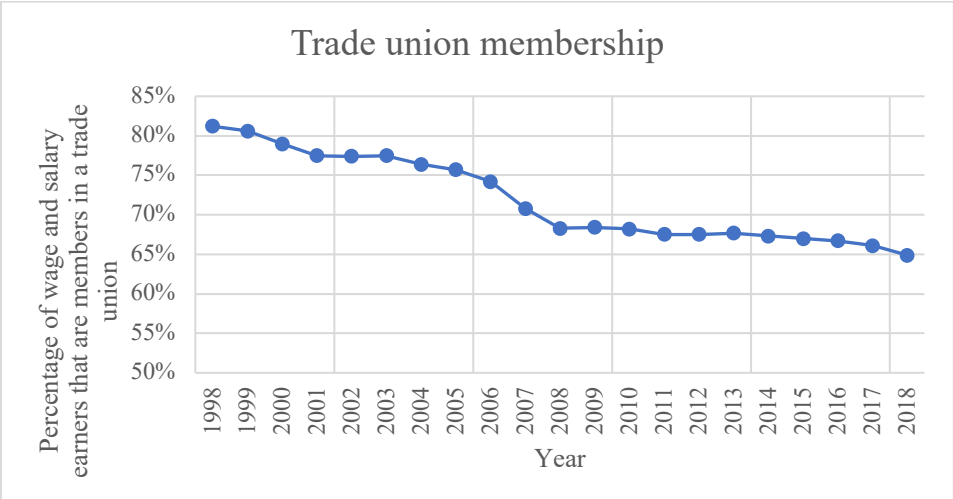

Chart 6 Trade union membership (density) in Sweden, 1998 – 2018

Source: (OECD, 2021f)

We have discussed the Swedish labour market and the different policies and institutions active in it. In the following section, we discuss unemployment and how different industries differ with regards to employment, the share of GDP and wage.

4.3 Unemployment rate

The unemployment rate in Sweden is calculated as the non-employed people who are a part of the labour force. People who are between 15 and 74 and who are willing to work counts as the labour force (Statistiska Centralbyrån, 2021a). During the 1990s the unemployment rate rose to a maximum of 10%. The unemployment rate decreased and stayed relatively low during the 2000s up until the global financial crisis in 2008 when the rate went up slightly again. Since the financial crisis, the unemployment rate has steadily decreased. In 2019 the unemployment rate was estimated to be equal to 6,8% as shown in chart 7.

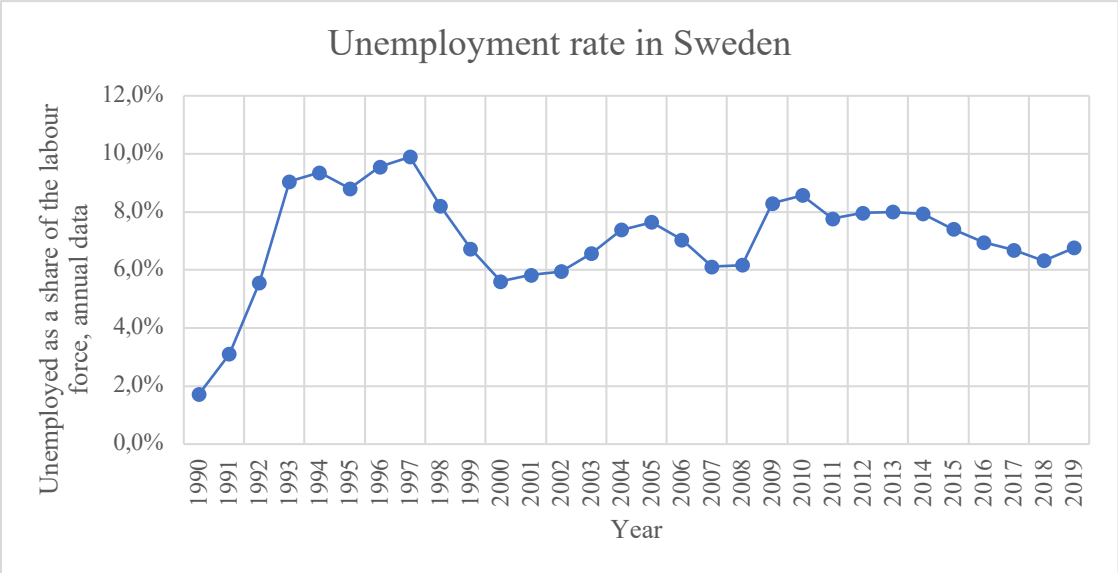

Chart 7 Unemployment rate in Sweden, 1990 – 2019

Source: (OECD, 2021g)

4.4 Share of employed by industry

The biggest employers in Sweden are financial activities and business services, health and social care, commerce, education and manufacturing and extraction, energy and the environment. 63% of all employed workers in Sweden work in one of these industries as depicted in chart 8. These numbers represent the labour market in 2019.

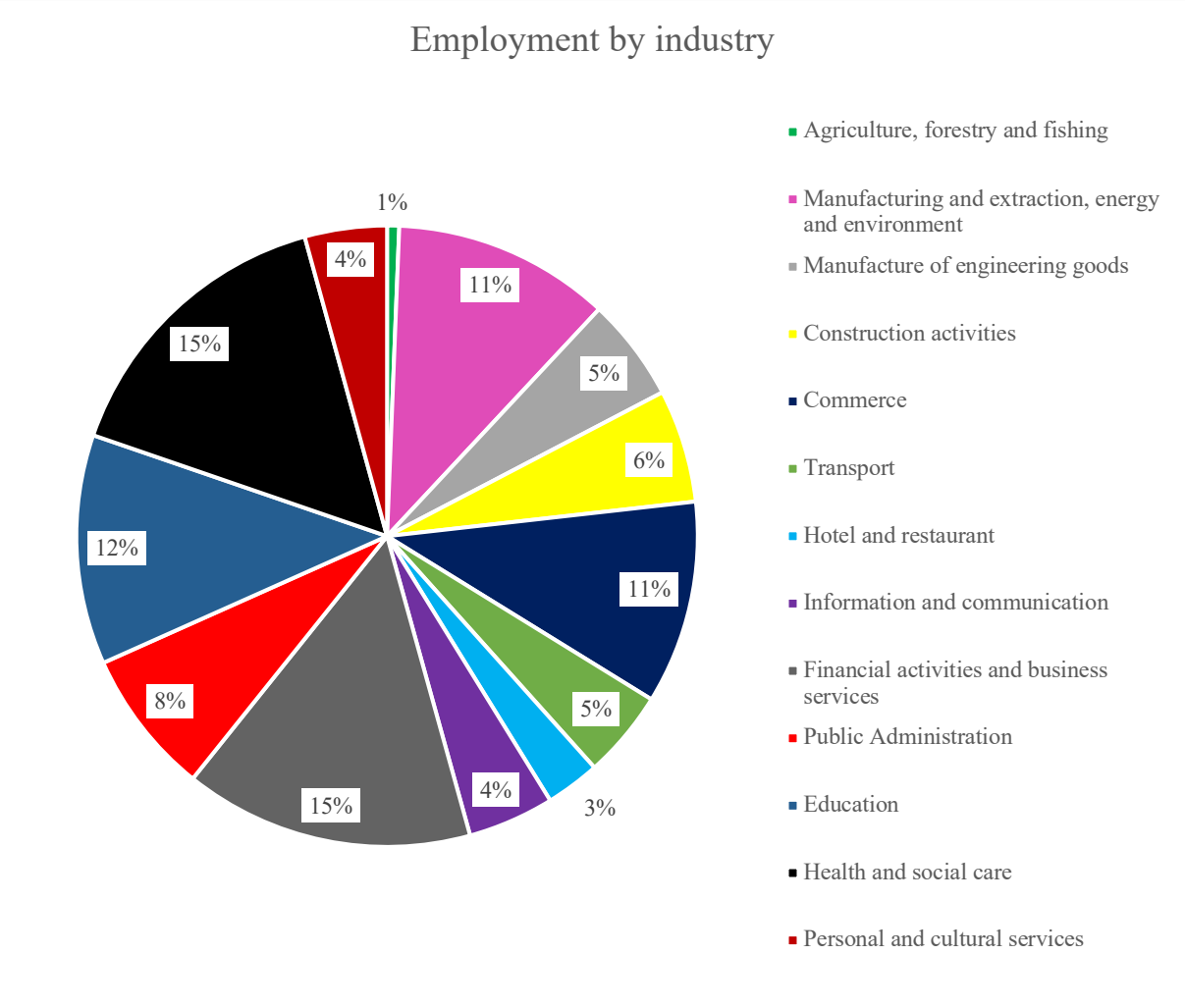

Chart 8 Share of total employed that are employed per industry in Sweden, 2019

Source: (Statistiska Centralbyrån, 2021e)

4.5 Industry to GDP

The biggest industries in Sweden are mining and manufacturing, municipal authorities, commerce and business services as depicted in table 5. Industries that are represented as other industries in the table make up 13% of the total GDP. Industries such as hotels and restaurants are represented in this category.

Industry	Share of total GDP
Mining and manufacturing	15%
Municipal authorities	14%
Other industries	13%
Commerce	10%
Business services	10%
Real estate activities	9%
Information and communication	8%
Construction activities	7%
Government agencies	6%
Transport	4%
Banking and insurance	4%
Total	100%

Table 5 The share of industries contribution of GDP in Sweden, 2019

Source: (Statistiska Centralbyrån, 2021d)

4.6 Wage distribution by occupation

Table 6 displays the highest and lowest paid occupation in Sweden in the year 2019.

The highest-paid workers are often in some sort of managerial position. Occupations within the industry of financial activities and business services are highly represented at the top of the wage distribution in Sweden.

The lowest-paid workers are often in some sort of assistant position. Occupations within the industries of commerce and hotels and restaurants are highly represented at the bottom of the wage distribution in Sweden.

Highest paid workers	
Occupation	Average salary
Managers in banking, finance and insurance level 1	143 300
Brokers in finance	102 600
General, county council and municipal directors	92 600
Specialist doctor	78 700
CEOs	78 300
Managers in banking, finance and insurance level 2	76 900
CFOs, level 1	75 600
Operations managers in construction, civil engineering and mining, level 1	74 500
Air traffic controller	73 800
Information, communication and PR managers, level 1	73 700

Lowest paid workers	
Occupation	Average salary
Taxi driver	24 300
Nanny	24 300
Event salesmen and shop demonstrators	24 300
Restaurant and kitchen assistants	24 200
Cleaners	24 200
Cashier	23 900
Service worker	23 000
Market researcher and interviewer	23 000
Café and pastry shop assistants	22 300
Home service staff	21 400

Table 6 Mean wages for different occupations in Sweden, 2019

Source: (Statistiska Centralbyrån, 2021b)

5. Covid-19 & labour market changes

We have discussed and explained the structure of the Swedish labour market before the Covid-19 crisis. In the following section, we briefly explain the Covid-19 crisis origin. We then discuss policies put in place to contain the virus and policies put in place to dampen the negative impact on the labour market.

5.1 Covid-19

The virus was first discovered in Wuhan, China. Reports regarding the virus came to the Chinese world health organisation office as early as December 31:st 2019 (World Health Organisation, 2020a).

Continuous international spread occurred and the first case in Sweden was reported on the 31:st of January 2020. The woman who had contracted the virus had come from Wuhan (Krisinformation, 2020).

The first death recorded in Sweden was on the 11:th of March 2020 (Sallinen, 2020). This was the same day that the world health organisation declared the spread of Covid-19 a pandemic (World Health Organisation, 2020b).

5.2 Containment policies

To fight the spread of Covid-19, several containment policies were implemented. Chart 9 measures the level of stringency on an index level. 0 equal to least stringent and 100 equals most stringent. Stringency initially peaked at around 65 during the beginning of April 2020. The increase occurred rapidly at the beginning of the crisis. The time from when stringency was equal to zero until the initial peak was reached occurred after about 30 days. During the summer and autumn of 2020, stringency decreased slightly. During winter 2020/2021 measures increased and we reached a new peak of stringency being equal to about 70. This level has been relatively stable through the winter and the spring of 2021.

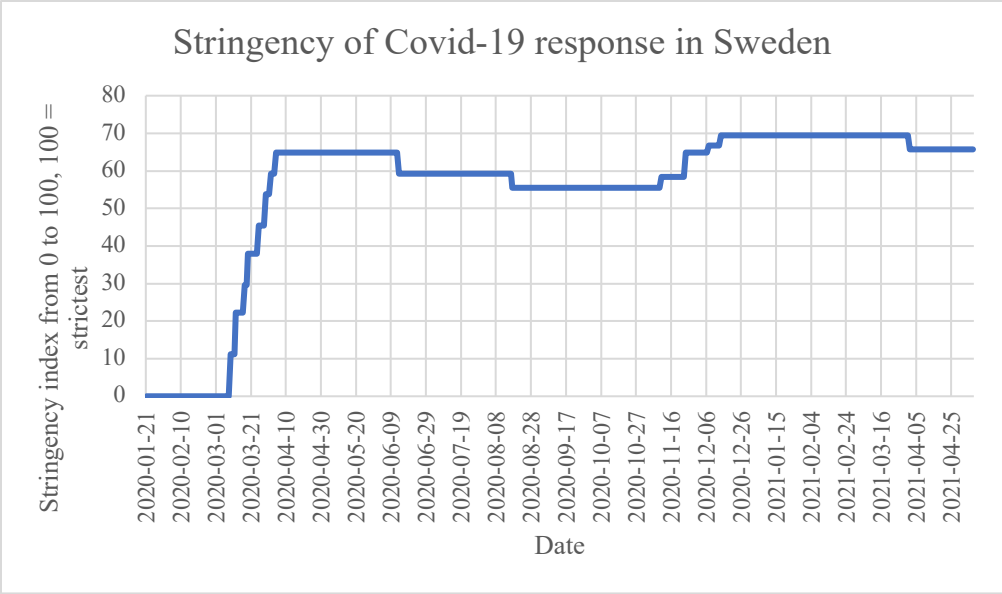

Chart 9 Stringency index of the Swedish containment policy, 2020-01-21 – 2021-05-07

Source: (Our World in Data, 2021)

The initial response to contain the spread of Covid-19 was recommendation based. The public health authority recommended that stores and malls should decrease the number of customers present in the facility at the same time. Recommendations regarding workers working from home were also implemented. The people who could work from home should do that and workers who cannot work from home should keep their distance from co-workers (Folkhälsomyndigheten, 2020). These recommendations were made at the beginning of April and are the cause of the initial peak in stringency.

More stringent recommendation regarding restaurants was announced on the 18:th of December. New recommendations contained 4 people per company, restaurants not being able to sell alcohol after 20:00 and stores needing to quantify the maximum amount of customers who could be in the store at the same time (Regeringen, 2020b). On the 8:th of January, a pandemic law was put into place. This law gave the authorities legislative power over the restrictions. The restrictions were no longer recommendation based but were supported by law. Restrictions regarding stores, gyms etc needing to have 10 square meters per person were implemented during this time (Folkhälsomyndigheten, 2021). Restrictions are supposed to be less stringent beginning the first of June 2021 (Krisinformation, 2021).

The restrictions affected the industries where work from home was not an option the hardest. Industries such as restaurants and commerce were directly targeted by recommendations and restrictions. Other industries were also affected but could either manage better or were given exemptions.

5.3 Changes to policies to dampen the impact on the labour market

The unemployment benefits and the requirements to receive them has changed from before the Covid-19 pandemic.

The requirements to receive base compensation has been eased. A person must only have worked 60 hours a month during the last six months or having worked 420 hours during six consecutive months with at least 40 hours each of the months. The sum of base compensation has been increased to a maximum of 11 220 SEK per month in comparison to the earlier 8 030 SEK per month (Regeringen, 2021a).

The requirements to receive income-based compensation have also been eased. A person needs to have been a member for 12 months. This is the same as before the reform. However, 1 month of membership counts as 4 months after the reform. A person who has been a member 3 months before being unemployed is now counted as having been a member for 12 months, making that person eligible for income-based compensation. The maximum sum of compensations has also been increased from 20 020 SEK the first 100 days of unemployment to 26 400 SEK. From day 101 to day 300, the compensation has been increased from a maximum of 16 720 SEK to a maximum of 22 000 SEK. Note that the same rule regarding the share of earlier income applies. During the first 200 days, a person can receive a maximum of 80% of their earlier wage. From Day 201 to 300 the share of earlier income is reduced to 70% (Regeringen, 2021a).

A furlough scheme has been implemented to dampen the financial impact on companies and workers which is depicted in table 7. Companies can reduce employment whilst still being able to pay their workers a reasonable wage. Instead of laying people off, companies can reduce the working hours to fit their need. They still have their workers employed, just to a lesser extent. Workers can still consume and spend the same amount of money as before

whilst companies spend less money on labour. The difference in cost between what the employer pays and what the worker receives is paid by the government. The compensation and cost for employers vary depending on the level of job reduction.

Level	Reduction of work	Reduction of the wage for the worker	Reduction of wage paid by the employer	Compensation by the government to the employer	The total reduction of costs for the employer
1	20%	4%	1%	15%	19%
2	40%	6%	4%	30%	36%
3	60%	7,50%	7,50%	45%	52,5%
4	80%	12%	8%	60%	72%

Table 7 Furlough scheme in Sweden, 2020 and 2021

Source: (Regeringen, 2021c)

During the period the 7th of April 2020 to the 21st of May 2021, close to 75 000 applications regarding furlough were granted. Circa 32 700 million SEK were granted for these 75 000 applications during the same period (Ekonomifakta, 2021b). Policies to decrease the social fees a company has to pay has also been implemented (Regeringen, 2020a). Several other policies have been implemented since the beginning of the Covid-19 crisis to dampen the financial impact on companies in Sweden (Regeringen, 2021b).

As we have discussed, policies to keep companies afloat and to keep unemployed and less unemployed financially well has been implemented. The purpose of these policies is to keep consumption on relatively normal levels while not bankrupting companies.

6. Event study & discussion of the labour market during Covid-19 in Sweden

We have discussed different industries and employment in the labour market. We have also discussed policies made to contain the virus while keeping the economy afloat and dampening the impact on the labour market and unemployment.

In this section, we discuss the changes in the labour market during the Covid-19 crisis. We use one test method and perform three different test specialisations. We then discuss what the result implies about changes in the labour market during the Covid-19 crisis.

6.1 Method/data

We test three different datasets and see whether the variables have significantly changed during the Covid-19 pandemic. The three variables we use are: the unemployment rate, average working hours per week and worker and total working hours in different industries. We test whether the variables have changed by comparing two periods surrounding the beginning of the crisis. The test method is explained in further detail down below.

Chart 10 Unemployment rate in Sweden, 2019-03 – 2021-02

Source: (OECD, 2021g)

Chart 10 depicts the unemployment rate from March 2019 to February 2021. The grey shaded areas indicate the periods that we compare in our analysis.

The reason we test unemployment is that it is a widely used measurement of employment and the state of the labour market. We hypothesise that the unemployment rate would have changed during the corona crisis.

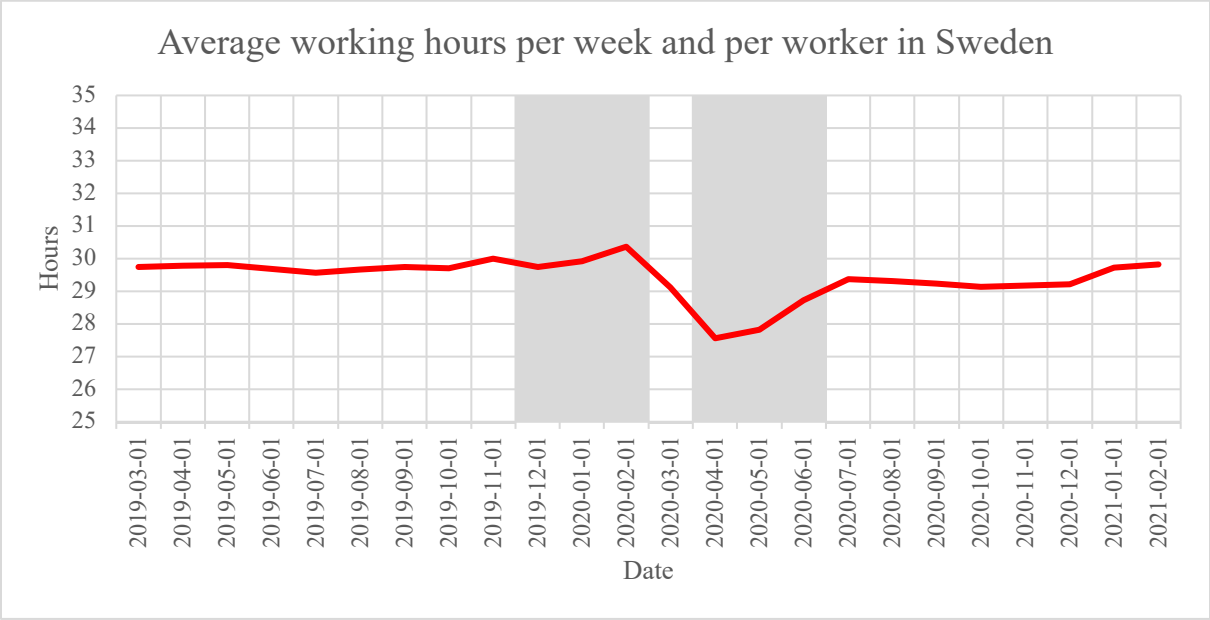

Chart 11 Average working hours per week and per worker in Sweden, 2019-03 – 2021-02

Source: (Statistiska Centralbyrån, 2021c)

Chart 11 depicts the average working hours per week and per worker during the period March 2019 to February 2021. The grey shaded areas display the two periods that we compare the variable during.

The reason we test average working is to see whether there might be an underlying decrease in employment that we do not see from the unemployment data. If the furlough policies have been effective can also be seen if there has been a decrease in average working hours. We hypothesise that average working hours have decreased during the Covid-19 pandemic.

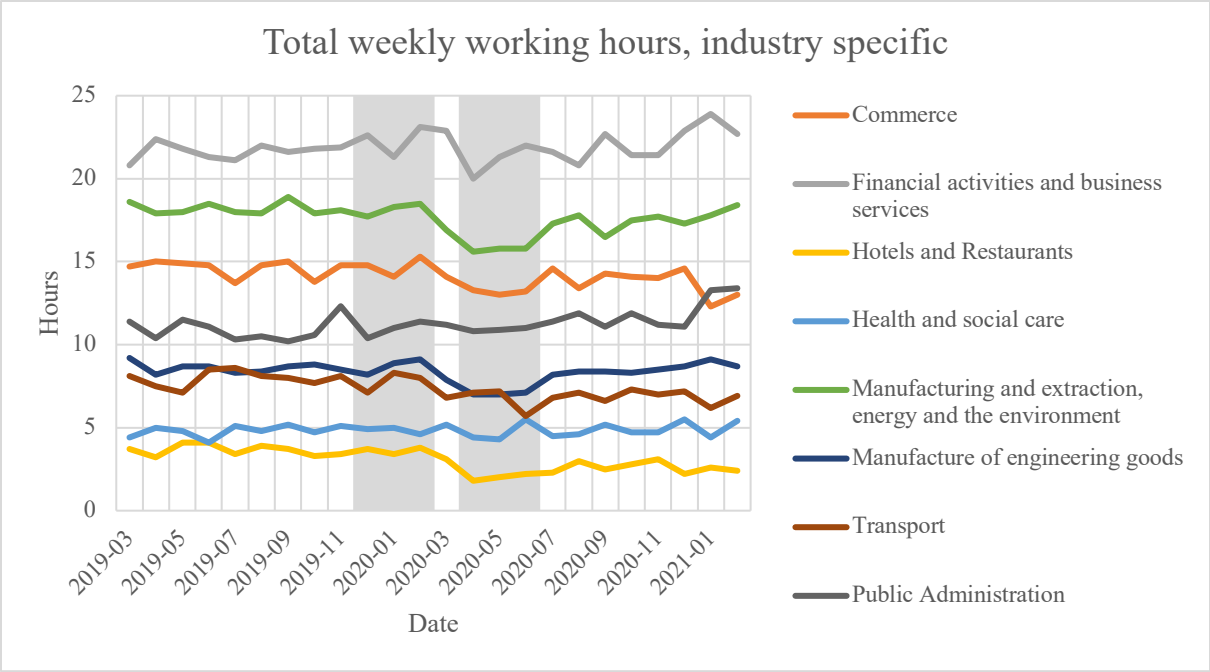

Chart 12 Total weekly working hours in Sweden, industry-specific, 2019–03 – 2021-02

Source: (Statistiska Centralbyrån, 2021c)

Chart 12 displays the total weekly working hours for 8 different industries during the period March 2019 to February 2021. The areas that are shaded grey represent the two time periods that we compare the variables for.

The reason we test total working hours per week for different industries is to see whether the labour market has been hit asymmetrically from the Covid-19 pandemic. We test the change in total working hours for several industries. We conclude that an asymmetrical impact on the labour market has occurred if we see a change in some industries whilst we do not see a change in other industries. We hypothesise that there is an asymmetrical effect on the labour market. This has occurred due to certain industries ability to work from home and restrictions specifically targeting certain other industries.

The method we use to test whether there has been a change in the variables is a version of an event study method described by Craig Mackinlay in his paper "Event studies in Economics and Finance" (MacKinlay, 1997). The method consists of analysing the change in a variable from a particular event. A period before the event is used to estimate the appearance and nature of the variable. The test then compares the data after the event to the data before the event. The period that the data is collected for after the event is called the observation period.

If there is a difference in the data between the estimation period and the observation period, we conclude that the variable has changed after the particular event.

In our test, we start by defining the event. The event in our case is the initial announcement and knowledge of the spread of Covid-19 being a pandemic. The 11:th of March 2020 was the date when Sweden saw its first death and the day when the world health organisation declared the spread of Covid-19 a pandemic. The month of March 2020 is therefore used as the event period. The estimation period consists of three months before March 2020. The observation period consists of three months after March 2020. We call the estimation period for period 1 and the observation period for period 2. The different periods and lengths are depicted in chart 13.

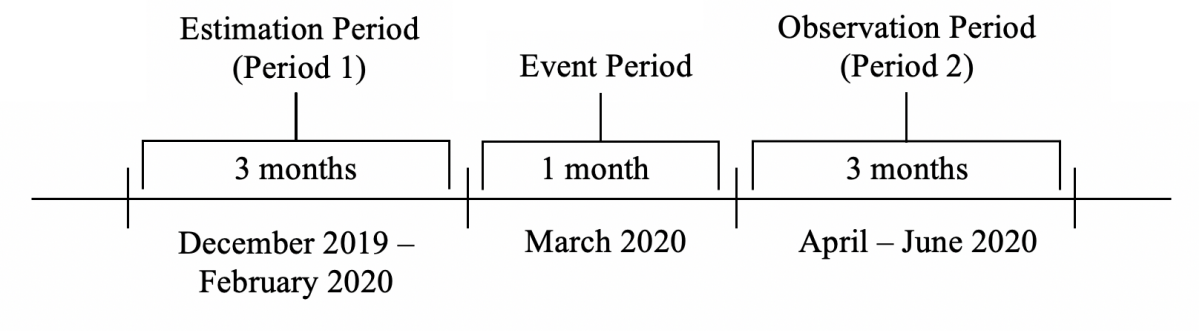

Chart 13, Events study periods

To test the change in the variable, we test whether there is a change in the mean or the variance in the data between period 1 and period 2.

To test the mean, we use a t-test for paired two sample means. The two samples are from the same variables which is the reason this test is used. The null hypothesis for this test is that the difference between the mean for period 1 and period 2 equals zero. If the difference between the mean is significantly different from zero, we reject the null hypothesis. We set α = 0,05. If the p-value is lower than α = 0,05, we reject the null hypothesis. A rejection of the null hypothesis means there has been a significant change in the variable during the Covid-19 crisis.

$$H_0: \mu_{period\ 1} - \mu_{period\ 2} = 0$$

$$H_a: \mu_{period\ 1} - \mu_{period\ 2} \neq 0$$

$$\alpha = 0.05$$

μ = Mean

The equations above display the null hypothesis and the alternative hypothesis for our t-test where we test the means. If the difference between the mean in the two periods equals zero, they are regarded as being equal.

To test the variances, we use an F-test for the variance of two samples. The null hypothesis for this test is that the difference between the variance from period 1 and period 2 equals zero. If the difference between the variances in period 1 and period 2 is significantly different from zero, we reject the null hypothesis. We set α = 0,05. If the p-value is lower than α = 0,05 we reject the null hypothesis. If we reject the null hypothesis, we conclude that the variable has changed during the Covid-19 crisis.

$$H_0: \sigma^2_{period\ 1} - \sigma^2_{period\ 2} = 0$$

$$H_a: \sigma^2_{period\ 1} - \sigma^2_{period\ 2} \neq 0$$

$$\alpha = 0.05$$

σ^2 = Variance

The equations above show the null hypothesis and the alternative hypothesis for our F-test. If the difference between the variances for the two periods equals zero, they are regarded as being equal.

The data we use for all three tests are monthly and seasonally adjusted. Monthly data is used to get enough periods to make any conclusions while still maintaining accuracy in the data. If we use a smaller interval such as a day or a week, we could encounter issues. By using monthly data, weekly or daily spikes is not as present as an average for the month is presented. We use seasonally adjusted data to divert seasonal changes away from the data set. Changes in the variable that occur due to the event could be mixed up to changes due to the season if we were to not use seasonally adjusted data (U.S. Bureau of labor statistics, 2001). The data for test 1 through 3 can be found in table 11 through 13 in appendix B.

Test	Method	Dependent variable	Reason for test
1	Event study	Unemployment rate	Test whether the Covid-19 crisis has impacted the unemployment rate
2	Event study	Average working hour per week and worker	Test whether the Covid-19 crisis have impacted the average working hours per week and worker
3	Event study	Total working hours per week and industry	Test whether an asymmetric effect on the labour market has occurred

Table 8 Reasoning behind tests

Table 8 displays the difference between the tests and the reasoning being them.

We have discussed the methodology and the data we use in the tests. In the next section, we display the results from the tests and discuss what these results imply.

6.2 Result/Discussion

Event study			
		p-value	
Test 1	t-test Unemployment rate	0,0145	**
	F-test Unemployment rate	0,2753	
Test 2	t-test Average working hours per week and worker	0,0073	***
	F-test Average working hours per week and worker	0,2118	
Test 3	t-test		
	Commerce	0,0327	**
	Financial activities and business services	0,2433	
	Hotels and Restaurants	0,0078	***
	Health and social care	0,8609	
	Manufacturing and extraction, energy and the environment	0,0052	***
	Manufacture of engineering goods	0,0212	**
	Transport	0,2301	
	Public Administration	0,8995	
	F-test		
	Commerce	0,0603	
	Financial activities and business services	0,4560	
	Hotels and Restaurants	0,4800	
	Health and social care	0,0890	
	Manufacturing and extraction, energy and the environment	0,0714	
	Manufacture of engineering goods	0,0147	**
	Transport	0,3567	
	Public Administration	0,0380	**

Table 9 Event study results

Significance at α = 0,1 level = *, Significance at α = 0,05 level = **, Significance at α = 0,01 level = ***

Table 9 show the result for our three different tests.

Test 1:

For the first test, we saw a significant change in the mean of the unemployment rate. The result suggests that the unemployment rate has changed during the Covid-19 pandemic. We saw from the data that we plotted in chart 10 that this change resulted in an increase.

Labour market

The restrictions put in place to contain the spread has decreased the demand for labour in the labour market. A decreased demand for labour along with non-flexible wages decreases the amount of labour hired and increases the unemployment rate.

The supply of labour in the labour market has also decreased (Hensvik *et al.*, 2021). This has happened due to unemployed people not expecting job opportunities to be available. The unemployed people stop actively looking for jobs or submit fewer job applications. The lower supply of labour would further decrease the amount of labour hired.

Goods market

Aggregate demand

A negative goods demand shock has hit the economy, this has happened even though the restrictions in Sweden has not been too stringent. Sweden exports goods internationally, when the demand falls internationally, Sweden is also affected. The negative demand shock has not only happened due to less consumption in Sweden but also due to less consumption internationally (Bricco *et al.*, 2020).

We also know that Sweden is a small open economy with a flexible exchange rate. A movement in the international interest rates downwards would affect the Swedish economy. This is something that has occurred (OECD, 2021c). Through capital inflows and appreciation of the Swedish currency, the demand for Swedish goods declines.

These are some of the explanations as to why aggregate demand is lower domestically due to the crisis.

Aggregate supply

Labour market restrictions have led to the number of workers that are present at the workplace having decreased. The availability of goods has also been decreased due to restrictions (Folkhälsomyndigheten, 2021). This in turn has led to a negative aggregate supply shock in the economy. Fewer goods and services are being produced which creates a negative aggregate supply shock to the economy.

Goods market effect on unemployment

Both the negative aggregate supply and the negative aggregate demand shocks create a negative effect on employment. Less demand for goods means less money for companies to spend on labour. Fewer goods being produced leads to fewer goods being sold. Fewer goods being sold further decreases the money a company can spend on labour.

Through tax breaks, financial relief efforts and furlough schemes, companies have been able to save more money than they otherwise would. Lower pressure on the finances of companies is positive for employment. These policies most likely dampened the effect on unemployment.

External effects

We have established that the unemployment rate has risen during the Covid-19 crisis. There might be hidden effects that we cannot see from our result. There has been a fewer number of job searches during the pandemic (Hensvik *et al.*, 2021). This might be because people do not think that there are any jobs available. This decrease in jobs searches increases the chance of an application actual resulting in a job. This is of course positive. But when people do not actively search, they are not classed as unemployed. There is a possibility that unemployment is higher than the numbers suggest. The unemployment rate has risen but maybe not as much as the decrease in employment. The unemployment rate might be higher than what the data suggests.

If the unemployment rate is too great for too long, we might experience long term negative effects. If too many people are unemployed for too long, they lose their value in the labour market. If the skill level of the labour force falls, it becomes harder for employers to find suitable workers, hence creating greater unemployment.

Connection to empirical results

The unemployment benefits as a share of previous income increased at the early stages of the crisis as indicated by section 5.3. The event study analyses the short term changes to the unemployment rate. We can therefore discuss the implications of extending these benefits in the short run with the short term unemployment benefits in our regression analysis. The regression implies a negative relationship between the short term unemployment benefits and unemployment. The extended benefits during the crisis likely have increased the consumption for the unemployed population which in turn positively affect the demand for goods and services in Sweden. The demand might have been even lower without the benefits extensions. The extension does however intent to last for a longer period which might still make people disincentivised to search for a job. The earlier research regarding the 2008 crisis does however suggest that extending benefits does not have any substantial negative effect on employment (Boone *et al.*, 2016). Extending benefits in times of crisis most likely have a positive effect on consumption, making unemployment benefits a good policy in times of crisis.

As discussed in section 5, income-based compensations is not only the benefits that have increased but so has the base income compensation. The base income compensation has not as stringent requirements to receive them as the income-based. The base income consists of cash benefits to the unemployed and is not calculated as a share of previous income. Some of the properties in the base income are similar to the properties of the variable public unemployed spending as both consists of cash benefits given to people who are unemployed and is not calculated as a share of previous income. The public unemployment spending variable does also include other factors but most of this variable consist of cash spending hence the comparison. Likely, this increase has positively affected consumption in society, relative to the level of benefits before. There is however a possibility that it has also disincentivised unemployed people to look for a job. Public spending on unemployment is associated with an increase in unemployment, as indicated by table 2, which would then indicate that an increase in base income compensation has also positively affected

unemployment. We also know that applications have decreased during the pandemic (Hensvik *et al.*, 2021). This would then confirm that a disincentivising effect for job searching has most likely occurred. We should also point out that the positive relationship between public unemployment spending and unemployment could be due to spending increasing in situations such as the Covid-19 crisis. The restrictions to restrict movement in society and uncertainty of when restrictions will be less stringent can also be a factor for the lower amount of applications.

Trade union density has been steadily decreasing since the 1990s as indicated by chart 7. The decline in trade union density most likely have made the increase in unemployment less than it would otherwise have been during the Covid-19 crisis. Our regression suggests a positive relationship between trade union density and unemployment which would imply that the decrease in trade union density seen in chart 7 is positive for employment during the Covid-19 crisis. Positive in relation to how it would have been if the crisis had occurred earlier.

Test 2

For the second test, we did see a significant change in the mean of average working hours. The result suggests that the average working hours per week and per worker has changed during the Covid-19 pandemic. From the plotted data in chart 11, we can see that this change has resulted in a decrease in average working hours.

Most of the change occurred in February and March. This indicates that the effect was already seen before the corona crisis was classified as a pandemic.

The decrease in average working hours could be due to the policies implemented at the beginning of the Covid-19 crisis. The furlough policies could be the reason why people started to work less. The number of working hours is almost back to normal. Though, a decrease during any length of time can have consequences. The unemployment that we saw at the early stages, and still, would probably be higher if the furlough scheme wasn't implemented. If the furlough scheme was not implemented, fewer people would have stayed employed. The furlough scheme might have under-valued the actual decrease in employment if we were to only look at the unemployment rate.

The decrease that we have seen can be a good thing. Decreased average working hours means that companies have spent less money per worker. This in turn means that companies can

have more employees for the same amount of money. More people have stayed employed due to this. If more people are employed, then not as many people will lose work experience due to unemployment. When the economy goes back to normal, these people won't have to look for a job again, speeding up the process back to pre-crisis levels.

We know that equilibrium unemployment could rise if unemployment rises too high during a certain period (Burda and Wyplosz, 2017). The risk of the equilibrium unemployment rising, therefore, decreased by making workers work fewer hours.

Test 3

For the third test, we did see a significant change in the mean for the following industries: commerce, hotels and restaurants, manufacturing and extraction, energy and environment and manufacturing of engineering goods. We also saw a change in the variance for manufacturing of engineering goods and public administration. The result suggests that these five industries have seen a change in the total working hour per week since the Covid-19 pandemic.

From the plotted data in chart 12, we conclude that the change has been negative for the following industries: commerce, hotels and restaurants, manufacturing and extraction, energy and environment and manufacturing of engineering goods. The change in public administration cannot be seen as having a negative shift. If anything, there has been an increase in employment opportunity in this industry. We conclude that an asymmetrical effect of employment opportunity has occurred in the labour market.

The reason we see an asymmetrical effect is due to restrictions, essentiality and teleworkability. The industries that have seen an effect are less likely to be able to perform their job through teleworking. industries such as those relating to manufacturing, commerce and hotels and restaurants have to be at a particular place to perform their job. Health care services are also less teleworkable but restrictions have not affected this industry because of essentiality.

Commerce and hotels and restaurants are two industries where the wages are in the lower end of the distribution (table 6). Workers in these industries are relatively lower paid than other industries. We have seen a decline in employment opportunity in these industries. This would imply that the already low-paid people in society have been hit the hardest during the covid-

19 pandemic. Jobs in the financial activities and business services industry are relatively high paid. We have not seen any change in employment opportunity in this industry.

The biggest employers in Sweden are highly represented by the manufacturing industries. Together the two manufacturing-related industries employ 30% of total employees in Sweden. These industries experiencing a decline in employment opportunity can therefore cause a great increase in unemployment. Commerce employs 11% of employed people (chart 8). A decrease in working opportunity in this industry can also have great impacts on unemployment. A decrease in working opportunity in commerce probably does not create as large of a labour market impacts as a decrease in the manufacturing industries. Another industry where we saw a decrease in work opportunity is hotels and restaurants. Hotels and restaurants are in the group of other industries. A change in work opportunity in this group does not have the same impact as a decrease in any of the other industries we discussed earlier.

If we move on to analyse each industry's share of GDP, we see that the biggest one is mining and manufacturing. These industries are also the biggest employers in Sweden. However, the shares differ. The employment in these industries is 30% while the share of GDP is 15% (table 5). A decrease in employment opportunity in these industries impacts the overall unemployment in Sweden to a greater extent than it impacts Sweden's GDP. Note that the data does not group the same companies, but the groups are similar enough to compare the two. Commerce makes up about the same share of GDP as the share of employed people being in commerce. The employment opportunity change for this industry impacts the overall unemployment and the GDP to about the same degree.

We can also see from the shares of industries to GDP that Sweden has a diverse selection of industries that influence the GDP (table 5). Had Sweden been more restaurant and hotel oriented, we might have seen a larger negative impact on GDP during the Covid-19 crisis.

7. Conclusion

Our thesis aims to examine which mechanisms that affect the labour market, more specifically unemployment. How the labour market and unemployment has been affected during the Covid-19 crisis has also been investigated. By getting the information regarding how the labour market is affected by different mechanism and agents we can start to discuss future policies to positively impact the labour market. We can prioritise spending and allocate resources where they make the most utility.

During the first part, we focused on the general labour market across countries with a similar economic situation as Sweden. We tested and concluded which factors were positively and negatively correlated with unemployment. This test was performed using a regression analysis with unemployment as the dependent variable.

We concluded that spending money on compensation for the unemployed and trade unions were positively correlated with unemployment and that short term (2 months) unemployment benefits were negatively correlated with unemployment. External effects of these factors that we could not see from our regression were also discussed.

Trade unions allocate the power from the employer to the employees creating a more secure and just labour market. Public spending on the unemployed most likely has more positive external effect than the correlation to increased unemployment that it has. More spending leads to longer unemployment duration which increases the chances of a job better fitting that individual's skill level. This effect benefits both employee and employer. The employee most likely gets a higher wage for a job that requires higher skill. The employer gets a person that better fits their criteria for that job.

Short term unemployment benefits were negatively correlated with unemployment. This could be due to unemployment benefits increasing (or at least preventing a decrease) consumption for unemployed individuals. An individual who gets benefits for 2 months realises that they still need to look for a job relatively quickly after being unemployed. While they keep consumption high, they are still not disincentivised to apply for a job, hence correlation with a decrease in unemployment.

During the second part of the thesis, we narrowed down our analysis to the Swedish labour market. A brief discussion of how the labour market operates with regards to unions and unemployment benefits was presented. We then discussed changes to the labour market during the Covid-19 pandemic. We discussed policies that were put into place during the covid-19 crisis. We also discussed how the labour market had changed during the pandemic.

We performed an event study to test the effects on the labour market during corona. We tested the unemployment rate, average working hours per week and worker and total weekly hours worked in different industries.

We saw an increase in the unemployment rate. This was both due to restrictions on the labour market and a negative shift in the supply and demand of goods on the goods market.

We saw a decrease in average working hours per week and worker. It was likely because of the furlough scheme put into place that let companies keep their employees employed but to a lesser extent. The furlough policy resulted in more being employed but for fewer hours per week. A decrease in the demand for labour was also likely responsible for the decrease in average working hours.

The total weekly working hours had been changed in some industries while it had not been in others. We, therefore, concluded that an asymmetrical decrease in employment opportunity had occurred. The ones who were impacted were often in the lower part of the wage distributions while the industries who had not been impacted were often in the higher part of the wage distribution.

The biggest employers who were industries in manufacturing had all seen a negative shift in employment opportunity. Financial activities and business services were also in the group of employers that employed the most. But this industry had not been impacted.

Lastly, we discussed the impact on employment opportunities for different industries and their share of the GDP. We concluded that the biggest contributors of Sweden's GDP had been impacted but their share of GDP was not as large as their share of employed people. The

negative effect on GDP should therefore be less than the one for overall unemployment due to fewer hours being worked in these industries.

To further expand the research, a longer time frame needs to be examined. The long-term effects of the Covid-19 crisis on the labour market and unemployment cannot be examined as of writing this thesis. Researchers in the future could perform analyses of the long-term effect and build upon this short to medium run analysis to better understand the whole experience of the Covid-19 crisis with regards to the labour market and unemployment.

Reference list

Arbetsförmedlingen (2021) *Ersättning från a-kassa*, *Arbetsförmedlingen*. Available at: https://arbetsformedlingen.se/for-arbetssokande/arbetslos---vad-hander-nu/ersattning-fran-a-kassa (Accessed: 16 May 2021).

Bhandari, A. (2020) *Multicollinearity | Detecting Multicollinearity with VIF*, *Analytics Vidhya*. Available at: https://www.analyticsvidhya.com/blog/2020/03/what-is-multicollinearity/ (Accessed: 25 May 2021).

Boone, C. *et al.* (2016) 'Unemployment Insurance Generosity and Aggregate Employment', *American Economic Journal: Economic Policy*, 13(2), pp. 58–99. doi: 10.1257/pol.20160613.

Bricco, J., Misch, F. and Solovyeva, A. (2020) *IMF Working Papers Volume 2020 Issue 191: What are the Economic Effects of Pandemic Containment Policies? Evidence from Sweden (2020)*, *imfsg*. Available at: https://www.elibrary.imf.org/view/journals/001/2020/191/001.2020.issue-191-en.xml (Accessed: 16 May 2021).

Burda, M. C. and Wyplosz, C. (2017) *Macroeconomics : a European text*. 7th edn. Oxford : Oxford University Press.

Chang, J. and Hung, H. (2016) 'Trade Unions, Unemployment, Economic Growth, and Income Inequality', *Macroeconomic Dynamics*, 20(1), pp. 404–428. doi: 10.1017/S1365100514000443.

Christopher Dougherty (2016) *Introduction to Econometrics*. 5:th edn. Oxford : Oxford University Press.

Ekonomifakta (2021a) *BNP - Sverige*, *Ekonomifakta*. Available at: https://www.ekonomifakta.se/Fakta/Ekonomi/Tillvaxt/BNP---Sverige/ (Accessed: 16 May 2021).

Ekonomifakta (2021b) *Korttidspermittering*, *Ekonomifakta*. Available at: https://www.ekonomifakta.se/Fakta/Arbetsmarknad/Arbetsloshet/korttidspermittering/ (Accessed: 25 May 2021).

Fana, M., Torrejón Pérez, S. and Fernández-Macías, E. (2020) 'Employment impact of Covid-19 crisis: from short term effects to long terms prospects', *Journal of Industrial and Business Economics*, 47(3), pp. 391–410. doi: 10.1007/s40812-020-00168-5.

Farooq, A., Kugler, A. and Muratori, U. (2020) *Do Unemployment Insurance Benefits Improve Match Quality? Evidence from Recent U.S. Recessions*. w27574. Cambridge, MA: National Bureau of Economic Research, p. w27574. doi: 10.3386/w27574.

Folkhälsomyndigheten (2020) *Nya allmänna råd: Håll avstånd och ta personligt ansvar — Folkhälsomyndigheten*. Available at: http://www.folkhalsomyndigheten.se/nyheter-och-press/nyhetsarkiv/2020/april/nya-allmanna-rad-hall-avstand-och-ta-personligt-ansvar/ (Accessed: 16 May 2021).

Folkhälsomyndigheten (2021) *Butiker, gym och köpcentrum måste begränsa antalet besökare — Folkhälsomyndigheten*. Available at: http://www.folkhalsomyndigheten.se/nyheter-och-press/nyhetsarkiv/2021/januari/butiker-gym-och-kopcentrum-maste-begransa-antalet-besokare/ (Accessed: 16 May 2021).

Gartner, H., Schank, T. and Schnabel, C. (2010) 'Wage Cyclicality Under Different Regimes of Industrial Relations', *Industrial Relations: A Journal of Economy and Society*, 52(2), pp. 516–540. doi: https://doi.org/10.1111/irel.12022.

Hensvik, L., Le Barbanchon, T. and Rathelot, R. (2021) 'Job search during the COVID-19 crisis', *Journal of Public Economics*, 194, p. 104349. doi: 10.1016/j.jpubeco.2020.104349.

Katz, L. F. and Meyer, B. D. (1990) 'The impact of the potential duration of unemployment benefits on the duration of unemployment', *Journal of Public Economics*, 41(1), pp. 45–72. doi: 10.1016/0047-2727(92)90056-L.

Krisinformation (2020) *Första bekräftade fallet av coronavirus i Sverige*. Available at: https://www.krisinformation.se/nyheter/2020/januari/forsta-bekraftade-fallet-av-coronavirus-i-sverige (Accessed: 16 May 2021).

Krisinformation (2021) *Restriktioner och förbud*. Available at: https://www.krisinformation.se/detta-kan-handa/handelser-och-storningar/20192/myndigheterna-om-det-nya-coronaviruset/restriktioner-och-forbud (Accessed: 16 May 2021).

MacKinlay, A. C. (1997) 'Event Studies in Economics and Finance', *Journal of Economic Literature*, 35(1), pp. 13–39.

Marinescu, I. (2015) 'The General Equilibrium Impacts of Unemployment Insurance: Evidence from a Large Online Job Board', p. 72.

Medlingsinstitutet (2019) *Minimilöner*, *Medlingsinstitutet*. Available at: https://www.mi.se/forhandling-avtal-2/minimiloner/ (Accessed: 16 May 2021).

Medlingsinstitutet (2021) *Förhandling & avtal*, *Medlingsinstitutet*. Available at: https://www.mi.se/forhandling-avtal-2/ (Accessed: 16 May 2021).

Moffitt, R. A. (2014) 'Unemployment benefits and unemployment', *IZA World of Labor*. doi: 10.15185/izawol.13.

OECD (2021a) *Benefits and wages - Benefits in unemployment, share of previous income - OECD Data*, *theOECD*. Available at: http://data.oecd.org/benwage/benefits-in-unemployment-share-of-previous-income.htm (Accessed: 16 May 2021).

OECD (2021b) *GDP and spending - Gross domestic product (GDP) - OECD Data*, *theOECD*. Available at: http://data.oecd.org/gdp/gross-domestic-product-gdp.htm (Accessed: 16 May 2021).

OECD (2021c) *Interest rates - Long-term interest rates - OECD Data*, *theOECD*. Available at: http://data.oecd.org/interest/long-term-interest-rates.htm (Accessed: 16 May 2021).

OECD (2021d) *Prices - Inflation (CPI) - OECD Data*, *theOECD*. Available at: http://data.oecd.org/price/inflation-cpi.htm (Accessed: 16 May 2021).

OECD (2021e) *Social protection - Public unemployment spending - OECD Data*, *theOECD*. Available at: http://data.oecd.org/socialexp/public-unemployment-spending.htm (Accessed: 16 May 2021).

OECD (2021f) *Trade Union*. Available at: https://stats.oecd.org/Index.aspx?DataSetCode=TUD (Accessed: 16 May 2021).

OECD (2021g) *Unemployment - Unemployment rate - OECD Data*, *theOECD*. Available at: http://data.oecd.org/unemp/unemployment-rate.htm (Accessed: 16 May 2021).

Our World in Data (2021) *COVID-19: Stringency Index, May 16, 2021*. Available at: https://ourworldindata.org/grapher/covid-stringency-index (Accessed: 16 May 2021).

Regeringen (2020a) *Tillfälligt sänkta socialavgifter med anledning av coronaviruset - Regeringen.se*. Available at: https://www.regeringen.se/artiklar/2020/03/om-forslaget-tillfalligt-sankta-socialavgifter-med-anledning-av-coronaviruset/ (Accessed: 25 May 2021).

Regeringen (2020b) *Ytterligare nationella restriktioner för att hejda smittspridning - Regeringen.se*. Available at: https://www.regeringen.se/artiklar/2020/12/ytterligare-nationella-restriktioner-for-att-hejda-smittspridning/ (Accessed: 16 May 2021).

Regeringen (2021a) *A-kassan förändras tillfälligt - Regeringen.se*. Available at: https://www.regeringen.se/artiklar/2020/04/a-kassan-forandras-tillfalligt/#medlemsvillkoranchor (Accessed: 16 May 2021).

Regeringen (2021b) *För företagare med anledning av covid-19 - Regeringen.se*. Available at: https://www.regeringen.se/regeringens-politik/regeringens-arbete-med-coronapandemin/foretag/.

Regeringen (2021c) *Korttidspermittering - Regeringen.se*. Available at: https://www.regeringen.se/artiklar/2020/03/om-forslaget-korttidspermittering/?TSPD_101_R0=088d4528d9ab2000547dfea357f233465cbb5753517cc810dae7ebc7a1907ed405ad77303edc00c408bffd398d1430009a74fe07ee588bb1f11e4151a96a6c4ae3ef4228a3c51b3fb45e0b968c34816859ae74e246d04085f6091b5e51e952d0 (Accessed: 16 May 2021).

Sallinen, J. P. (2020) 'Första svenska dödsfallet i corona: ”Inhemsk smitta”', *Svenska Dagbladet*, 11 March. Available at: https://www.svd.se/26-nya-coronafall-i-stockholms-lan (Accessed: 16 May 2021).

Statistiska Centralbyrån (2021a) *Arbetslöshet i Sverige*, *Statistiska Centralbyrån*. Available at: http://www.scb.se/hitta-statistik/sverige-i-siffror/samhallets-ekonomi/arbetsloshet-i-sverige/ (Accessed: 16 May 2021).

Statistiska Centralbyrån (2021b) *Medellöner i Sverige*, *Statistiska Centralbyrån*. Available at: http://www.scb.se/hitta-statistik/sverige-i-siffror/utbildning-jobb-och-pengar/medelloner-i-sverige/ (Accessed: 16 May 2021).

Statistiska Centralbyrån (2021c) *Säsongrensade serier, månad*, *Statistiska Centralbyrån*. Available at: http://www.scb.se/hitta-statistik/statistik-efter-amne/arbetsmarknad/arbetskraftsundersokningar/arbetskraftsundersokningarna-aku/pong/tabell-och-diagram/sasongrensade-data/sasongrensade-serier-manad/ (Accessed: 16 May 2021).

Statistiska Centralbyrån (2021d) *Sveriges BNP*, *Statistiska Centralbyrån*. Available at: http://www.scb.se/hitta-statistik/sverige-i-siffror/samhallets-ekonomi/bnp-i-sverige/ (Accessed: 16 May 2021).

Statistiska Centralbyrån (2021e) *Sysselsatta 15-74 år (AKU) efter anknytningsgrad till arbetsmarknaden, näringsgren SNI2007 och kön. År 2009 - 2020*, *Statistikdatabasen*. Available at: http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__AM__AM0401__AM0401I/NAKUSysselSNI07Ar/ (Accessed: 16 May 2021).

Svenskt Näringsliv (2021) *Så fungerar kollektivavtal*, *Svenskt Näringsliv*. Available at: https://www.svensktnaringsliv.se/sakomraden/arbetsgivarsamverkan/sa-fungerar-kollektivavtal_1006616.html (Accessed: 16 May 2021).

U.S. Bureau of labor statistics (2001) *What is seasonal adjustment?* Available at: https://www.bls.gov/cps/seasfaq.htm (Accessed: 25 May 2021).

World Health Organisation (2020a) *WHO | Pneumonia of unknown cause – China*, *WHO*. World Health Organization. Available at: http://www.who.int/csr/don/05-january-2020-pneumonia-of-unkown-cause-china/en/ (Accessed: 16 May 2021).

World Health Organisation (2020b) *WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020*. Available at: https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020 (Accessed: 16 May 2021).

Appendix A

Data Regression analysis

Table 10 depicts the data used in the regression analysis.

U = Unemployment rate, UB = Unemployment benefits, TD = Trade union density, GDP = Gross Domestic Product, CPI = Inflation, PUS = Public unemployment spending, OECD = GDP per capita for the whole OECD (time specific effect).

Country	Year	U	TD	UB	GDP	CPI	PUS	OECD
Austria	2001	4%	36%	55%	238 982	2,7%	0,9%	25 417
Austria	2002	4%	36%	55%	251 985	1,8%	1,1%	26 217
Austria	2003	5%	35%	55%	260 788	1,4%	1,2%	26 989
Austria	2004	6%	35%	55%	275 770	2,1%	1,2%	28 429
Austria	2005	6%	34%	55%	288 087	2,3%	1,1%	29 790
Austria	2006	5%	32%	55%	310 998	1,4%	1,0%	31 770
Austria	2007	5%	30%	55%	326 699	2,2%	0,9%	33 306
Austria	2008	4%	30%	55%	343 813	3,2%	0,8%	34 160
Austria	2009	5%	29%	55%	341 644	0,5%	1,1%	33 249
Austria	2010	5%	29%	55%	351 610	1,8%	1,0%	34 537
Austria	2011	5%	28%	55%	373 031	3,3%	0,9%	35 896
Austria	2012	5%	28%	55%	391 635	2,5%	0,9%	36 857
Austria	2013	5%	28%	55%	406 370	2,0%	1,0%	38 198
Austria	2014	6%	28%	55%	417 060	1,6%	1,0%	39 341
Austria	2015	6%	27%	55%	430 976	0,9%	1,1%	40 493
Belgium	2001	7%	56%	77%	296 259	2,5%	2,8%	25 417
Belgium	2002	8%	56%	80%	312 900	1,6%	3,0%	26 217
Belgium	2003	8%	54%	80%	320 633	1,6%	3,2%	26 989
Belgium	2004	8%	54%	77%	333 857	2,1%	3,2%	28 429
Belgium	2005	8%	54%	77%	347 658	2,8%	3,2%	29 790
Belgium	2006	8%	55%	77%	371 415	1,8%	3,2%	31 770

Belgium	2007	7%	55%	77%	390 458	1,8%	3,0%	33 306
Belgium	2008	7%	55%	77%	405 729	4,5%	3,1%	34 160
Belgium	2009	8%	55%	88%	407 862	-0,1%	3,6%	33 249
Belgium	2010	8%	54%	86%	434 413	2,2%	3,5%	34 537
Belgium	2011	7%	55%	85%	451 933	3,5%	3,5%	35 896
Belgium	2012	8%	55%	87%	469 720	2,8%	3,3%	36 857
Belgium	2013	8%	55%	97%	487 344	1,1%	3,2%	38 198
Belgium	2014	9%	54%	96%	503 620	0,3%	3,2%	39 341
Belgium	2015	9%	54%	95%	520 878	0,6%	2,9%	40 493
Denmark	2001	5%	74%	86%	157 816	2,3%	0,0%	25 417
Denmark	2002	5%	74%	86%	164 720	2,4%	0,0%	26 217
Denmark	2003	5%	72%	86%	165 968	2,1%	0,0%	26 989
Denmark	2004	6%	72%	86%	177 870	1,2%	0,0%	28 429
Denmark	2005	5%	72%	86%	185 074	1,8%	0,0%	29 790
Denmark	2006	4%	70%	85%	202 726	1,9%	0,0%	31 770
Denmark	2007	4%	69%	84%	212 771	1,7%	0,0%	33 306
Denmark	2008	4%	68%	82%	226 767	3,4%	0,0%	34 160
Denmark	2009	6%	68%	83%	222 918	1,3%	0,0%	33 249
Denmark	2010	8%	67%	84%	238 749	2,3%	0,0%	34 537
Denmark	2011	8%	68%	83%	247 352	2,8%	0,0%	35 896
Denmark	2012	8%	68%	84%	250 525	2,4%	0,0%	36 857
Denmark	2013	7%	68%	84%	262 368	0,8%	0,0%	38 198
Denmark	2014	7%	67%	84%	270 331	0,6%	0,0%	39 341
Denmark	2015	6%	67%	84%	278 748	0,5%	0,0%	40 493
Finland	2001	9%	75%	61%	144 267	2,6%	2,0%	25 417
Finland	2002	9%	74%	63%	148 764	1,6%	2,1%	26 217
Finland	2003	9%	73%	62%	151 290	0,9%	2,1%	26 989
Finland	2004	9%	72%	61%	162 993	0,2%	2,1%	28 429
Finland	2005	8%	71%	60%	168 147	0,6%	2,0%	29 790

Finland	2006	8%	71%	59%	181 207	1,6%	1,8%	31 770
Finland	2007	7%	71%	58%	199 873	2,5%	1,5%	33 306
Finland	2008	6%	70%	57%	212 981	4,1%	1,4%	34 160
Finland	2009	8%	71%	57%	202 878	0,0%	1,9%	33 249
Finland	2010	8%	70%	57%	209 097	1,2%	1,9%	34 537
Finland	2011	8%	70%	57%	220 471	3,4%	1,6%	35 896
Finland	2012	8%	70%	59%	221 286	2,8%	1,7%	36 857
Finland	2013	8%	68%	59%	225 680	1,5%	1,9%	38 198
Finland	2014	9%	68%	71%	228 059	1,0%	2,2%	39 341
Finland	2015	9%	66%	67%	232 868	-0,2%	2,3%	40 493
France	2001	9%	9%	74%	1 687 448	1,6%	1,4%	25 417
France	2002	9%	10%	73%	1 762 926	1,9%	1,6%	26 217
France	2003	9%	9%	71%	1 751 798	2,1%	1,8%	26 989
France	2004	9%	9%	76%	1 820 723	2,1%	1,8%	28 429
France	2005	9%	9%	75%	1 926 880	1,7%	1,7%	29 790
France	2006	9%	9%	74%	2 062 931	1,7%	1,4%	31 770
France	2007	8%	9%	69%	2 181 667	1,5%	1,3%	33 306
France	2008	7%	9%	69%	2 259 256	2,8%	1,2%	34 160
France	2009	9%	9%	69%	2 245 566	0,1%	1,5%	33 249
France	2010	9%	9%	69%	2 336 460	1,5%	1,6%	34 537
France	2011	9%	9%	69%	2 446 475	2,1%	1,5%	35 896
France	2012	10%	9%	69%	2 474 005	2,0%	1,6%	36 857
France	2013	10%	9%	69%	2 608 524	0,9%	1,6%	38 198
France	2014	10%	9%	69%	2 662 033	0,5%	1,6%	39 341
France	2015	10%	9%	68%	2 718 495	0,0%	1,6%	40 493
Germany	2001	8%	24%	61%	2 337 157	2,0%	1,3%	25 417
Germany	2002	9%	24%	61%	2 406 901	1,4%	1,5%	26 217
Germany	2003	10%	23%	61%	2 465 901	1,0%	1,7%	26 989
Germany	2004	11%	22%	61%	2 583 409	1,7%	1,7%	28 429

Germany	2005	11%	22%	61%	2 622 040	1,5%	1,8%	29 790
Germany	2006	10%	21%	62%	2 810 243	1,6%	1,6%	31 770
Germany	2007	9%	20%	60%	2 981 616	2,3%	1,3%	33 306
Germany	2008	7%	19%	60%	3 103 958	2,6%	1,2%	34 160
Germany	2009	8%	19%	60%	3 017 521	0,3%	1,6%	33 249
Germany	2010	7%	19%	60%	3 187 863	1,1%	1,5%	34 537
Germany	2011	6%	18%	59%	3 415 020	2,1%	1,1%	35 896
Germany	2012	5%	18%	59%	3 487 234	2,0%	1,0%	36 857
Germany	2013	5%	18%	59%	3 628 559	1,5%	1,0%	38 198
Germany	2014	5%	18%	59%	3 807 115	0,9%	1,0%	39 341
Germany	2015	5%	18%	59%	3 889 082	0,5%	0,9%	40 493
Italy	2001	9%	34%	43%	1 597 887	2,8%	0,4%	25 417
Italy	2002	8%	33%	43%	1 639 681	2,5%	0,4%	26 217
Italy	2003	8%	33%	52%	1 671 645	2,7%	0,4%	26 989
Italy	2004	8%	34%	52%	1 703 460	2,2%	0,4%	28 429
Italy	2005	8%	33%	74%	1 746 658	2,0%	0,5%	29 790
Italy	2006	7%	33%	74%	1 884 458	2,1%	0,5%	31 770
Italy	2007	6%	34%	64%	1 992 733	1,8%	0,4%	33 306
Italy	2008	7%	33%	70%	2 089 717	3,3%	0,5%	34 160
Italy	2009	8%	35%	70%	2 046 377	0,8%	0,8%	33 249
Italy	2010	9%	36%	69%	2 085 694	1,5%	0,8%	34 537
Italy	2011	9%	36%	68%	2 173 170	2,8%	0,8%	35 896
Italy	2012	11%	36%	69%	2 172 383	3,0%	0,9%	36 857
Italy	2013	12%	37%	72%	2 187 377	1,2%	1,0%	38 198
Italy	2014	13%	36%	73%	2 200 256	0,2%	1,0%	39 341
Italy	2015	12%	36%	74%	2 240 922	0,0%	1,0%	40 493
Netherlands	2001	3%	22%	71%	532 645	4,2%	1,3%	25 417
Netherlands	2002	4%	22%	71%	556 285	3,3%	1,1%	26 217
Netherlands	2003	5%	21%	70%	553 517	2,1%	1,3%	26 989

Netherlands	2004	6%	21%	70%	582 564	1,3%	1,5%	28 429
Netherlands	2005	6%	22%	70%	614 044	1,7%	1,4%	29 790
Netherlands	2006	5%	21%	73%	669 519	1,1%	1,2%	31 770
Netherlands	2007	4%	20%	75%	718 924	1,6%	1,0%	33 306
Netherlands	2008	4%	20%	76%	763 408	2,5%	0,8%	34 160
Netherlands	2009	4%	20%	76%	737 086	1,2%	1,1%	33 249
Netherlands	2010	5%	20%	76%	748 994	1,3%	1,2%	34 537
Netherlands	2011	5%	19%	76%	777 881	2,3%	1,3%	35 896
Netherlands	2012	6%	19%	76%	792 042	2,5%	1,3%	36 857
Netherlands	2013	7%	18%	76%	827 476	2,5%	1,6%	38 198
Netherlands	2014	7%	18%	74%	830 318	1,0%	1,6%	39 341
Netherlands	2015	7%	18%	74%	851 885	0,6%	1,4%	40 493
Norway	2001	3%	52%	65%	170 532	3,0%	0,5%	25 417
Norway	2002	4%	52%	65%	172 361	1,3%	0,6%	26 217
Norway	2003	4%	51%	65%	175 993	2,5%	0,7%	26 989
Norway	2004	4%	51%	65%	195 224	0,5%	0,7%	28 429
Norway	2005	5%	51%	66%	220 982	1,5%	0,5%	29 790
Norway	2006	3%	51%	67%	252 087	2,3%	0,3%	31 770
Norway	2007	3%	50%	67%	263 066	0,7%	0,2%	33 306
Norway	2008	3%	49%	67%	294 278	3,8%	0,2%	34 160
Norway	2009	3%	50%	67%	267 535	2,2%	0,4%	33 249
Norway	2010	4%	50%	67%	283 400	2,4%	0,5%	34 537
Norway	2011	3%	49%	67%	307 472	1,3%	0,4%	35 896
Norway	2012	3%	49%	68%	327 988	0,7%	0,3%	36 857
Norway	2013	4%	49%	68%	340 138	2,1%	0,3%	38 198
Norway	2014	4%	50%	67%	338 506	2,0%	0,4%	39 341
Norway	2015	5%	49%	67%	313 231	2,2%	0,4%	40 493
Spain	2001	11%	17%	76%	937 889	3,6%	1,7%	25 417
Spain	2002	11%	17%	76%	1 009 753	3,1%	1,8%	26 217

Spain	2003	11%	17%	76%	1 055 548	3,0%	1,8%	26 989
Spain	2004	11%	16%	76%	1 121 204	3,0%	1,8%	28 429
Spain	2005	9%	16%	76%	1 205 129	3,4%	1,8%	29 790
Spain	2006	8%	16%	76%	1 362 071	3,5%	1,8%	31 770
Spain	2007	8%	16%	78%	1 466 711	2,8%	1,7%	33 306
Spain	2008	11%	18%	78%	1 528 584	4,1%	2,2%	34 160
Spain	2009	18%	18%	77%	1 488 993	-0,3%	3,4%	33 249
Spain	2010	20%	18%	79%	1 476 809	1,8%	3,0%	34 537
Spain	2011	21%	18%	79%	1 489 595	3,2%	3,4%	35 896
Spain	2012	25%	18%	79%	1 483 647	2,4%	3,3%	36 857
Spain	2013	26%	18%	78%	1 512 074	1,4%	3,1%	38 198
Spain	2014	24%	17%	78%	1 558 307	-0,2%	2,5%	39 341
Spain	2015	22%	15%	77%	1 621 070	-0,5%	2,0%	40 493
Sweden	2001	6%	78%	82%	266 350	2,4%	1,0%	25 417
Sweden	2002	6%	77%	82%	276 018	2,2%	1,0%	26 217
Sweden	2003	7%	78%	82%	284 711	1,9%	1,1%	26 989
Sweden	2004	7%	76%	82%	304 256	0,4%	1,2%	28 429
Sweden	2005	8%	76%	82%	309 213	0,5%	1,1%	29 790
Sweden	2006	7%	74%	82%	342 151	1,4%	0,9%	31 770
Sweden	2007	6%	71%	76%	373 750	2,2%	0,6%	33 306
Sweden	2008	6%	68%	72%	388 684	3,4%	0,4%	34 160
Sweden	2009	8%	68%	69%	374 815	-0,5%	0,7%	33 249
Sweden	2010	9%	68%	68%	396 284	1,2%	0,6%	34 537
Sweden	2011	8%	68%	66%	421 516	3,0%	0,4%	35 896
Sweden	2012	8%	68%	64%	432 488	0,9%	0,4%	36 857
Sweden	2013	8%	68%	63%	444 617	0,0%	0,5%	38 198
Sweden	2014	8%	67%	61%	457 508	-0,2%	0,4%	39 341
Sweden	2015	7%	67%	60%	481 171	0,0%	0,3%	40 493
United Kingdom	2001	5%	29%	20%	1 639 407	1,6%	0,4%	25 417

United Kingdom	2002	5%	29%	20%	1 721 570	1,5%	0,3%	26 217
United Kingdom	2003	5%	29%	20%	1 803 324	1,4%	0,2%	26 989
United Kingdom	2004	5%	28%	19%	1 913 772	1,4%	0,2%	28 429
United Kingdom	2005	5%	27%	19%	1 968 627	2,1%	0,2%	29 790
United Kingdom	2006	5%	27%	19%	2 108 799	2,5%	0,2%	31 770
United Kingdom	2007	5%	27%	18%	2 177 277	2,4%	0,2%	33 306
United Kingdom	2008	6%	27%	18%	2 264 898	3,5%	0,3%	34 160
United Kingdom	2009	8%	27%	19%	2 182 383	2,0%	0,4%	33 249
United Kingdom	2010	8%	27%	19%	2 288 743	2,5%	0,4%	34 537
United Kingdom	2011	8%	27%	20%	2 351 301	3,8%	0,4%	35 896
United Kingdom	2012	8%	26%	20%	2 439 691	2,6%	0,4%	36 857
United Kingdom	2013	8%	25%	20%	2 560 721	2,3%	0,3%	38 198
United Kingdom	2014	6%	25%	20%	2 667 371	1,5%	0,2%	39 341
United Kingdom	2015	5%	24%	20%	2 771 840	0,4%	0,2%	40 493
United States	2001	5%	13%	62%	10 581 822	2,8%	0,3%	25 417
United States	2002	6%	13%	62%	10 936 418	1,6%	0,5%	26 217
United States	2003	6%	12%	62%	11 458 246	2,3%	0,5%	26 989
United States	2004	6%	12%	62%	12 213 730	2,7%	0,4%	28 429
United States	2005	5%	12%	62%	13 036 637	3,4%	0,3%	29 790
United States	2006	5%	12%	62%	13 814 609	3,2%	0,2%	31 770
United States	2007	5%	12%	62%	14 451 860	2,9%	0,2%	33 306
United States	2008	6%	12%	63%	14 712 845	3,8%	0,3%	34 160
United States	2009	9%	12%	61%	14 448 932	-0,4%	0,8%	33 249
United States	2010	10%	11%	61%	14 992 052	1,6%	1,1%	34 537
United States	2011	9%	11%	61%	15 542 582	3,2%	0,7%	35 896
United States	2012	8%	11%	61%	16 197 007	2,1%	0,6%	36 857
United States	2013	7%	11%	62%	16 784 851	1,5%	0,4%	38 198
United States	2014	6%	11%	62%	17 527 258	1,6%	0,2%	39 341
United States	2015	5%	11%	62%	18 238 301	0,1%	0,2%	40 493

Table 10, data for regression analysis

Sources:

Unemployment rate: (OECD, 2021g)

Unemployment benefits: (OECD, 2021a)

Trade union density: (OECD, 2021f)

Inflation: (OECD, 2021d)

GDP: (OECD, 2021b)

Public unemployment spending: (OECD, 2021e)

GDP per capita for the whole OECD: (OECD, 2021b)

Appendix B

Tables 11 to 13 depicts the data used in event study for test 1 to 3. The grey shaded areas depict the periods we compare in our event studies. The white areas depict the event periods.

Data Unemployment rate Sweden

The unemployment rate in Sweden	
Date	Unemployment rate
2019-12	6,7%
2020-01	7,2%
2020-02	7,5%
2020-03	6,8%
2020-04	7,9%
2020-05	8,4%
2020-06	9,2%

Table 11, data for the unemployment rate, used in test 1

Source: (OECD, 2021g)

Data Average working hours per week and worker

Average working hours per week and worker			
Date	Total worked hours per week	Employed	Average working hours per week and per worker
2019-12-01	153 200 000	5 149 400	29,75
2020-01-01	153 800 000	5 139 300	29,93
2020-02-01	156 000 000	5 137 700	30,36
2020-03-01	148 200 000	5 088 900	29,12
2020-04-01	139 100 000	5 047 500	27,56
2020-05-01	140 600 000	5 053 500	27,82
2020-06-01	143 500 000	4 996 600	28,72

Table 12, data for average working hours per week and worker, used in test 2

We divide the total weekly hours worked by the total amount of employees to calculate the average working hours per week and per worker

Source: (Statistiska Centralbyrån, 2021c)

Data Total weekly working hours, industry-specific

Total weekly working hours, industry-specific								
Date	Commerce	Financial activities and business services	Hotels and Restaurants	Health and social care	Manufacturing and extraction, energy and the environment	Manufacturing of engineering goods	Transport	Public Administration
19-Dec	14,8	23	3,7	5	17,7	8	7,1	10,4
20-Jan	14,1	21	3,4	5	18,3	9	8,3	11
20-Feb	15,3	23	3,8	5	18,5	9	8	11,4
20-Mar	14,1	23	3,1	5	16,9	8	6,8	11,2
20-Apr	13,3	20	1,8	4	15,6	7	7,1	10,8
20-May	13	21	2	4	15,8	7	7,2	10,9
20-Jun	13,2	22	2,2	6	15,8	7	5,7	11

Table 13, data for total weekly working hours, used in test 3

Source: (Statistiska Centralbyrån, 2021c)