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## **Preface**

This research is written as a part of a master's degree at the University of Stavanger. Over the course of our master's degree, during difficult times in a pandemic, we felt a thesis about COVID-19 would be a relevant and important topic for us. Reflecting on the events that have occurred and what the future will look like for our economy has been rewarding and given us perspective. Economic policy has been at the forefront of economic recovery and has an explicit effect on our day-to-day lives. Therefore we felt the need to dive into its consequences for Norway, both during the pandemic and the implication for our future.

We want to thank Dengjun Zhang for his guidance and family & friends for moral support through a challenging time.

## **Executive summary**

This paper discusses the impact of COVID-19 on the Norwegian economy in the short, medium, and long term. Moreover, it will discuss and analyze the economic policy response and its effects. In addition, we will look at Norway in comparison with the rest of the world, primarily other OECD countries.

The motivation for this is gaining perspective for the unique situation we are in and how it may affect the future. COVID-19 affects day-to-day lives unlike any previous recessions in modern times, and while most countries have taken on debt, Norway can fall back on transfers from the Government Pension Fund Global. Therefore, it is highly relevant to look closer at how the pandemic impacted the Norwegian economy and discuss how economic policy handled the turbulence. For this purpose, we will discuss the impact and economic policy response from the first quarter of 2020 until the end of the first quarter of 2021.

We will primarily look at how the real economic variables were hit when analyzing the impact. The real economic variables involve the variables that affect Norway's GDP in aggregate form. We will also discuss potential long-term consequences as a result of the pandemic. To do so, we will look at consequences for long-term trend growth on output and regulations of the economic framework. By this, we mean covering the most important factors of the Norwegian economy. This will lay a good foundation to clarify and discuss the economic-political response. In that way, we will cover monetary policy, fiscal policy, and the interaction between them.

The basis for the economic policy framework is established in chapter 2. We provide the theory that is used for discussing and analyzing the economic response here. For monetary policy, Norges Bank's flexible inflation targeting is used as a basis. This involves Norges Bank stabilizing inflation near the target in the medium term. Flexible inflation targeting implies that the central bank weighs stable inflation against the developments in output and demand. A model established by Røisland and Sveen (2018) will be used for the monetary policy analysis.

When it comes to fiscal policy, Norway is in a unique position due to the oil fund. The usage of oil revenues and fiscal policy's influence on aggregate output is crucial for this part of the paper.

Moreover, the potential effects of increased public spending are covered. Lastly, the chapter covers the interaction between fiscal and monetary policy.

Chapter 3 starts with a presentation of how the impact and responses of COVID-19 around the world were. Further, we cover how the world's economies are connected and how it affects Norway. The chapter continues and ends with data and economic responses from the real economy, inflation, the labor market, and the foreign exchange market.

In chapter 4, we discuss and analyze the economic policy response. We cover Norges Bank's assessments and its rate decisions from the first quarter of 2020 until the first quarter of 2021. Further, we assess this against the model we established in chapter 2 and compare this to other OECD countries. Additionally, we discuss how the credit market was impacted.

In the next part of the chapter, we discuss the role of fiscal policy during the pandemic and which long-term consequences it faces. We then discuss how the balance between monetary- and fiscal policy is crucial and how the roles have changed since the financial crisis. We end the chapter with a discussion of the long-term development and structural changes.

Finally, chapter 5 concludes the paper.

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# 1. Introduction

At the beginning of the 2020s, the general news is influenced by the global spread of the coronavirus and the uncertainty it brings. The Government implemented the most "intrusive measures in peacetime," which was the start of an economic crisis unlike any other. No previous crises have given us quick and deep slumps of the same magnitude. On the other hand, no other crises have given us as quick recoveries as in the pandemic.

The pandemic will remain as memorable years in history. The generations that experienced this pandemic will be able to refer to this time like previous generations remembered the war, the depression, or the Spanish flu. The Corona crisis is primarily about life, suffering, and public health. Still, in the battle against infection, the opportunities for social life and income from work and other economic activities are reduced.

Monetary policy is seen as a first-line defense in stabilizing the economy, and Norges Bank had to act quickly. However, the unusual combination of demand and supply shocks that COVID-19 brought made the situation unique. Contrary to previous crises, the room for maneuver was more limited due to an already low policy rate heading into the crisis. The pandemic was characterized by unusually high uncertainty of the economic outlook. The development depended on the course of the pandemic and the length of the containment measures. Norway's central bank primarily focused on helping companies and households through a rough time, but the pandemic has shifted more responsibility towards fiscal policy than previously.

Fiscal policy shifted a majority of the immediate economic losses towards the Government. Far-reaching temporary support schemes and the ordinary income security from the welfare state led to historically high growth in expenses. The reduction in revenues was even more prominent, especially tied to the reduced petroleum taxes, but also as a result of significantly subdued taxes from the mainland economy. Consequently, the reduction in national revenues fell on the Government. This has been financed by withdrawals from the pension fund that exceeds the three-percent rule of the budgetary rule.

The extra usage of oil revenues must be assessed against the gain of it. The value of avoiding long-term unemployment is significant, both for socioeconomics and for the individuals affected.

Although several employees, regardless of COVID-related support schemes, would have been employed again when the demand recovered, some would, from experience, have troubles returning to the labor market again. Extra usage of oil revenues in crises and recessions is in line with the budgetary rule but requires a return to the three-percent path when the crisis is over. When the pandemic is over, a long period of limitations on how we use our money, how we move, and how we work will remain. The pandemic will leave deep and lasting scars.



## 2. Methodology

This chapter discusses the methods we use to discuss the impact and response in the Norwegian economy during COVID-19. Our theory chapter consists of quantitative data, applying widely accepted mathematical and economic theory methods to analysis and measurements. Overall, we base the method on trend-cycle data, studying the monetary and fiscal development and assessments of the economic policy in light of our theory section.

An assessment of reliability and validity is crucial to evaluate the quality of the research. Reliability assesses whether the data is consistent, that it is measured "right," and how likely it is that we would have gotten the same result if we measured it again (Svartdal, 2020). Validity discusses the accuracy of a measure (Dahlum, 2020).

Most of our data is collected from acknowledged agents, primarily the central bank of Norway (Norges Bank), Statistics Norway (SSB), and the Government (Regjeringen). This gives us confidence that the measurements are undertaken satisfactorily. Some of the data are pure observations, making measurement errors difficult, i.e., the policy rate. However, there are some uncertainties in our data.

GDP numbers are adjusted long after the estimates, which means that the numbers for the recent years are preliminary estimates. This makes the risk for measurement errors more significant for new numbers, and as a result, lower reliability. Moreover, there is uncertainty tied to inflation, as these numbers are based on collection from numerous sources (Statistics Norway, 2021a). Based on international studies, Statistics Norway suggests that the room for measurement error lies between 0.4 and 1.1 percent. This paper has primarily focused on CPI-ATE (consumer price index adjusted for tax changes and excluding energy products) numbers from Norges Bank's monetary policy reports for underlying inflation.

When it comes to validity, it is our opinion that most data measures what we want them to accurately. However, the indicator for inflation is arguable. We chose to look at CPI-ATE, but certain aspects of the inflation developments are not collected by choosing this indicator. For instance, average inflation is closer to the target for the period overall if one decides to look at CPI rather than CPI-ATE. Nonetheless, we feel that CPI-ATE is the correct indicator to study.

This is based on, among other things, the regulation on monetary policy established in 2001. The regulation says changes in consumer prices due to "changes in the interest rate level, indirect and direct taxes and certain temporary disturbances (Meld. St. 2, 2000-2001)."

# 3. Theory

## 3.1 Business cycle theory

The output gap is a term used to describe the difference between actual output and potential output in an economy. It can be either positive or negative and can be expressed as:

$$(3.1) \quad (Y_f - Y_t)$$

A positive output gap suggests that the actual output is higher than the full capacity output. In this case ( $Y_f > Y_t$ ), and is a result of high demand and businesses operating far above their efficient capacity. Conversely, a negative output gap suggests that the actual output is less than what the economy could produce at its most efficient capacity. In this case ( $Y_f < Y_t$ ), there is spare capacity in the economy due to low demand. As a result, stabilizing actual output around potential output and closing the output gap is a goal for every economy.

Breaking down aggregate output into a trend component and a cycle component allows us to assess cyclical fluctuations. This can be expressed as:

$$(3.2) \quad Y_t = T_t + C_t,$$

where  $Y_t$  is aggregate output,  $T_t$  is the trend component, and  $C_t$  is the cycle component. Small  $t$  defines time.

The trend component captures the long-term growth rate in the economy and defines the level of potential output at time  $t$ . The supply-side decides this trend in the economy through a product function, and as a result, the capacity in an economy (Balke, 1991). The production function can be written as:

$$(3.12) \quad Y = AL^\alpha K^\beta, \quad \text{where } \delta L > 0, \delta K > 0 \text{ and } \delta A > 0$$

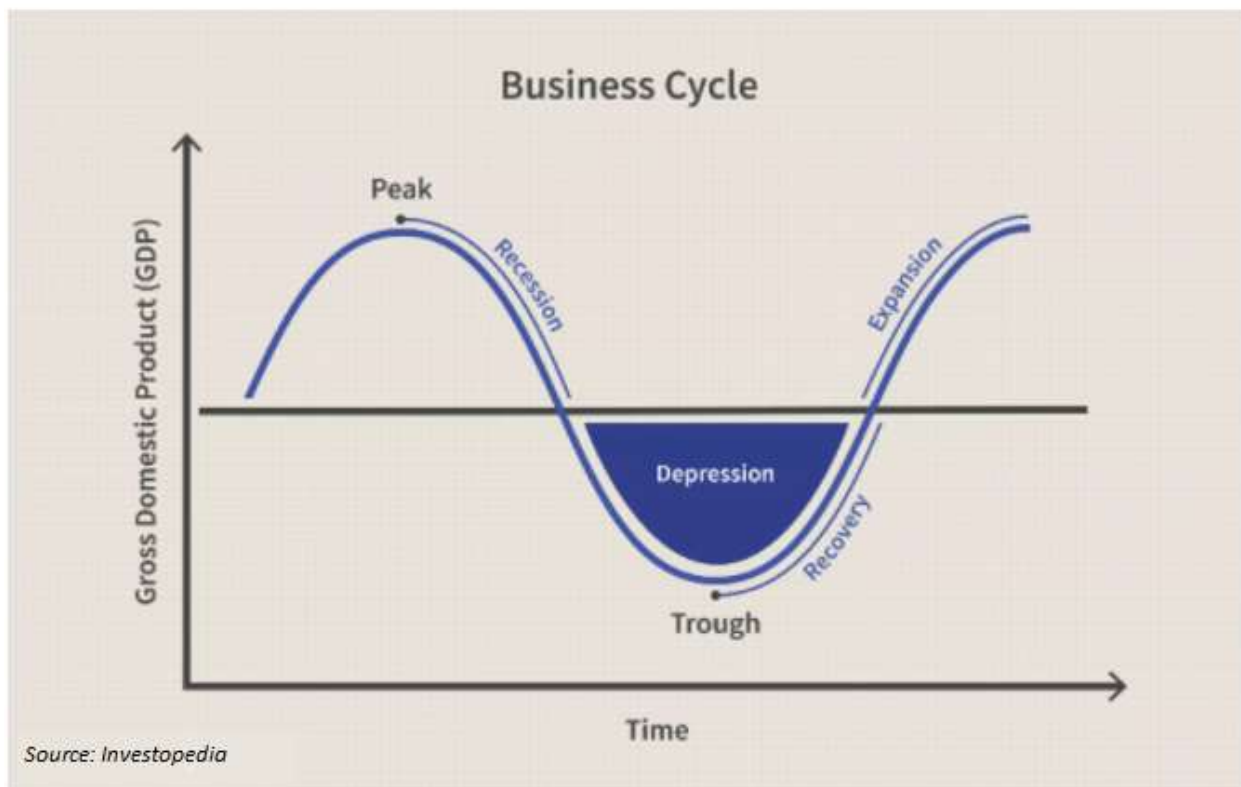
The product function is expressed as a Cobb-Douglas function where  $A$  is factor productivity,  $L$  is labor, and  $K$  is real capital.  $\alpha$  and  $\beta$  denote elasticity, thereby showing the percentage-wise increase in  $Y$  due to an increase in  $A$  or  $K$  of one percent. Therefore, a positive but decreasing relationship between output and increased access to input factors is assumed. Additionally,

increased productivity will increase output. This decides the growth in the economy, and as a result, long-term potential output.

The cycle component captures temporary fluctuations from the long-term trend. In other words, it shows fluctuations in actual output around the trend in a given period. The demand-side decides the actual output in the economy through private and public demand for consumption and investment (Balke, 1991).

Finally, cyclical fluctuations can be illustrated in the business cycle below. As shown, recessions start at the peak of the business cycle, when an expansion ends. The end of a recession is at the trough of the business cycle when the next expansion begins. Sørensen et al. (2005) define a recession or a boom as when the deviation between actual and potential output has lasted over five quarters.

Chart 1: The phases of the business cycle



### **3.1.1 Keynesian theory**

John Maynard Keynes is one of the most well-known economists in our history. His economic theory developed in the 1930s has been widely the most used economic model in recent times, especially during the 1970s. Keynesian theory aims to stabilize business cycles with a focus on the demand side of the economy. Furthermore, the theory assumes available capacity in the economy, which implies availability in both output and unemployment capacity. An implication of this is that the supply curve is flat due to changes in demand not pressuring the economy's capacity. Additionally, this leads to the price level assumed to be constant in an attempt to stabilize a shock without it leading to undesired inflation (Persson, 1989). Assuming a shock occurred, this would stem from the cycle component and would not lead to a change in growth or the level of the trend component. The general consensus during this time was that a shock could be stabilized with the use of active finance and monetary policy. This would ultimately lead to the shock being neutralized, and that real production would move towards the constant trend growth.

Furthermore, this implies that there is no future inflation expected, and nominal salary remains constant over time (Persson, 1989). The thought process behind this is that the trend in production remains constant over time.

Keynes' theory has received criticism for different reasons. One criticism is from supply-side economists believing that the supply boosts business growth and not demand. Another is from proponents of the trickle-down theory. This implies that fiscal policy should aim to benefit the wealthy, which in turn will trickle down to everyone. A third criticism comes from monetarists who believe that monetary policy will drive the business cycle. Finally, we have socialists that believe that the Government should play a more active role in its finance and monetary policies.

### **3.1.2 New Keynesian theory**

In the 1970s, the economy experienced economic growth. This was in large part due to the oil-price shock in 1973. The result of this led to increased inflation, unemployment, and slower economic growth. As mentioned in our previous section, a criticism of Keynes' theory was its

heavy focus on the demand side. Macro-economists were now more focused on the supply-side of the economy (Carlin & Soskice, 1990).

A challenge that presented itself was the presence of a connection between demand stabilizing measures and the level of inflation. Aggregated demand regulations were found to have not only an impact on the economy's activity level but also price growth. The presumption from this was that the supply curve was rising short-term.

Building on Keynes' theory, an important new assumption was the implementation of rational expectations. This means that there are no systematic wrongs in market participants' prognosis regarding future prices and salaries. Instead, differences in expected and actual market outcomes are found in one random flaw. Another assumption is that all market participants have access to the economy's macroeconomic equation. The result of these assumptions is that the market will have a natural long-term level of unemployment. Any attempt to change this level of unemployment will lead to increased prices and salaries.

New Keynesian theory assumes that nominal prices and salaries are stiff. Short-term, nominal prices and salaries will see no changes if macroeconomic conditions change. The central bank will still affect the macroeconomic variables short term because changes in nominal interest rates are presumed to impact real interest rates. A key difference from Keynesian theory is that nominal interest rates directly connect with actual inflation, which means that emphasis on active use of monetary policies has a crucial role in stabilizing the economy.

### **3.2 Monetary policy**

Over the years, monetary policy has become increasingly important for macroeconomic stabilization policy at fiscal policy expense. Inflation targeting as a monetary policy framework has proved to be more resilient in turbulent environments, such as the international financial crisis (Meld. St. 8, 2017-2018). Even though several countries have adopted inflation targeting, most macroeconomic textbooks use economic models that are poorly suited to analyze monetary policy under inflation targeting. This section aims to explain monetary policy and flexible inflation targeting using an economic model presented by Røisland and Sveen

(2018). The model consists of a demand-side represented by an IS-curve, a supply-side represented by a Phillips-curve, and a loss function, which the central bank wishes to minimize through monetary policy.

### **3.2.1 Transmission mechanisms**

Monetary policy affects the economy through several channels, referred to as the transmission mechanism of monetary policy. This paper will focus on a small open economy, which is what Norway's economy is. When the central bank changes its policy rate, it influences activity levels across the whole economy and thereby inflation. With the assumption of price rigidity, a change in the nominal interest rate will directly affect and change the real interest rate. An increase in the nominal interest rate leads to a rise in the real interest rate, and a lower level on the nominal interest rate leads to a lower real interest rate.

Furthermore, a change in the nominal interest rate affects the exchange rate. An increase in the interest rate will lead to an appreciation, and a decrease will lead to a depreciation of the Norwegian krone. Moreover, this will affect the real rate of inflation and aggregate demand through several channels. We will look at the demand channel, the exchange rate channel, and the expectations channel in the next sections.

#### **3.2.1.1 The demand channel**

When interest rate levels rise, households and firms have less money for consumption and investment. If interest levels rise, it becomes more expensive to loan, which makes saving more attractive. Household consumption will fall, and businesses will reduce their investments. Therefore, aggregate demand for goods and services falls. This may lead to lower output and employment, as firms reduce their production and need fewer employees. With monopoly power, firms can hire employees at a lower wage than usual and resist the pressure to raise wages. As a result, this may cause low wage growth.

### **3.2.1.2 The foreign exchange channel**

In a small open economy, the foreign real exchange rates are assumed constant and exogenous. When the central bank increases its interest rate, the real interest rate differential between Norway and countries abroad increases as long as other countries' rates remain unchanged. This will lead to fewer loans, and demand for NOK may increase. In most cases, this causes currency appreciation. Consequently, imported goods become cheaper. Simultaneously, exports from Norway become more expensive in foreign currency due to the appreciation. Firms that rely on exports abroad will experience a fall in earnings. Thus, demand for domestically produced goods is reduced - as they are relatively more expensive than imported goods.

### **3.2.1.3 The expectations channel**

Inflation expectations play an essential role in price determination and wage negotiation. An increase in interest rates creates an expectation of a lower wage- and price increase. Firms use these market estimates to set prices for their goods and services. Similarly, the expectations of future inflation are of importance in wage negotiations. When the social partners in Norway negotiate wages, employees will aim to increase their purchasing power. If prices are expected to rise, employees will generally demand higher wage increases than if they were to expect low inflation. Inflation expectations will be explicitly included in the model we will present in the following section, which assumes rational expectations - similar to the new-Keynesian theory.

## **3.2.2 Flexible inflation targeting**

This paper will focus on inflation targeting in a small open economy such as Norway. A small open economy implies that the country's policy does not alter world prices, interest rates, or incomes. It also implies that domestically produced goods and services will be used for both consumption and investment, then exported and sold abroad to foreign households and firms. Moreover, domestic firms face international competition on the local market from imports. Flexible inflation targeting means that rather than stabilizing only inflation, it also stabilizes the



real economy. Lastly, assumptions made about transmission mechanisms and optimal monetary policy will apply in the upcoming section.

### **3.2.2.1 Financial stability**

Norges Bank defines financial stability as "a financial system that is resilient to shocks and thus capable of channeling funds, executing payments and distributing risk efficiently" (Norges Bank 2020a). In other words, the economic ability to handle shocks is reduced if financial stability is absent. Therefore, among other things, loss of financial stability is a major part of Minsky's and Kindleberger's theories for financial crises (Grytten and Hunnes, 2016).

A build-up of financial balances typically happens in times where credit and asset prices thrive (Norges Bank, 2007). This involves the population getting a higher level of debt and that the prices on stocks, houses, and other asset objects grow quickly. An example of this is the period leading up to the financial crisis in 2008, which was affected by increasing asset prices and a continuously increasing loan-to-value ratio (Notaker, 2020). The household debt ratio also forms part of this and is often correlated with house price development.

A challenge with studying the development in financial stability is that there does not exist a uniform quantitative indicator for the concept (Schinasi, 2004). This is tied to financial stability being complex and is based on several more factors. For instance, it is hard to measure a financial institution's efficiency and how well-functioning the payment system in society is. Moreover, it is hard to estimate financial stability because it often rests on external disturbances that we do not know the probability for. As a result, to assess the outlook for financial stability, we concentrate on paying attention to the development of the variables that we know affect financial stability. For Norway, following the debt development in households and housing prices is highly relevant.

### 3.2.2.2 Aggregate demand (IS-curve)

The following equation is an expanded IS-curve that takes into account how the exchange rate affects the level of activity:

$$(3.3) \quad y = y^* - \alpha_1(i - \pi^e - r^*) + \alpha_2(e - e^*) + v,$$

where  $y$  is aggregate production and  $y^*$  is potential production. As a result, the expression  $(y - y^*)$  represents the output gap. Furthermore,  $i$  denotes the nominal interest rate,  $\pi^e$  is expected inflation, and  $r^*$  the long-term equilibrium real interest rate. Therefore, the real interest rate is defined as  $(i - \pi^e)$ . Finally,  $\alpha_1$  weighs the difference between the real interest rate and the long-term equilibrium level for the real interest rate.

As seen in equation 3.4, a higher real interest rate relative to the equilibrium real interest rate will lower aggregate demand. There are several potential reasons for this, i.e., a higher interest rate is an incentive to save, and households with reduced earnings and high debt. An increased interest rate will also lead to reduced house prices and, as a result, reduced housing wealth and access to credit.

The real exchange rate is expressed as  $e = s + \pi^f - \pi$ ,

where  $e = s + p^* - p$  is the logarithm of the real exchange rate (exchange rate adjusted for price differences abroad and domestically),  $s$  denotes the logarithm of the nominal exchange rate (an increased value represents a weaker currency, i.e., a depreciation),  $p^*$  is the logarithm of the price of foreign goods measured in foreign currency, and  $p$  is the price of domestically produced goods. It is worth noting that an increase in  $e$  or  $s$  implies a depreciation of the exchange rate. Moreover,  $\alpha_2 (e - e^*)$  includes the effect of the exchange rate, where  $e^*$  is the equilibrium real exchange rate. Changes in the exchange rate will affect aggregate demand through the exchange channel, which was mentioned previously. For simplicity, it is assumed that the purchasing power parity holds in the long run, and hence the long-run real exchange rate is one. An increase in  $e$  (depreciation of the real exchange rate) will, in a vacuum, make domestically produced goods and services cheaper relative to foreign goods and therefore increase aggregate production.

Finally,  $v$  represents demand shocks that can arise through unexpected fiscal policy changes, international business cycles, household saving behavior, or changes in firms' investments. A positive demand shock will increase aggregate production.

### 3.2.2.3 Aggregate supply

A Phillips-curve represents the supply side:

$$(3.4) \quad \pi = \pi^e + \gamma(y - y^*) + \beta(e - e^*) + \mu$$

Where  $\mu$  represents inflation shocks such as an unexpected rise in crude materials prices or wages.

The Phillips curve builds on the new-Keynesian theory and assumes price and wage rigidity in the short- and mid-term. This means that demand pressures result in gradual increases in prices. Other things held constant, a rise in inflation expectations feeds through fully to an increase in actual inflation. This implies that  $\pi = \pi^e, y = y^*$  and  $\mu = 0$  in the long term.

With this in mind, the long-term Phillips curve becomes a vertical line, meaning there can be no trade-off between inflation and unemployment.

A positive output gap is typically referred to as a boom. High aggregate demand allows higher earnings for businesses through a price increase. A boom naturally pressures the economy's capacity, leading to higher costs for firms through a higher price level relative to the input factors. Furthermore, a boom typically brings low unemployment and pressure in the labor market. As a consequence, increased earning levels lead to firms increasing their prices on goods and services. Both of these effects lead towards increased inflation.

The exchange rate term is part of the equation in an open economy. A change in the real exchange rate affects inflation through the exchange rate channel. There are several reasons why a weaker real exchange rate leads to higher inflation. First, a relatively weak real exchange rate improves competitiveness and therefore increases activity levels, which pressures prices and wages. Secondly, a weaker real exchange rate leads to imported production factors becoming

more expensive, and the increased cost of production is partially pushed over to the prices. Lastly, a weaker exchange rate makes imports more expensive, increasing the consumer price index due to higher imported inflation.

### 3.2.2.4 The exchange rate and uncovered interest rate parity

Finally, to determine the real exchange rate, we use an equation based on uncovered interest rate parity:

$$(3.5) \quad s = s^e - (i - i^f) + z,$$

where  $s^e$  denotes the expected nominal exchange rate for the next period,  $i^f$  the foreign interest rate and  $z$  is a currency rate shock (risk premium shock). Uncovered interest rate parity states that the expected return should be the same in different currencies. The shock variable  $z$  represents a deviation from uncovered interest rate parity. If the domestic yield is higher than the foreign yield, a positive shock occurs.

### 3.3 The loss function

During the 1990s, the Norwegian Government realized that the exchange rate management was no longer sufficient. Consequently, central banks were assigned to maintain low and stable inflation rates. Central banks employ an objective function to evaluate macroeconomic policies. The function is a loss function and is used to minimize loss given the description of the economy's condition. Furthermore, an important factor in the model is the gap between potential and actual production. A loss function can look like this:

$$(3.6) \quad L = \frac{1}{2} [(\pi - \pi^*)^2 + \lambda(y - y^*)^2]$$

The loss function argues that a deviation in either positive or negative direction is equally costly. In addition to this, the loss will increase in alignment with the deviation exponentially.

Parameter  $\lambda$  indicates the central bank's weighting of production stability in accordance with the stability of inflation. If the parameter  $\lambda$  is greater than 0, it indicates that the central bank's objective rule is flexible inflation management. A considerably higher value of the parameter  $\lambda$  implies that stability in the real economy is more important, with the main focus to keep inflation stable. A result of this is that the central bank may use a longer time in order to realize the inflation target.

As this thesis focuses on Norway, it would be natural to include the time horizon of reaching the inflation target. Norway's time horizon has previously aimed to reach the inflation target in 1-3 years, depending on what kind of shocks occur and the size of the shocks. The time horizon today is more flexible, focusing on "stabilizing inflation near the target medium-term."

### 3.3.1 The first-order condition for minimizing the loss function

As the central bank's objective is to minimize the loss function by setting a key interest rate, we derive the loss function with respect to the nominal rate and set the expression equals to zero. We then get a mathematical expression for the first-order condition for minimizing the loss function:

$$(3.7) \quad \frac{\delta L}{\delta i} = \frac{1}{2}(2(\pi - \pi^*) \frac{\delta \pi}{\delta i} + \lambda 2(y - y^*) \frac{\delta y}{\delta i}) = 0$$

As a result of deriving the loss function, we conclude that the supply curve and the demand curve with respect to the nominal rate are included in the expression. Separate expressions for these are:

Demand-curve derived with respect to the nominal rate:

$$(3.8) \quad \frac{\delta y}{\delta i} = -\alpha_1 + \alpha_2 \left( \frac{\delta e}{\delta i} \right) = -(\alpha_1 + \alpha_2), \quad \text{where } \frac{\delta e}{\delta i} = \frac{\delta s}{\delta i} = -1$$

Phillips-curve derived with respect to the nominal rate:

$$(3.9) \quad \frac{\delta \pi}{\delta i} = \gamma \frac{\delta y}{\delta i} = \gamma(-1)(\alpha_1 + \alpha_2) + \beta(-1) = -[\gamma(\alpha_1 + \alpha_2) + \beta]$$

Some noteworthy observations are that equations (3.18) and (3.19) summarize the economy's transmission mechanisms. Equation (3.18) illustrates how  $Y$  reacts to a marginal change in the interest rate level, while equation (3.19) illustrates how inflation changes after a marginal change in the interest rate. We connect the expressions for the derivative of demand and supply into our condition for optimal interest rate setting:

$$(3.10) \quad (\pi - \pi^*)(-\gamma(\alpha_1 + \alpha_2) + \beta) = -\gamma(-)(\alpha_1 + \alpha_2)(y - y^*)$$

This can then be simplified as:

$$(3.11) \quad (\pi - \pi^*) = -[\lambda \frac{(\alpha_1 + \alpha_2)}{\gamma(\alpha_1 + \alpha_2)} + \beta](y - y^*)$$

Equation (3.11) implies that the monetary policy only is optimal if both gaps are closed. If this is not the case, it will only be optimal if there is a negative relationship between the gaps. In this situation, Central Banks must decide between prioritizing price stability versus stability in the real economy. The decision depends on the size of parameter  $\lambda$  and implicitly the Central Bank's time horizon on reaching the inflation goal.

Given equation (3.11), it is sub-optimal that the output gap and inflation gap are either positive or negative concurrently. The reasoning for this is that the gaps can be closed using a key interest rate. An example is the Central Bank reducing the policy rate as the optimal response to negative gaps. This will lead to increased inflation and output, which will increase the gap and reduce the loss.

### 3.3.2 The loss function expanded to counteract financial imbalances

Financial imbalances have become a consideration in monetary policy. Although some argue that benefits do not outweigh the costs (Svensson, 2017), financial imbalances are still a consideration the Norwegian Central Bank takes into account when deciding the policy rate. Consequently, the loss function has included the variable  $q$ , including asset prices, credit and debt ratio. The variable measures deviations from an equilibrium of 0 assuming no shocks

and is expressed as the financial gap. Extending the central bank's loss function gives us the following equation:

$$(3.12) \quad L = \frac{1}{2} [(\pi - \pi^*)^2 + \lambda y^2 + \delta q^2]$$

$\lambda$  is the weighted financial gap. Credit growth has been shown to be a significant predictor of financial crises (Schularick and Taylor, 2012). Additionally, the cost of a crisis can have a wider impact beyond inflation and the output gap. A financial turmoil can lead to profitable investment opportunities not being financed. High credit growth during expansions usually leads to long-lasting recessions. If the variable is too low, it will make it harder for firms to finance investments due to their collateral becoming too low. Therefore, it may be in the central bank's best interest to consider the variable in their policy rating decisions.

### 3.3.3 The financial gap dependent on macroeconomic variables

The financial gap depends on macroeconomic variables. We assume real interest rates influence the financial gap, where it increases when real interest rates fall. The financial gap is as follows:

$$(3.13) \quad q = -\phi(r - p) + w,$$

where  $w$  is the "financial shock," which is a change in the financial variable and unrelated to changes in the real interest rate. Some authors argue that financial cycles do not correspond to business cycles (Borio, 2012). As such, in this model, these cycles are captured as changes in  $w$ .

### 3.4 Rule for optimal monetary policy

We can now express a rule for optimal monetary policy in the form of a simple rule. For example, by inserting the equations for demand and supply into equation (3.11), we get:

$$(3.14) \quad i = r^* + \pi^e + \frac{(\alpha_1 + \alpha_2)\gamma + \beta}{(\alpha_1 + \alpha_2)\alpha_1\lambda} (\pi - \pi^*) + \frac{\alpha_2}{\alpha_1} (e - e^*) + \left(\frac{1}{\alpha_1}\right) + v$$

The equation shows that the Norwegian central bank needs to react to exogenous demand shocks. When a negative demand shock occurs, the demand for goods and services also falls. Ultimately this leads to a reduction in the output gap as well as reduced inflation. Following the rule for the optimal policy rate, the central bank should react by reducing it to minimize the fall in output. The reduction in the real interest rate will lead to a depreciation of the real exchange rate. Subsequently, this is compensated by higher imported inflation. An optimal balance is where the output gap is somewhat lower than the targeted output, and the inflation is somewhat higher than the inflation goal after a negative demand shock.

The inflation expression also contains supply shock. The implication of this is that a positive supply shock leads to a rather high interest rate. Furthermore, the rate-setting after a supply shock is dependent on the size of  $\lambda$ . This is because a supply shock can reduce inflation, even if the activity level in the economy is high. China's entrance into the world economy is a good example of this. The low imported inflation into Norway led to a reduction in the key interest rate. At the same time, Norway found itself in an expanding business cycle, leading to an increased key interest rate.

It is also the central bank's objective to react to an inflation gap different from 0, where a positive gap results in an increased interest rate. Changes in the equilibrium real interest rate affect the Norwegian exchange rate and real economy variables. Therefore, it is also the central bank's objective to react to such changes following the rule for optimal interest rate. If foreign investors lower the required rate of return from securities, a negative risk premium can occur. This can subsequently lead to the value of domestic securities increasing, leading to an appreciation of the domestic currency.

Isolated appreciation will lead to a lower activity level in the economy. This effect stems from foreign products becoming cheaper and domestic products more expensive. A reduction in demand for domestic goods is a consequence of this. Additionally, the lower activity level in the economy will result in lower inflation. To counteract these effects from cheaper imported goods, the key interest rate should be lowered. The conclusion will then be to keep the actual inflation slightly lower than the target, and actual output somewhat higher. These combined will be the optimal solution.



The exchange rate is not directly tied to the loss function. However, the central bank will still consider changes in the exchange rate. The central bank will reduce the key interest rate if the NOK appreciates, while everything else remains equal. In the event of depreciation of the NOK, the opposite will occur. Such a policy contributes to a stable real exchange rate over time. The reason for such a policy is that the exchange rate contributes to keeping inflation and the real economy variables stable.

### 3.4.1 The Taylor Rule

The Taylor Rule was developed by John Taylor in 1993 and was a contribution to the debate of rules versus discretion. It is a simple rule for optimal rate setting. The rule is not followed slavishly but rather used to cross-check the key interest rate.

The foundation of the rule is a mechanical one. Its main point is for the optimal rate to be decided based on historical numbers for the equilibrium real interest rate, actual inflation, inflation gaps, and output gaps. This contrasts with the loss function, which attempts to consider future elements. Formally, the Taylor Rule can be expressed as such:

$$(3.15) \quad i = \pi_{t-1} + \lambda(y - y^*)_{t-1} + (1 - \lambda)(\pi - \pi^*)_{t-1} + r^*$$

According to the Taylor Rule, the rate should be set to keep the rise in prices at a certain level over time. Concurrently, the rate contributes to stabilizing development in output. This theory is in accordance with Røisland and Sveen's theory (2018).

If the inflation and output gap is closed, the Taylor Rule says to put the rate equal to the equilibrium rate plus the inflation from the previous period. This is called a neutral nominal rate (Lønning & Olsen, 2000). Furthermore, if actual inflation surpasses the inflation target, the Taylor Rule will increase the rate to increase the short-term real interest rate. If actual output is higher than potential output, the Taylor rule increases the rate to avoid the economy being overloaded. It is satisfactory that  $\lambda$  is larger than zero so that the increased rate will have a stabilizing effect on the production.

### **3.5 Monetary policy in practice**

Modern monetary policy has shifted its focus towards the new-Keynesian economic theory. This framework is based on the assumption of monetary policy impacting inflation and output through expectations. The central bank can achieve better and faster stability in both inflation and output by influencing market players' expectations. For the central bank communication to impact the market's expectations, the monetary policy must seem credible. Hence, it is favorable for the central bank to show transparency in its reaction pattern. As a result, it will be easier for the market players to confirm that the central bank follows a credible strategy (Dincer, 2007 & Woodfort, 2005). Released forecasts of the interest rate path and understanding the transaction mechanisms will contribute to this.

Norges Bank has been releasing endogenous interest rate paths in their monetary policy reports since 2005. Before this, the central bank assumed constant interest rates or implicitly followed the market interest rates as an exogenous prerequisite. Thus, they took control of their interest rate path forecasts. Leniently, the interest rate path can be seen as an unconditional forecast for the policy rate. Strictly, the forecast is conditional against the central bank's estimate of the current economic situation and its understanding of the transaction mechanisms.

A credible interest rate path implies that the central bank achieves the targeted inflation goal in an established time horizon. This leads to expectations of future inflation matching the inflation target. As seen previously, inflation expectations play a part in the reaction function of the central bank. If inflation expectations deviate from the inflation goal, future interest rate-setting must bear this in mind.

### 3.5.1 Criteria for an optimal interest path

A credible interest rate path follows six criteria according to Qvigstad at Norges Bank (2006):

#### 1. *Anchoring inflation expectations*

The interest rate should be set to stabilize inflation towards the inflation target medium-term.

The time horizon depends on the level of disruption the economy is exposed to and how much it affects inflation and the real economy.

#### 2. *Getting the balance between inflation and output right*

As Norges Bank runs a flexible inflation targeting regime, the chosen interest rate path should involve a reasonable balance between stabilizing inflation towards the inflation target and stabilizing the real economy. What is meant by a "reasonable" balance is a question of discretion and a critical element in the central bank's assessments.

Balancing the main criteria, Norges Bank also considers asset prices such as real estate prices, stock prices, and krone exchange rate. The reason is that these variables may affect output, employment, and inflation.

#### 3. *Robustness*

Interest rate developments should cause acceptable developments for both inflation and output, also under alternative assumptions concerning the economic situation and the economy's functioning. Recent economic theory suggests that the central bank should be more aggressive when setting interest rates during periods of heightened uncertainty. In a situation like this, all other considerations must give way. (Bloom, 2014)

#### 4. *Interest rate smoothing*

Interest rate changes should generally be moderate unless the credibility of the nominal anchor is threatened. Big changes in the policy rate may lead to instability in asset prices and a higher risk for financial instability. As a result, small changes to the interest rate at a time are preferred.

#### 5. *Financial imbalances*

Assessments of interest rate setting in the light of developments in property prices and credit are crucial. Again, significant fluctuations in these variables may lead to instability in demand and output in the longer run.

#### 6. *Cross-checks*

The central bank should cross-check its decisions of the interest rate path against other information. A common way to cross-check is to look at market expectations for the future interest rate. Additionally, if the interest rate deviates from simple rules such as the Taylor rule, there must be plausible explanations for this.

It must be emphasized that the six criteria are not on equal footing, as criterion 1 is of priority. Criteria 2 to 5 are only of interest if they support criterion 1, or at least do not weaken the prospects for price stability. Criterion 6 is different, as it acknowledges that even if the analysis has a foundation in economic theory and advanced tools are used, there is still uncertainty in the measures. Hence, cross-checking our interest rate setting is necessary.

### **3.5.2 Central bank communications**

There has been a clear shift in central banking circles towards greater transparency since the 1990s. Increasing adoption of inflation targeting plays a significant role in this, as it requires heavy communication of policy targets, forecasts, and outlooks. Transparency is essential to create credibility for monetary policy. The central bank should therefore anchor their expectations of future developments in inflation and the real economic variables. To achieve this, they should release their financial situation assessment and their view on the transmission mechanisms.

Furthermore, they should show their reaction pattern. This can be achieved by releasing preferred rules for optimal interest setting. Additionally, explaining monetary policy actions afterward can be seen as a credibility check to see if the central bank's activities follow the announced reaction pattern (Holmsen et al., 2008).

Norges Bank releases their forecasts for CPI (consumer price index), CI (core inflation), output gap, and policy rate in every monetary policy report. The central bank also publishes forecasts for import-weighted exchange rates. Thus, the central bank's view on the developments in the most critical variables in the loss function and the rule for optimal rate setting is public.

### **3.6 Fiscal policy**

It is common to differentiate between automatic stabilizers and discretionary fiscal policy. The former is a type of policy designed to offset fluctuations in a nation's economic activity through their regular operation without additional, timely authorization by the Government or policymakers (Investopedia, 2021). Automatic stabilizers are usually visible through increased consumption of social security schemes in recessions and decreased consumption in booms. Other well-known automatic stabilizers are progressive changes in corporate and personal income taxes due to changes in the workforce and the wage levels during the business cycles. The automatic stabilizers' size is not set with cyclical considerations in mind but rather the progressivity of the tax and transfer system (Taylor, 2000). The automatic stabilizers' size changes over time, but these changes are hardly taken with cyclical considerations in mind.

Fiscal policy impacts aggregate demand through changes in government spending and taxation. Public measures for cyclical stabilization are typically stimulation of aggregate demand through changes in public expenditure and net tax levels (Investopedia, 2021). The relationship between fiscal policy and aggregate output in a small open economy can be written as follows:

$$Y = F(G, T),$$

where aggregate output is a function of  $G$ , public consumption, and  $T$  is a net tax level function. Also,  $\delta G > 0$ , while  $\delta T < 0$ . This means that an increased  $G$  implies increased demand, while increased net tax levels imply reduced aggregate demand.

With the assumption of price rigidity short term, an increase in public consumption or a reduction in net tax levels leads to a temporary increase in aggregate demand. This effect gets neutralized by increased prices from firms and increased pressure from the labor market in the long term. In other words, fiscal policy does not change the long-term trend in output - the effect of expansionary fiscal policy is neutralized over time. However, this opens up for fiscal policy used as a business cycle stabilizer for short-term fluctuations in actual output around the trend (Holden, 2016).

The effect of fiscal policy often comes with a time lag. Implementation and measures typically take a certain amount of time to affect the real economy. An empirical study conducted by Blanchard & Perotti (1999) shows that the effect of the measures comes fully into force in the real economy a few quarters after the implementation. The impact of said measures can last several years but tends to be temporary. Additionally, it can be demanding to reverse these measures if they turn out to be economically unreasonable. As a result, the fiscal measures for stabilizing business cycles become less flexible than the monetary measures. The central bank can adjust the policy rate every six weeks, with changes in the nominal rates the next day.

Monetary policy can stimulate demand through three channels: spending public funds on goods and services, stimulation of the private market, and stimulation of business and industry (Spilimbergo et al., 2008). Spending public funds on measures that stimulate demand is assumed to have a higher multiple-effect than reduced taxes. Consequently, the public should ensure that projects currently underway are maintained. Moreover, the public should make sure that

profitable projects get enough capital to get started. Long-term projects with good prospects are preferable, as these can be maintained through high expectations. Lastly, increased wages for the public will result in new public projects, which leads to reduced unemployment.

A primary objective for fiscal policy should be to keep actual output close to potential output when the inflation is equal to the inflation target. Fiscal policy will also be appropriate to stabilize the real economy if the central bank puts too much emphasis on the inflation gap compared to stabilizing the output gap (Taylor, 2000). If the fiscal policy is too expansionary, actual output will shift to being higher than potential output, leading to increased inflation pressure. Stimulating fiscal policy to this extent will likely lead to reversal measures from the central bank and will by no means stabilize the business cycle.

If recessions last over an extended period, the policy rate is often adjusted to a lower level. When the nominal interest rate is approaching zero, a further reduction in inflation will increase the real rate. As a consequence, a further fall in demand and inflation happens. The shift from falling real rates when the inflation is reduced (for a positive nominal inflation level) to increasing real rates when inflation is reduced (for a nominal rate equal to zero) leads to a breakpoint in the curve for aggregate demand. As a consequence of falling inflation and higher real rates, a downward spiral arises, leading to deflation pressure (Taylor, 2000). When a situation like this occurs, the central bank should maintain a low rate to stimulate fiscal measures. When the policy rate and the nominal rate are approaching zero, the central bank can no longer affect aggregate demand to the same degree. Actual output must therefore be adjusted by fiscal policy (Spilimbergo et al., 2008).

Unlike the central bank, fiscal policy is not politically independent. This leads to the possibility of a time consistency problem. Time inconsistency occurs if political parties perform populist movements right before an election. This implies that government agencies tend to be too expansionary in fiscal policy to maintain power. A tendency like this could stimulate the economy in the wrong direction. A fiscal policy that is too expansionary in a boom will stimulate the demand in the short term but could inflate the economy in the long term.

### 3.6.1 Debt neutrality and Ricardian equivalence

Spilimbergo et al. (2008) argue that the effect of increased public consumption is higher than lower taxes in a recession. Although public purchases of goods and services seem expansionary because it increases public demand, the effect of reduced tax levels is more uncertain. The consensus among researchers is that there are very few macroeconomic models which substantiate that reduced taxes lead to increased consumption and demand. This is due to consumption having an infinite time horizon in these models. An infinite time horizon implies that today's generation considers all the future tax changes when they weigh between saving and consumption in the present moment.

As a result of this, it is easy to imagine a situation where the public seeks to increase private consumption through reduced taxes. This leads to a deficit (lower profit) in the national budget, provided expenses are held constant. The reduction in tax levels will increase disposable income in real-time in a vacuum. On the other hand, a consumer who operates through the permanent income hypothesis will know that the increased public debt will have to be reversed eventually, with increased tax levels sometime in the future as a consequence. As a result, there is a lot of uncertainty about how households will adjust their consumption after tax relief in the middle of a recession (Holden, 2016).

According to Ricardian equivalence theory and debt neutrality, reduced taxes leads to increased savings in a situation like this. The consumer will increase savings to meet the increased tax levels anticipated in the future. This assumes that the consumer has an infinite planning horizon and is altruistic. It also implies that the decision-maker is indifferent between consumption in his time horizon or increased heritage savings. Therefore, increased public debt from reduced tax levels will lead to today's generation increasing savings today to allocate the increased income on consumption over an infinite time horizon. In a situation like this, any market player will attempt to smoothen consumption over an infinite planning horizon (Blinder, 2004).

These results have several assumptions. First, the consumers must save and borrow freely in the credit market with the same interest rate as the public. Second, the number of families must be held constant over an infinite period to prevent families from dying and new ones arising. Moreover, changes in the tax rules cannot shift the consumption between families with different



marginal propensity to consume. Finally, it is assumed that the public can operate at a loss without affecting the political process. Even though these are relatively strict assumptions, a study of the effects of the 2008 financial crisis on European Union nations argues that these premises will be fulfilled at a level that makes the theories about Ricardian equivalence and debt neutrality applicable (Chappelow, 2020).

An interesting implication of Ricardian equivalence and debt neutrality is the possibility that the theories apply to not only the debt perspective but also the fortune perspective. This would have a relatively significant impact on Norway in particular. In a situation like this, the consumers would understand that the public saving will benefit everyone at some point. As a result, the consumer would attempt to smoothen out the profit over an infinite time horizon. If this were the case, it would be possible to see a correlation between increased pension fund growth and increased willingness to borrow. Additionally, it would imply a new connection between increased oil prices and increased consumer demand and house prices.

### **3.6.2 Norwegian fiscal policy and the budgetary rule**

According to Meld. St. 8 (2017-2018, white papers) the economic policy should contribute to stable economic development. Fiscal policy is considered especially important to counteract major disturbances such as the financial crisis and when the oil price fell significantly. For fiscal measures to be effective, they have to be well planned and prepared. The budget process and the implementation of the measures are time-consuming. The use of fiscal policy as cyclical stabilization depends not only on the pension fund size but also on how well Norway utilizes its resources and labor force. Therefore, fiscal policy must also take into account efficiency in the economy. On the other hand, monetary measures can be decided swiftly and work quickly and effectively on the whole economy. As a result, monetary policy is seen as a first-line defense in stabilizing the economy.

Stortinget released new guidelines in 2001 for the usage of the Government Pension Fund Global (GPFG). The budgetary rule (handlingsregelen) allows the Government to spend the expected real return on the GPFG, previously estimated at four percent. However, the Government later

changed the budgetary rule from four percent to three percent in Meld. St. 29 (2016-2017). The thought behind this is to have big swings in petroleum income managed evenly over time in the government budget, thus screening against short-term swings. This is to prevent significant and sudden adjustments between the exposed and the sheltered sector.

The budgetary rule is flexible and can deviate from the three percent rule. When the economy is in a recession, the rule gives room to exceed the real return of three percent. This is to contribute to increased employment and output. Similarly, the rule leaves room for tightening up and saving in periods with high activity. Therefore, the budgetary rule framework gives a basis for a predictable fiscal policy and cycle stabilizing measures. This leaves politicians with the opportunity to screen expenses against tax level changes in cases of cyclical swings.

Altruism is considered as the core of the budgetary rule. The petroleum revenue is to be used in a way that benefits future generations of Norway. From a sustainable perspective, it is reasonable to claim that petroleum wealth belongs to all generations. The return on this wealth lays a foundation for a lasting higher consumption in Norway.

The major global economic recessions were after the dot-com bubble in 2000 and later the global financial crisis. These are examples of occasions where politicians have deviated from the budgetary rule. During the period 2003-2007, the fiscal policy was less expansive than the budgetary rule suggested. However, the budget deficit was growing and was estimated to be about an average of 16 percent from 2001-2009. In the years before the financial crisis, from 2001-2007, the budget deficit's growth was an average of approximately 10 percent (Finansdepartementet, 2021).

"Dutch disease" is a concept that took place in the 1970s. It appeared due to high public consumption following the Netherlands' discovery of vast natural gas fields in the North Sea. This discovery resulted in a significant amount of labor, capital, and resources moved from the exposed sector to the sheltered sector. As a result, workplaces closing and reduced competitiveness followed. This development went overboard, and significant deficits in the external economy and the public finances made it necessary to tighten up eventually. The reversal of this involved a massive increase in unemployment and created a recession as a result. The dutch disease implies a real appreciation that leads to sheltered goods becoming more

expensive than exposed goods. This is either due to the nominal exchange rate strengthening or domestic price inflation being higher than foreign price inflation. As a result, tendencies of a restructuring happen - where the sheltered sector strengthens considerably.

## 4. COVID-19

### 4.1 Global outbreak

COVID-19 originated in Wuhan, China, in December 2019. Even though China implemented drastic measures to contain the virus, it reached countries worldwide within weeks. These countries had different initial impacts from COVID-19, where Italy was the country that was hit hardest. On the 8th of March, 2020, the Italian Government finally issued a nationwide lockdown in an attempt to contain the virus. China's fast and effective lockdown measures proved to be the correct pandemic containment plan. Already in March 2020, China's total number of cases started to decline, while in the rest of the world, more and more cases were reported.

As mentioned, Italy was the first country in Europe to see a major outbreak that arrived at the end of February. In the same time frame, both Latin America and the US experienced their first confirmed death from the virus. Lockdown procedures were still not implemented as cases had not spiked to the amount we saw later on. In the middle of March 2020, the first countries in Latin America announced countrywide lockdowns or closed their borders. These countries were: Venezuela, Ecuador, Peru, Colombia, and Costa Rica.

Norway saw its first signs of a major virus outbreak in March 2020, where the Government already had implemented the most "strong and intrusive" measures seen in Norwegian peacetime. Panic around the severity of the virus festered in the general public, where insurances from the state had to be made regarding the availability of food and supplies. At the same time, borders were closed to foreigners. After two months of extreme measures to prevent the virus from spreading, Norway slowly removed or reduced measures. Similar to other countries, the spread of the virus came in waves. Opening of schools resulted in a surge in the spread, as well as seasonal changes leading to more people staying indoors, increasing the risk of infection. Depending on the number of COVID-19 cases, the Norwegian Government has reacted with measures accordingly.

After nearly three months of the COVID-19 timeline, the European Union announced its first coordinated response to the global pandemic. This effort consisted of closing a total of 26

country borders from the rest of the world. The travel ban was intended to last for at least 30 days, where only essential travel would be permitted.

The US became the world-leading country in COVID-19 cases at the end of March 2020. At the beginning of April, the pandemic seemed to hit the labor market hard. Taking the US as an example, millions of Americans lost their jobs as it was evident that COVID-19 was here to stay, and consequently, firms began downsizing. In the last week of March, nearly 6.6 million people applied for unemployment benefits. To emphasize the severity of how hard the labor market had been hit, the worst week for unemployment filings before this was in 1982 with 695,000 filings.

By the end of April, the global pandemic reached a death toll of 200,000 people with 2.8 million total cases. The real number of cases was presumed to be higher, as the availability of COVID-19 tests limited the confirmed number. Several countries did not have access to proper testing, and therefore total COVID-19 cases are assumed to be higher.

The 17th of May was the official date of two of the worlds' largest economies entering a recession, Germany, and Japan. This was Japan's first recession since 2015, where the economy shrank by 3.4 percent in only the first three months of 2020. At the same time, Germany suffered its worst contraction since the financial crisis in 2008, where the economy shrank by 2.2 percent in January-March from the last quarter.

Until June, regions of the world that currently had not experienced a major outbreak of COVID-19 could no longer boast of low numbers of cases. Instead, countries in the Middle East, Latin America, Africa, and South Asia were hit extremely hard. For example, it had taken 98 days for Africa to reach 100,000 COVID-19 cases, but only 18 days to double this number. Some experts explained the sudden surge in cases resulting from low- and middle-income citizens gaining access to more testing.

The US became the country with the most COVID-19 cases. Total deaths had surpassed 100,000 by the end of May, and the country continued to see record-breaking single-day cases at the end of June. Particularly southern states saw massive increases in cases. The virus outbreak had become so bad in countries such as the US, Brazil, and Russia that the European Union opened its border to certain countries. These were not among them.

Healthcare has been a controversial political topic for a long time in the US and became even more so during the pandemic. As a result of the virus outbreak, 5.4 million Americans lost their health insurance in the period of February and May. This was a direct consequence of people becoming uninsured as they lost their jobs. No other year has this amount of people become uninsured.

Since the summer of 2020, COVID-19 cases have come in waves. In-person schooling was reopened, and a new wave occurred. A study from South Korean disease control found that children between 10 and 19 contributed more to the spread of the virus than adults. The study explains that children practicing poor social distancing, spread the virus amongst households. Schools that saw increased cases after reopening quickly closed and moved to online tutoring.

Already in mid-August, the CDC began developing a distribution plan of the coronavirus vaccine. Over the span of ten months, COVID-19 related deaths had reached a total of one million worldwide.

Governments providing stimulus packages in economic recessions have been a widely used policy to aid economies in returning to stabilized growth. As a result, the European Union agreed on a large stimulus package consisting of 857 billion dollars that would benefit the nations that were hit hardest. Additionally, to recover and secure long-term growth, the European Union agreed on the largest stimulus package ever issued. The package is designed as a long-term budget covering the period of 2021-2027. In total, it will be worth 2.018 trillion euros at current prices (Publications Office of the EU, 2021).

#### **4.1.1 The Global economy**

In a globalized world, how well a country's economy is doing can be directly correlated to others. With international trade being such an important part of today's economy, there is no doubt that the global pandemic has been a detriment to the global economy. One of the largest impacting factors has been the unemployment rate.

Economic variables such as GDP, stock prices, employment rates, and private consumption declined in most countries. The United Nations (UN) expected global GDP to shrink nearly 1

percent within 2020. Economic activity depended on further imposed restrictions throughout the year, where consumer spending required correct fiscal responses. These economic variables are intertwined in a way that a decline in one will affect the other. As an example, we saw that consumption was severely reduced as a result of the pandemic. This was a result of prolonged lockdowns that increased household savings and unemployment rates. This translates into reduced international trading and lower GDP.

Global stock prices and workplace mobility took a massive hit during the pandemic. Between the 17th of February and the 12th of March, prices fell 30 percent (Davis, Liu & Sheng, 2021). During the next 11 days, stock prices fell another 10 percent. The stock market recovered half of its losses from the 23rd of March to the 9th of April as workplace mobility fell further. (Davis, Liu & Sheng, 2021) found that stricter lockdown policies resulted in larger declines in stock prices dependent on the pandemic severity, workplace mobility, income support, and debt relief policies. Additionally, results showed that this was even more so the case for large economies such as the US and China.

Sovereign debt standstills were proposed as the pandemic went global. Hatchondo, Martinez & Padilla (2020) found that a one-year standstill would generate a 0.1 percent and 0.3 percent permanent consumption increase. However, the results differed on the effect of the initial shock. Followed by these results, they also found that capital losses for creditors were between 9 percent and 27 percent.

The global economy has been in a recession for the majority of 2020 and parts of 2021. The cause of this directly correlated to lockdown measures causing labor scarcity to prevent the spread of the virus and severely reduced household consumption.

#### **4.1.2 Norwegian trade partners**

International trading is a vital part of Norway's economy. The European Union was Norway's largest trading partner in 2020, where imports excluding ships and oil platforms were estimated to 422 billion NOK. The valued import was five percent lower than in 2019 and the lowest since the mid-90s. However, imports from China saw an increase by about 20 percent in 2020, which

could be attributed to China's mass production of masks. In 2020, masks became China's most exported product. Other industry sectors also saw a massive decrease in imports to Norway. Sweden and Germany have been two of Norway's most important trading partners, where exports in both vehicles and especially mineral oil products saw a large fall. Vehicle export to Sweden in 2020 was estimated to be 2.7 billion NOK, which is a reduction of nearly 2 billion from the previous year. Export of minerals and mineral oil products saw the largest decrease in 2020 by 33 percent.

Great Britain has been one of Norway's largest importers of oil and gas in recent years. In 2020, the export of oil and gas to Great Britain was estimated to be worth 96 billion NOK. This was a reduction of 33.1 percent from the previous year. At the same time, oil and gas exports to European countries such as Great Britain, Germany, and the Netherlands decreased in 2020, and exports to China increased threefold. Germany has since 2013 been the biggest importer of Norwegian nature gas. The imported gas to Germany was estimated at 49 billion NOK in 2020, decreasing 34 percent from the previous year and more than half from 2018.

For the first time, China became Norway's largest import country in 2020, totaling 92 billion NOK and equating to 12 percent of Norway's import outside of ships and oil platforms. A large portion of imported goods from China consists of telecommunication apparatus as well as data processing equipment. Additionally, three out of four cellphones are imported from China, which has been the case for nearly six years. Similarly, laptops and tablets have about a ninety percent import ratio from China (Fossanger, 2021)

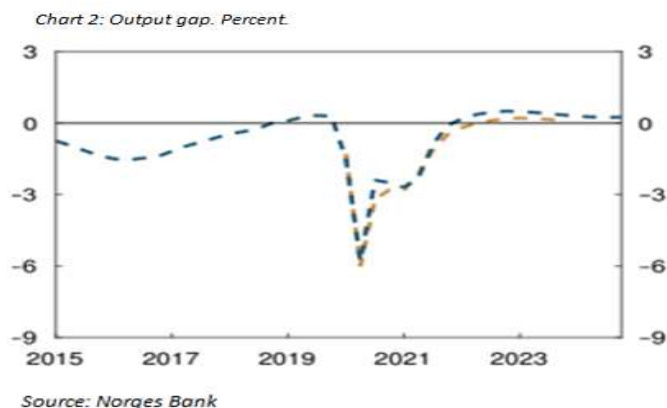
## **4.2 Real economic consequences**

### **4.2.1 Output and demand**

Even before the outbreak, there was evidence that the Norwegian economy was close to the peak of the economic cycle. Growth in the mainland economy slowed down towards the end of 2019, and projections suggested it would slow down considerably in 2020. The first shutdown in March 2020 led to mainland GDP in Norway falling approximately 11 percent from February to April (SSB, 2021b). However, activity recovered markedly towards the summer and continued



through autumn. The second wave of containment measures was introduced in November, following an international and national wave of COVID-19. In January 2021, the mainland GDP was 1.5 percentage points lower than before the outbreak (Norges Bank, 2021).

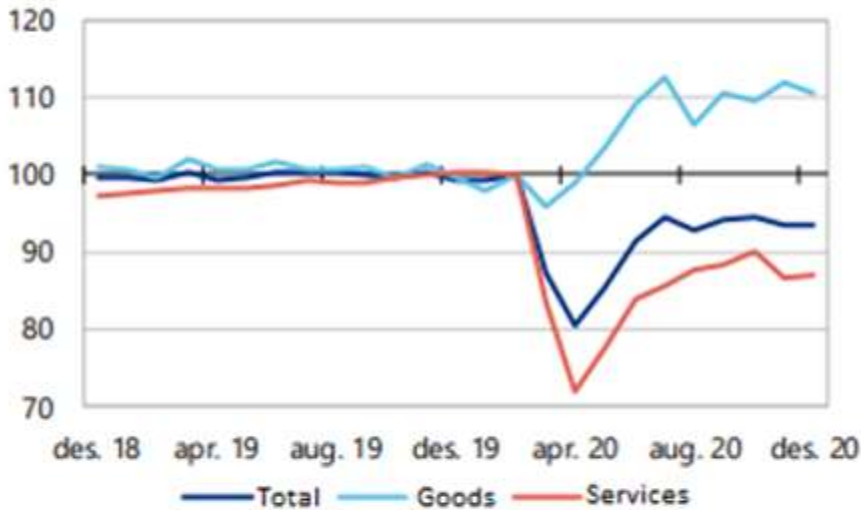


The Norwegian economy is in the middle of a deep downturn. However, with the anticipated reopening of society and further vaccination, it is expected that capacity utilization increases through 2021. Norges Bank projects the output gap to be slightly positive at the beginning of 2022, as illustrated in chart 2 above (Norges Bank, 2021).

#### 4.2.2 Private consumption

The March shutdown hit household consumption hard. Seasonally adjusted household consumption fell by 21 percent from February to April. After this, three months of major recovery took place. Especially the consumption of goods increased rapidly. In December, the consumption of goods was 12 percent higher than in February. The development in services has been considerably weaker. A new wave of COVID-19 and new containment measures shut down parts of the service sector and, as a result, stopped a big part of the consumption of services. At the end of the year, total consumption was still nearly 7 percent lower than in February (SSB, 2021b).

Chart 3: Private consumption  
Index, February 2020=100. Seasonally adjusted numbers



Sources: Refinitiv Datastream and Statistics Norway

Household real disposable income increased by one percent in 2020. A significant fall in employment reduced household salary income, but increased public benefits helped to maintain income. Additionally, the policy rate was reduced by 1.5 percentage points during the spring of 2020 and contributed to the mortgage rate falling by approximately one percentage point. Lower interest rates reduced household interest burden and increased their disposable income (SSB, 2021b)

Consumption fell significantly more than income in the first half of 2020. Limited potential consumption led to the saving rate increasing to 12 percent in the first quarter and a historically high 23 percent in the second quarter. After consumption recovered in the second half of 2020, the saving rate also decreased slightly. In total, the savings rate ended at a record-high 15 percent in 2020 (Regjeringen, 2021)

Containment measures limit the recovery potential for consumption of services. As soon as most of the containment measures are gone, the consumption of services is anticipated to recover quickly. Norges Bank projects household consumption to fall in 2021 Q1 but gradually pick up

in the months leading up to summer as vaccines are rolled out. The consumption of goods is expected to slow down as a shift to more services consumption is expected (Norges Bank, 2021).

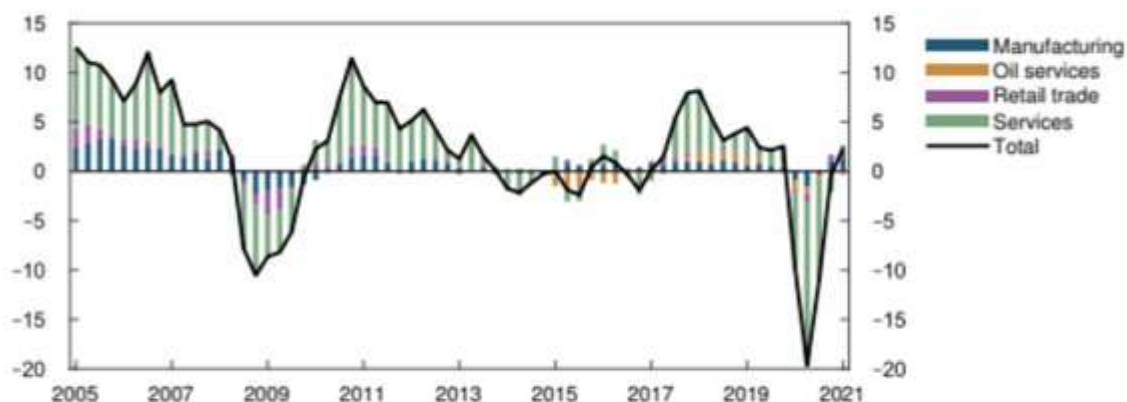
### **4.2.3 Business investments**

The development in business investments throughout 2020 was characterized by the uncertainty COVID-19 brought, both domestically and with Norway's trading partners. Investments fell markedly in the first half of the year, followed by a slight recovery in the second half of 2020. Although business investments rose by 2.5 percent in the fourth quarter, total investments for 2020 were more than 6 percent lower than in 2019, according to the national accounts (SSB, 2021b).

SSB maps investment plans of the manufacturing sector. According to their most recent study, investments are expected to fall by around 5 percent in 2021. The food products, beverages, and tobacco sector, which had a solid investment growth in 2020, contribute the most to the estimated decline within manufacturing this year. Repair and installation of machinery and equipment also contribute considerably. Overall, the low estimates for manufacturing investments must be seen in light of the powerful growth in 2019. Several large projects launched in 2019 entered their final phase in 2020, and a fall in investments was expected even with the pandemic. Lower oil prices and heightened uncertainty have amplified the reduced investment views for Norwegian manufacturing (SSB, 2021b).

As illustrated in chart 4, the pandemic has hit services businesses hard. The business's willingness to invest has been affected by a high uncertainty regarding the economic outlook and lack of financing due to poor liquidity, especially within industries such as travel and culture. SSB expects that investments for services businesses remain unchanged in the time ahead.

Chart 4: Expected change in business investment in the next 12 months. Percent.



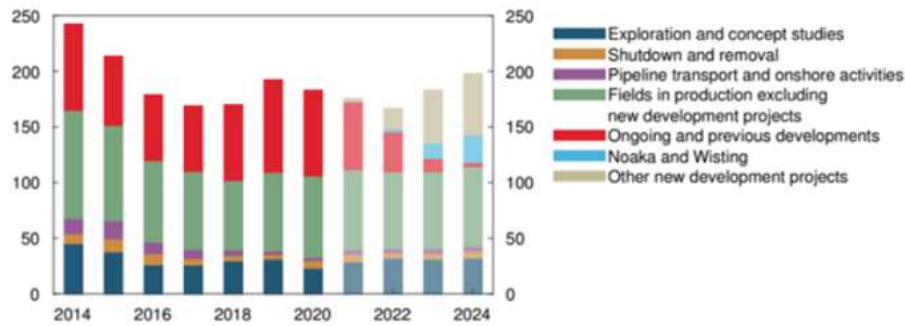
Source: Norges Bank

Business investments are projected to fall by approximately two percent in 2021. In line with the recovery from the pandemic, investments are expected to rise in the aftermath. The low-interest levels also suggest increased investments. According to SSB's calculations, investment growth in 2022 will be 3 percent and slightly lower in 2023 and 2024. With the proposed development, the investment level towards the end of the projected period will be slightly below the level before the pandemic.

#### 4.2.3.1 Petroleum investments

The nominal value of the petroleum investments amounted to approximately 180 billion NOK in 2020, increasing by barely 2 billion from the previous year (SSB, 2021b). However, this appreciation is primarily due to high price inflation. The petroleum investments fell by 5 percent after price inflation was adjusted. The fall in petroleum investments is tied to the fall in oil price, the pandemic, and heightened uncertainty. As seen in the previous section, the oil price fell dramatically with the COVID-19 outbreak but recovered throughout 2020.

Chart 5: Petroleum investment. At constant 2021 prices. In blns of NOK



Sources: Statistics Norway and Norges Bank

During the summer of 2020, Stortinget adopted a tax package for the petroleum industry. The support package raised the deduction in the special tax oil firms are subject to, from 20.8 percent to 24 percent. Moreover, the oil firms were able to depreciate investments included directly in the special tax immediately. As a result, the companies will pay less tax in 2020 and 2021 than they would have done under normal circumstances, where investments have to be depreciated linearly over six years. These tax reductions incentivize companies to launch development projects (Norges Bank, 2020b). Chart 5 shows that petroleum investments are expected to fall in 2021 but rise markedly in 2023 and 2024 due to new development projects. Although the tax package contributed to higher investments in 2020, it is also likely to affect the investment level in the following years.

#### 4.2.3.2 Housing investments

House price inflation and sales of existing homes had a brief decline in March and April 2020 but picked up markedly and continued to rise through autumn and winter. Although the majority of 2020 was affected by the pandemic, housing prices rose by 3.9 percent compared to the year before (SSB, 2021b). As a result of more people working from home and limited consumption opportunities, demand and willingness to pay for housing may have increased. Lower interest rates and historically high savings may have stimulated house prices.

Chart 6: Housing market, seasonally adjusted. Left axis: bln 2018kr, quarter. Right axis: Index, 2018 = 100



Source: Statistics Norway

As illustrated in chart 6, housing investments were generally low throughout the year but picked up by nearly 5 percent in the 4th quarter. The economic uncertainty in 2020 likely reduced the buyers' willingness to commit to long-time contracts where the house is not completed. Another possibility is that there was just a limited supply of new houses. The development at the end of the year and current numbers indicate that housing investments will grow in the future.

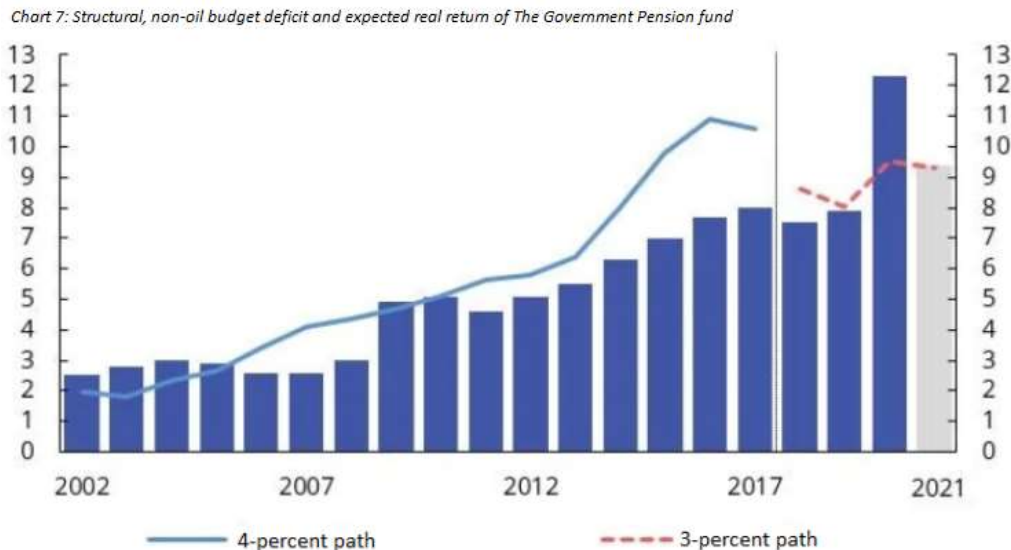
Additionally, the high house price inflation makes residential construction more profitable. SSB projects that housing investments will grow by approximately 3 percent per year as we advance, and by 2024 it will be close to the peak in 2017.

Household income growth will eventually increase in line with the recovery from the pandemic. However, prospects of higher interest rates, normalization of household consumption, and increased residential construction contribute to house prices slowing down gradually in SSB's projections. House prices are projected to rise by 9 percent in 2021 and then gradually slow down towards 2024.

#### 4.2.4 Public spending

Fiscal policy has dampened the negative consequences of the pandemic on the Norwegian economy. Stortinget adopted several economic measures and temporary regulatory changes to compensate for the loss of income for households and businesses. These measures have increased public expenses significantly. Last year, personal income security programs were extended in the most critical period, and liquidity support for businesses was established (Regjeringen, 2020a). These measures included reduced or deferred taxes, government loan- and guarantee programs, and compensation schemes to cover fixed, unavoidable costs for businesses with significant revenue failures. A scheme that gives firms that take back furloughed employees wage support was also introduced in July/August.

According to preliminary numbers from national accounts, the COVID-19 economic measures amounted to 131 billion NOK in 2020. The structural, non-oil budget deficit is estimated to be 392,5 billion NOK in 2020. This equals approximately 3.9 percent of the fund's market value at the start of the year. Illustrated below is the structural, non-oil budget deficit and expected real return of The Government Pension fund from 2002 to 2021. The blue line shows the former four percent rule, and the red line shows the current three percent rule (Regjeringen, 2020b).



Source: Regjeringen

In the 2021 national budget, the Government proposed that many of the current measures should be phased out this year, and as a result, withdrawals from the pension fund should decline significantly. However, at the end of January, the Government proposed new financial measures totaling 16 billion NOK to tackle the pandemic (Regjeringen, 2021). As a result, public spending in 2021 will be higher than initially projected. Nonetheless, the structural non-oil deficit remains 3.3 percent of the fund's market value in 2021 as projected due to the value of the fund increasing more than expected. In 2022 the deficit is assumed to decrease to 3.1 percent of the fund's market value, and a further decrease to just below 3 percent in 2024 is expected. This results from expectations of phasing-out of containment measures and lower growth in public demand.

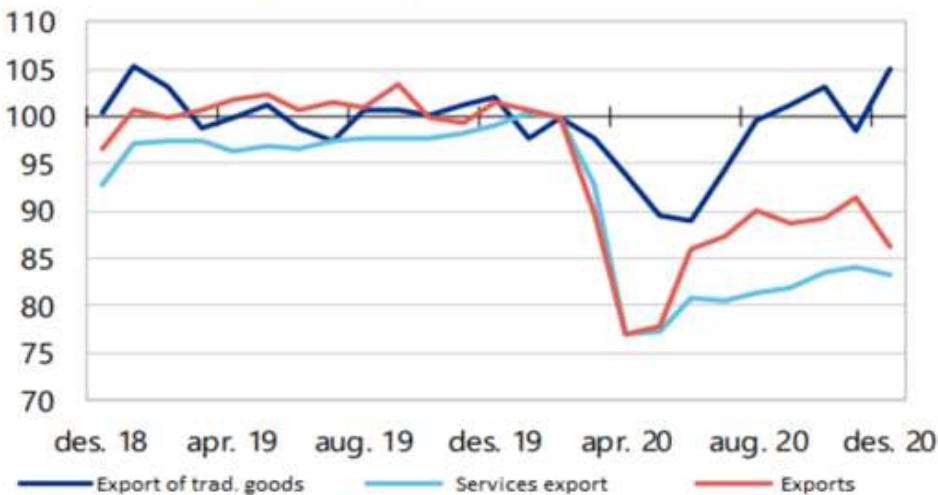
#### **4.2.5 Exports**

The activity of Norway's trading partners fell significantly in 2020. This meant that they imported less in general, which impacted Norway as well. As illustrated in chart 8, the export of traditional goods and services fell abruptly in the first half of 2020 but recovered in the second half of the year. Manufacturing goods make up nearly 80 percent of traditional exports and fell by more than five percent in 2020 (Regjeringen, 2021). The decline is primarily due to the lower export of engineering products and refined petroleum products. The former is likely connected with decreased petroleum investments globally.

On the other hand, the export of oil and gas increased in 2020. However, low global prices for oil and natural gas combined with a bigger price decline for export than the import of traditional goods led to the first deficit in foreign trade for Norway since 1988 (SSB, 2021b). The deficit is primarily due to oil and natural gas prices being detrimental to Norway's trade balance.



Chart 8: Exports  
Volume index, Feb 2020=100. Seasonally adjusted



Sources: Refinitiv Datastream and Statistics Norway

Exports fell by more than 8 percent in 2020. The main reason for the decline in exports is the lower export of services. Services export fell by approximately 13 percent in 2020; two-thirds of this decline is due to transport services falling by 70 percent as a result of containment measures and travel restrictions (SSB, 2021b).

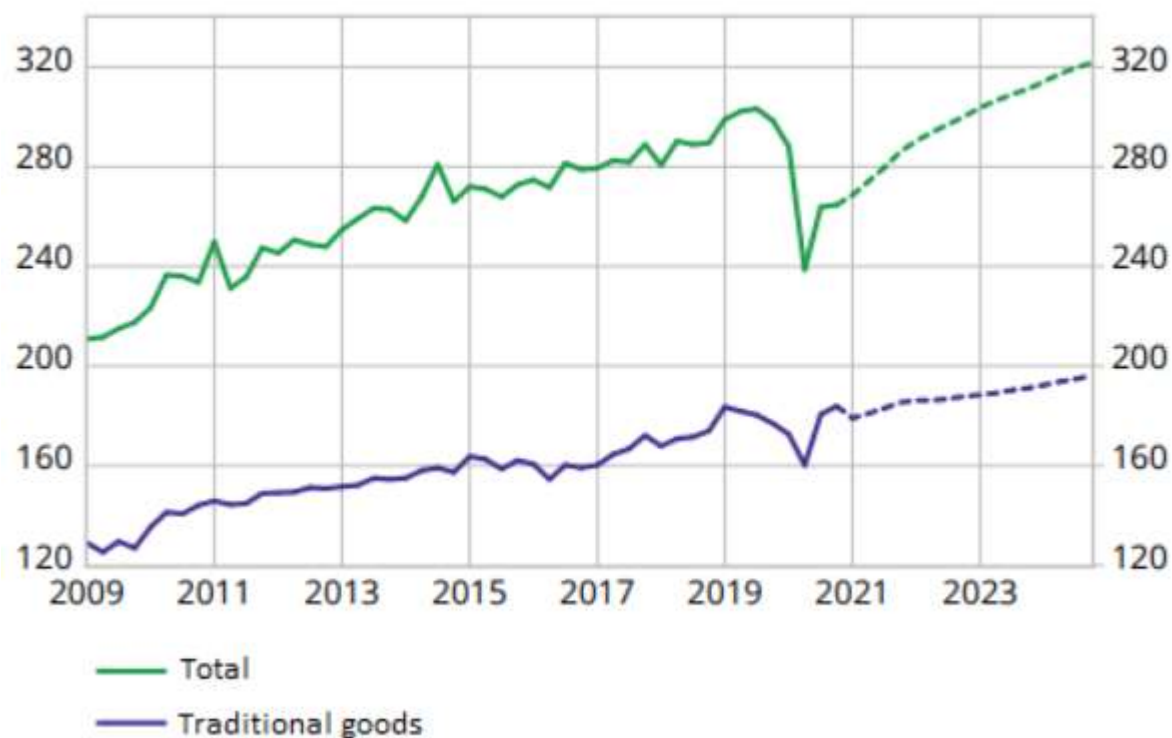
Norges Bank expects travel activity to remain low in the first half of 2021 and then continue to rise in the period to 2024. This is primarily due to expectations of travel restrictions and containment measures being lifted going forward. Oil service exports are projected to remain unchanged in 2021 and then rise due to investment growth in the global petroleum industry. Other exports may also get a boost due to higher activity among Norway's trading partners as we advance (Norges Bank, 2021).

#### 4.2.5.1 Imports

The development in import is a similar story to the export one. Import of services and primarily transport services contribute the most to the decline. Transport services fell by 100 billion NOK and represent more than 80 percent of the total import decline in 2020. Import of transport

services is bigger than the export of transport services, as Norwegians travel abroad more often than foreigners travel to Norway.

Chart 9: Imports.  
Seasonally adjusted, bln 2018-kr, quarter.



Source: Statistics Norway

Like exports, imports of traditional goods fell abruptly in March and April and rose in the second half of 2020. It was mostly the same services and goods that were the most affected by the pandemic: refined petroleum products, metals, and engineering products fell, whereas sales of food, beverages, and tobacco increased.

The pandemic is expected to restrict traveling in 2021 as well. Several countries have tightened their containment measures in line with new and more contagious mutations of the virus. However, many of Norway's essential trade partners have been hit harder by the pandemic, and the recovery in these countries may be stronger than in Norway. Moreover, in the coming years, imports are expected to increase with an upturn in domestic demand and lifted travel restrictions (Norges Bank, 2021).

### 4.3 The labor market

As a result of the pandemic outbreak, historically high numbers of furloughs and a decline in employment followed. Industries and jobs with different wage levels were hit unevenly, and the employees earning less than average were hit the hardest. In recent years, annual wage growth has increased from 1.7 percent in 2016 to 3.5 percent in 2019. Estimates from the national accounts show an average annual wage growth of 3.1 percent in 2020, considerably higher than expected (SSB, 2021b).

The shift in the Norwegian economy influenced the labor market heavily. Relatively lower output and employment led to a lower labor supply. Following the shutdown after the outbreak, fully and partial unemployment abruptly quadrupled. The reopening led to half of this leading up to the end of summer. Since then, unemployment seems to have stabilized on a level approximately double what it was before the pandemic. The numbers at the end of 2020 show that several industries ended up on similar activity levels as before the outbreak. However, some of the industries were down 30-40 percent. Unemployment in these sectors increased the most, and tourism was hit the hardest.

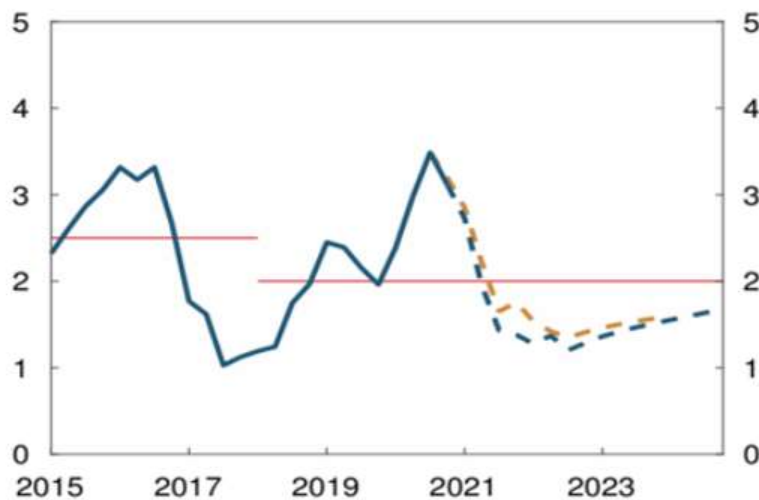
According to the national accounts, employment fell by 1.3 percent and total hours by 2.2 percent from 2019 to 2020. This gap is likely due to total hours reflecting furloughs and other types of absence, as the national accounts consider one employed up to 90 days after the start day of the furloughing.

The number of furloughed workers has risen at the start of 2021, likely due to higher infection rates and stricter containment measures. SSB expects the labor market to improve in the second half of 2021, in line with the vaccination of citizens combined with a continued expansionary fiscal policy and lower interest rates. Moreover, international activity is expected to pick up.

## 4.4 Inflation

As chart 10 illustrates, Norway cut its inflation target from 2.5 percent to two percent in 2018. Underlying inflation increased through spring and summer 2020. The rise was primarily due to higher imported goods inflation, which happened due to the krone depreciation through spring and winter.

Chart 10: CPI-ATE. Four-quarter change. Percent



Source: Norges Bank

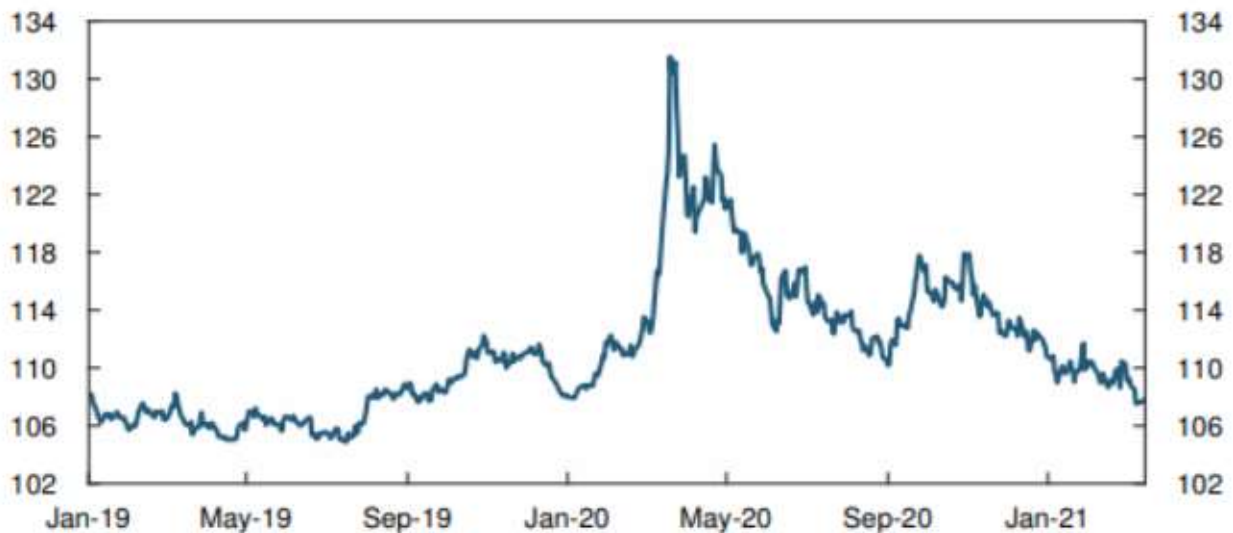
Imported inflation has declined since summer in line with the effects of the krone depreciation in 2020 fading but has stopped falling in the first months of 2021. The rise in prices for domestically produced goods and services was lower than projected in 2021, which may indicate that low capacity utilization has contributed to a faster decline in domestic inflation than expected.

In the following months of 2021, Norges Bank expects the underlying inflation to move down quickly towards the 2 percent target due to imported and domestic inflation falling. As illustrated in chart 10, it will be roughly 1.3 percent in 2022. At the end of 2024, it is expected to be 1.7 percent due to higher capacity utilization. However, there is considerable uncertainty tied to the pandemic. Inflation is projected low, in line with the low capacity utilization, but other factors such as extra costs related to containment measures and changes in taxes may contribute to a different outcome (Norges Bank, 2021).

## 4.5 The foreign exchange market

Chart 11 shows that the krone hit record-weak levels after the outbreak. The krone was at its weakest towards the end of March. Limited liquidity and uncertainty in the krone market contributed to amplifying this development. Norges Bank decided to intervene when the krone hit record-weak levels and made NOK purchases in the foreign exchange market, totaling 3.5 billion NOK. Since then, the krone recovered significantly but fluctuated somewhat during summer and winter. In March 2021, the krone had appreciated in recent months and was back to pre-pandemic levels. The changes in NOK are closely tied to risk sentiment in international financial markets and developments in oil prices.

Chart 11: Import-weighted exchange rate index (I-44)



Source: Norges Bank

Norges Bank expects the krone to remain close to its current level throughout the projection period, up until 2024. However, the central bank admits that there is considerable uncertainty regarding the long-term level of the krone (Norges Bank, 2021).

## **5. Discussion and international comparisons**

### **5.1 Monetary policy**

#### **5.1.1 Monetary policy 2020-2021**

January 2020 was the Central Bank's first policy rate decision meeting after the first confirmed COVID-19 cases. At this point, the assessment was that the risk of a major setback in the world economy would not occur and that the economy was at its business cycle peak. This assessment was clearly a bit too optimistic in hindsight. However, it would be unfair to expect them to predict what 2020 was about to endure.

The policy rate was reduced from 1.5 percent to 1 percent 13th of March 2020. In March, the Central Bank already addressed the consequences the pandemic was causing and expected a much lower economic activity level. Firms were already struggling, and layoff notices had been issued. In addition, uncertainty about the length and severity of the pandemic were present currently.

Additionally, economic prospects due to a sharp fall in oil prices were weakened. Therefore, the Central Bank also advised the Ministry of Finance to immediately reduce the countercyclical buffer for banks from 2.5 to 1 percent. Norwegian Banks have historically been solid, as previous financial crises have shown. The goal of a reduced countercyclical buffer is to counteract bank's lending standards in an economic downturn. Extraordinary 3-month F-loans were also offered to ensure that the new policy rate would impact the monetary market interest rates.

However, economic and financial circumstances could hardly be any worse at this time, which is why we find it curious that the countercyclical capital buffer was not cut to its minimum of 0 percent. Other European countries acknowledged this; Sweden, Denmark, Germany, and the UK cut their countercyclical buffer to zero. Norges Bank seems to have attempted to be cautious, possibly fearing that increasing the buffer when the situation improved again would be difficult. In hindsight, we know that the economy and the financial markets improved drastically in the

following months; however, it seemed overly cautious in real-time. If this is not the time to cut it to zero, which is the minimum level, when is it ever a time to do it?

It is worth noting that the forecasts in this monetary policy report are based on information up until the 11th of March. As a result, they do not include the lockdown measures introduced by the Government on the 12th of March. Consequently, the forecasts were outdated at the time of publication, and, strangely, the Government did not inform Norges Bank of these harsh measures. Regardless, the bank acted swiftly after the publication and confirmed that they believed that monetary policy had an important role in fighting the economic consequences of the pandemic.

Only seven days later, another rate decision meeting occurred. 20th of March 2020 marked an extraordinary decision to lower the policy rate even further from 1 percent to 0.25 percent. At this point, businesses had completely closed or reduced their activity significantly. With the world economy suffering, oil prices falling further and a stressed financial market, additional measures were needed. At this point, several countries had already reduced their policy rates to 0. The Norwegian bank argued that they have room for economic policy maneuvers due to good welfare arrangements and solid banks. One could argue that the policy rate could have already been reduced to 0 at this point. Firms and households were struggling significantly with no signs of containment measures being lifted in the foreseeable future.

The next policy rate decision took place on the 20th of May 2020. The policy rate was reduced from 0.25 percent to 0 percent. Two months had gone by since the last policy rate change. We discussed that this change could already have taken place in March, as the future development of COVID-19 showed no indication of economic activity levels rising. Oil prices and the krone exchange rate continued to worsen, and the global economy was in a recession. The Norwegian Central bank added that they did not envisage any further policy rate cuts in the foreseeable future. The downside risks were less pressing in May than in the previous month, so the delayed cut seems to be that the bank realized that the effectiveness of the lower bound of the policy rate was not as powerful as expected, rather than a decision to wait and see with the final rate cut to 0 percent. Nonetheless, it is unlikely that the minor delay in cutting the last 0.25 percent had a significant negative effect on the economy.

The policy rate decision of the 20th of June was that it would remain the same. Activity levels had risen, however, still substantially lower than at the start of the year. Additionally, unemployment levels had fallen even further. On a positive note, the oil price had started to rise. A sector that suffered significantly more than others was the service sector. The service sector was affected more by lockdown measures, and until these are lifted, it will continue to suffer.

The 20th of August, 2020, was the next rate decision. This meeting confirmed what was expected in June. Norwegian economy would still be in an economic downturn, and prospects showed no improvement, largely due to the uncertainty of how the economy would rebuild. However, a noteworthy improvement was that economic activity had increased somewhat in the last few months, where unemployment levels also fell. Additionally, the Norwegian Krone had strengthened, and low salary growth implied lower inflation. Moreover, the trade-off between continuous support of the real economy and preventing the build-up of financial imbalances was brought up in the report.

The policy rate decision of the 20th of September was again to keep it at 0 percent. The necessity of keeping an expansionary policy to increase output and reduce unemployment levels was still a main priority. Norges Bank clearly stated in this report that normalization expectations were not enough for the bank to start tightening policy again; for that to happen, there must be clear signs of conditions absolutely normalizing. We believe this was a valuable statement.

Recovery expectations were made clear in the policy rate decision on the 20th of November, 2020. The Norwegian Central Bank announced that they expect the policy rate to be kept at 0 percent in the next couple of years. Economic activity has continued to increase but is still far from pre-pandemic levels. Furthermore, housing prices continued to recover.

Vaccines started rolling out in January 2021. In this month's policy rate meeting, the Central Bank determined that the policy rate would remain 0 percent and remain until economic activity normalized. The economy's recovery had significantly slowed down at the end of 2020, largely due to increased COVID-19 cases and measures to prevent the virus from spreading. As of March 2021, economic conditions in both Norway and internationally have improved significantly. The Norwegian Government expects the majority of Norway's adult population to be vaccinated at the end of the summer, however, recovery in employment and unemployment



levels are expected to recover at a slower rate than economic activity. Currently, inflation is above its target but is slowly returning to normal levels. Growth in costs is seen both internationally and in Norway, which is caused by the high inflation. As mentioned, the Central Bank expected the policy rate to remain at 0 until 2020. However, due to economic recovery happening at a much faster rate, largely due to worldwide vaccinations, the rate is expected to increase gradually already from the second half of 2021. We think the vaccine scenarios in this report were a well-thought-out way to illustrate the extensive uncertainty that remained.

### **5.1.2 Communication and transparency**

Increased attention towards transparency has contributed to Norges Bank publishing several regular reports every year. Inflation and financial stability have been central to the reports from the start. Publication of the rate path increased monetary policy's efficiency and was given international recognition at the time. We can tie the discussion on transparency and communication to our review of the transmission mechanism in the theory section. Increased transparency and communication strengthens the expectancy channel and, as a result, make monetary policy more efficient and credible. This stands in contrast to the monetary policy a few decades ago, where it was characterized by secrecy.

During the pandemic, the turn of events has led to more analytical work than normal. An area of potential for improvements for Norges Bank lies within communicating when there are changes to its analytic tools and assumptions. The basis for rate decisions is well documented in every monetary policy report, but it is rarely announced when the assumptions change from the previous monetary policy report. This contributes to complicating the understanding of the monetary policy developments and is a paradox in the previously mentioned transparency line.

Moreover, the loss function is no longer published as a part of the basis for the rate decision in the monetary policy report. A higher degree of discretion may weaken the market's understanding of the basis for the rate decision. This can contribute to weakening Norges Bank's transparency line and, as a result, the expectancy channel's efficiency.

## 5.2 Optimal monetary policy?

The development in the Norwegian economy during COVID-19 has progressed similarly to the development around us. Still, Norway has fared better than most countries during the crisis, both health-wise and economically. The successful handling of the economic consequences primarily comes down to two conditions. Firstly, Norway has an industry structure that makes it possible for many people to work from home. Secondly, a continued expansionary policy has contributed to dampen the recession. Nonetheless, there are grounds to discuss if monetary policy has been optimal during the pandemic.

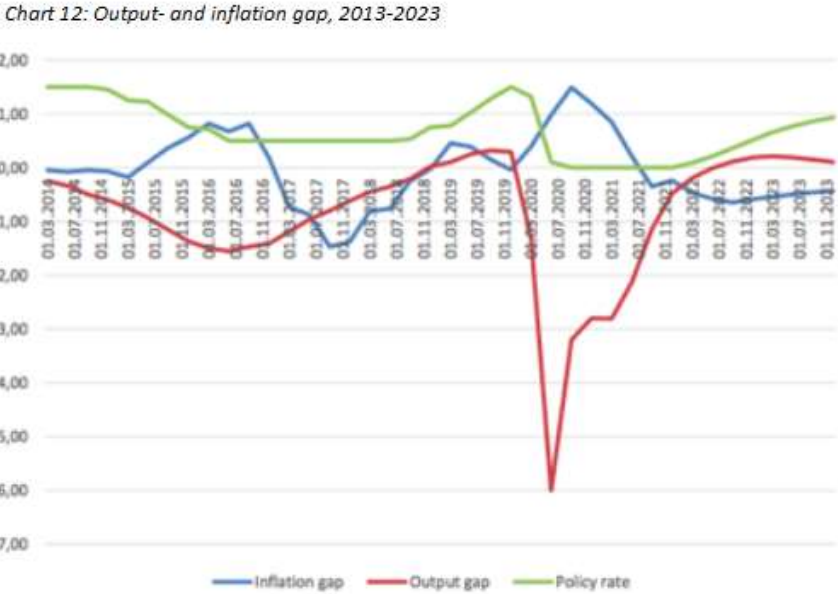
We will be looking at the policy rate based on the theory in chapter x, where we argued that Norges Bank is supposed to react to economic shocks. According to the criteria for optimal rate path, when the shocks are significant, the bank has the mandate to respond resolutely. The COVID-19 situation is unique and brought an unusual combination of demand and supply shocks. It is normal in most recessions that all sectors reduce their output simultaneously; however, this pandemic affects output and prices differently in different sections. Moreover, state-mandated lockdowns and social distancing orders led to output in certain sectors stopping completely. This laid grounds for expansionary policy.

The economic shocks suggest lower output and downward pressure on inflation. The model discussed in our theory section implies that optimal policy balances reaching the inflation rate target while also considering real economic stability. As a response to economic shocks, there will be a trade-off between the inflation rate target, closing the output gap, and assessing financial stability. Shocks create conflicts between these considerations, and the central bank will set interest rates in a way where the inflation gap and output gap have opposite signs.

Monetary policy's primary mandate is not to control every detail in the development of financial imbalances. That would affect the aim of being an independent central bank. The most important measure to maintain financial stability is strict regulation and surveillance of financial institutions (Olsen, 2016). When the inflation target was introduced in 2001, financial stability was not of significant importance. It was, however, mentioned in the monetary policy mandate to counteract the build-up of financial imbalances. It was primarily after the financial crisis in 2008

that financial stability became important in the interest rate setting. It became evident how great of an impact financial imbalances could have on an economy in a crisis.

Key indicators for financial imbalances such as household debt and housing prices have risen steadily for a while, aided by the low interest rate level in Norway and internationally. Despite this development, there are few concerns among the economists in Norges Bank that financial balances will get out of hand. It is also worth noting that the variance in the financial balances has decreased considerably in the last decade. At the same time, it is evident that Norges Bank has gradually increased its financial stability considerations in its interest rate setting. In the next section, we will discuss this development.



Source: Norges Bank

Looking at the development of the output gap and inflation gap in recent years, some interesting observations are to be made based on our model. Leading up to the end of 2016, the inflation gap was positive or close to zero. Simultaneously, the output gap was negative, and the size of the two gaps was similar. This is in line with what our model discussed in theory. However, looking at the period after this, from 2017 to mid-2018, both gaps were negative. Nevertheless, the policy rate remained unchanged during the mentioned period. This period called for a more expansionary policy in theory and, as a result, a lower policy rate. However, financial imbalances increased during this time, which calls for a higher policy rate in isolation. As a result, these two

developments likely canceled each other out, which is why Norges Bank chose to remain the policy rate unchanged. This seems reasonable and in line with optimal policy.

In the short period before the pandemic, the two gaps came closer to their target, leading to the policy rate being adjusted up. As Norway went into lockdown in March 2020, the policy rate was cut to one percent, with a further cut to 0.25 percent a few days later. In May, Norges Bank decided to cut the rate to zero percent, the lowest its ever been during inflation targeting. As shown in chart 12, the output gap went from slightly above zero to -6 percent shortly following the lockdown.

At first glance, the estimates suggest that the policy rate should be lower. However, a recent study shows that negative policy rates which have previously been implemented by Denmark, Japan, Switzerland, and the Eurozone have little to no effect and even potentially lead to a less expansionary policy (Eggertsson et al., 2017). Moreover, the policy in Norway is also supposed to prevent financial imbalances from growing in the economy. After spring, the dilemma between supporting the real economy and curbing financial imbalances became more noticeable. As a result, the current development of debt burden for firms and households is of interest. The household debt ratio is high and has increased significantly over the recent years. This has happened in line with increasing housing prices. The low policy rate has made it easier to take out bigger loans, which pressures housing prices up. Based on the financial imbalances considerations combined with the inflation and output gap argued above, the policy rate cut looks to be an appropriate response to the pandemic.

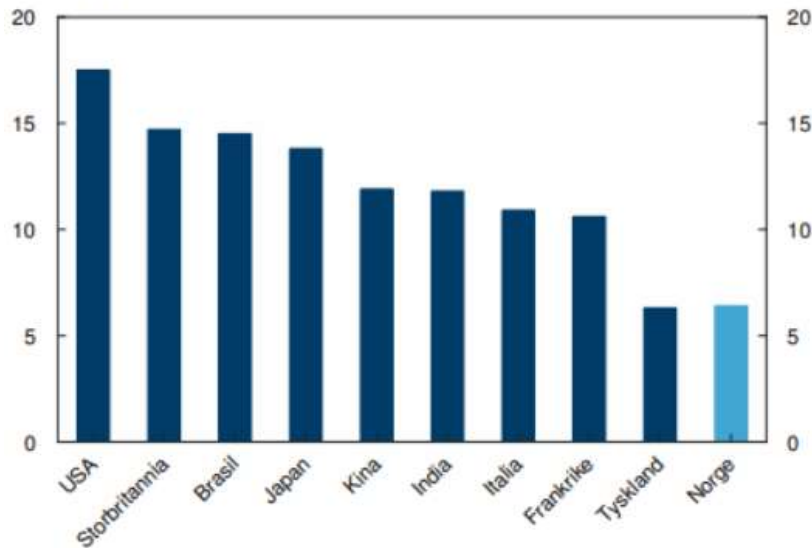
It is worth noting this conclusion is based on data and estimates. Measuring the output gap can be very difficult. Actual output is easy to measure as we know what is happening. Potential output, however, is difficult to calculate because we can not determine it. As a result, it can only be estimated or predicted, meaning the numbers come with some uncertainty. Moreover, actual output data has significant lags. Looking at the data in the monetary policy report released in June 2020 as an example, an output gap of -6 percent was estimated. Simultaneously actual GDP fell by approximately 9 percent (Norges Bank, 2020c). With the uniqueness of the COVID-19 situation and the forced lockdowns, is it sensible to assume that the economy could have avoided

2/3 of the production fall? It sounds unlikely. The fact is that the measures did not intend for it either, seeing as the aim of the lockdown was to reduce the transmission of the virus, and as a result, limit social interaction and activity, which hit several sectors hard. Consequently, the economic activity took a deep downturn, and the potential activity must have as well. We think that this is worth considering and that Norges Bank might want to reconsider its estimates in this regard.

### **5.3 International comparison of the monetary policy**

International monetary policy compared to Norway has been similar to the pandemic spread globally. Interest rates were quickly set to 0 percent, and in some cases, below. The Euro area, as well as Sweden and Denmark, set their policy rates to under 0 percent. In our equation for optimal interest rates, a comparison to foreign interest rates is implied. This results in a lower policy rate that follows Norway's trading partners. Activity levels have been far lower during the pandemic than during the financial crisis of 2008. This is the case even though governments are running a far more expansionary policy during the pandemic. Chart 13 illustrates the powerful fiscal policy from major countries in comparison with Norway. The shutdown was abrupt and brutal and affected businesses very differently. Fiscal policy has directly directed the measures to the sectors where containment measures have hit the hardest. Unnecessary losses of workplaces had to be avoided. Lockdown measures cause economic activity to be a lot lower even through an expansionary policy. DNB (2020) expects COVID-19 to have caused chronic damage to the global economy.

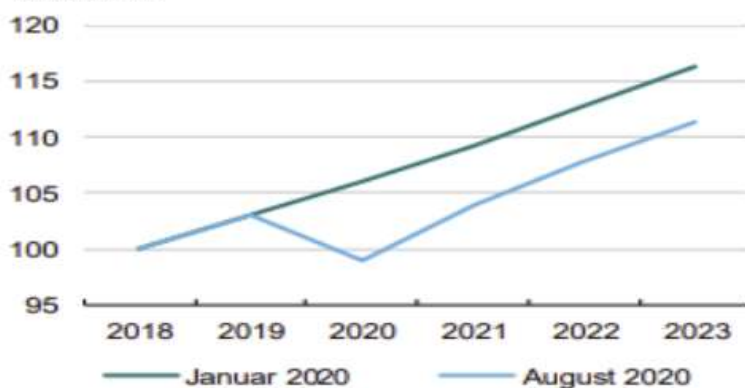
Chart 13: Powerful fiscal policy  
Increased expenses and reduced taxes. In percentage of GDP



Sources: IMF and Norges Bank

As of August 2020, global GDP was expected to fall by 4 percent in 2020 and then rise by about 5 percent in 2021 (DNB, 2020). However, the graph below shows that economic activity will not rise to the same levels as before the pandemic hit. Increased financial imbalances, debt, and stagnation in globalization are presumed to be some of the causes of long-term damage. Although the global economy has suffered a big hit, if not for large economies providing financial support to near-bankrupt sectors, the damage would have been even worse. As mentioned, both Europe and the US have provided massive stimulus packages in the form of erasing debt, direct transfers, and delaying taxation and expenses.

Chart 14: Estimates of global GDP  
Index. 2008=100



Sources: Refinitiv Datastream and DNB Markets

Lockdown measures have been a determining factor of economic activity in the global economy. Several sectors have managed to find solutions where working from home has become prevalent during the pandemic. Tourism and the service sector are completely dependent on measures being lifted to increase activity due to working from home not being an option.

#### **5.4 The credit market**

The credit market has played a vital part in economic downturns to stimulate economic activity. This was first shown during the financial crisis, where Norwegian banks' solidity was questioned. Although the crisis was not a crisis for Norwegian banks, the monetary policy was first directed to address it as if it was. Monetary policy directed towards the credit market during COVID-19 has been vastly different. The Norwegian monetary policy aimed to increase economic activity by reducing the costs of loans for investment projects, as an example. When the policy rate was reduced from an already relatively low rate, they offered commercial banks so-called F-loans to ensure that a lower rate would impact the credit market. These loans ensured that banks would have sufficient capital in a time of uncertainty and risk. We often separate the market into high- and low-risk credits. As a result of COVID-19, weak credits or so-called “High Yield” were severely weakened and have not recovered well. At the same time, strong credits or so-called “IG credits” recovered at a similar rate as the stock market.

Even though measures were taken to secure project investments through the credit market and the impact COVID-19 has had compared to the financial crisis, we still see a notable difference in predicted bankruptcy filings, specifically in the high rate market. This market operates with a credit premium of 7.5 percent. Today, an accumulated bankruptcy will be nearly 30 percent within the next few years. COVID-19 has had a more severe impact on the credit market compared to the financial crisis, where accumulated bankruptcy for global high-yield totaled 17 percent. The cause of the economic downturn is likely the explanation for this.

## 5.5 Fiscal policy

The role of fiscal policy has been different compared to previous financial crises. Usually, fiscal policy has been targeted towards maintaining the activity levels, but during the pandemic outbreak, the aim was to screen households and firms from a fall in revenue when the pandemic led to an abrupt fall in the economic activity.

It is vital for the effect of public spending that it appears credible to the agents in the economy that expansionary public spending is reversed without higher tax levels in the future as a consequence. In a situation where the agents expect increased public spending to lead to a higher tax level in the future, a tendency of forward-looking agents saving today to handle increased expenses in the future will appear. Therefore, it is crucial that households and businesses believe that increasing public spending leads to lower expenses in the future. In Norway's case, this implies that credibility towards the budgetary rule remains. Consequently, Norway should return to the usage of the oil fund within the budgetary rule soon. Norges Bank projects economic activity back to normal levels in 2022 (Norges Bank, 2021).

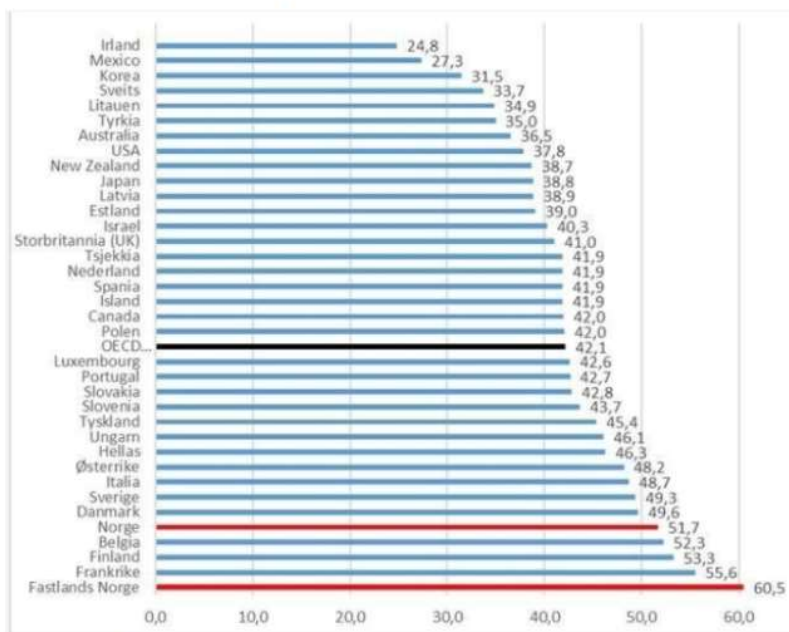
An expansionary fiscal policy will, in isolation, lead to an appreciation of the real exchange rate and relative strengthening of the sheltered sector. Usage of oil revenues that are too expansionary might lead to a big sheltered sector, while the exposed sector is reduced. This was previously discussed in our theory section, known as the «Dutch disease.» There are signs of increased cost growth and expense growth leading in this direction. However, the central bank argues that strengthening the NOK and moderate wage growth suggests that inflation will abate (Norges Bank, 2021).

The fiscal policy faces some challenges at this point. It is interesting to discuss the long-term consequences of the current expansionary policy. Firstly, a continued expansionary policy will lead to further pressure on prices and wages when pressure on the economic capacity arises again. Secondly, there are concerns of the public sector continuously increasing in Norway. Statistics from OECD show that Norway has the highest level of general government employment among OECD countries, with over 30 percent of total employment (Government at a Glance, 2019).



The basic theory of stimulation of aggregate demand through public spending came from Keynes' theory and was previously introduced in our theory section. The theory states that public spending will stimulate aggregate demand through a multiplier effect. This involves demand increasing more than the initial increase in public spending. However, an empiric study (Barro, 2009) does not show any evidence for such a connection. Moreover, even if there is a positive connection, there is no statistical significance for the connection being larger than 1. Based on this, there are grounds to argue that public projects in a recession should be considered by present value and long-term profit rather than political party dependent trade-offs. As a result, fiscal policy measures will contribute to a temporary increase in aggregate demand and long-term economic growth.

Chart 15: The public sector in percentage of GDP in OECD countries



Sources: OECD and Statistics Norway

Chart 15 shows Norway at 51.7 percent, well above the average of 42.1 percent. Several successful economies with solid welfare arrangements, such as the Netherlands, are below the OECD average. However, the chart can be slightly misleading due to Norway's unique situation. Extraction of oil and gas services contribute to high GDP but have few employees, and revenues from the industry give an unclear picture of its importance for continued development in the

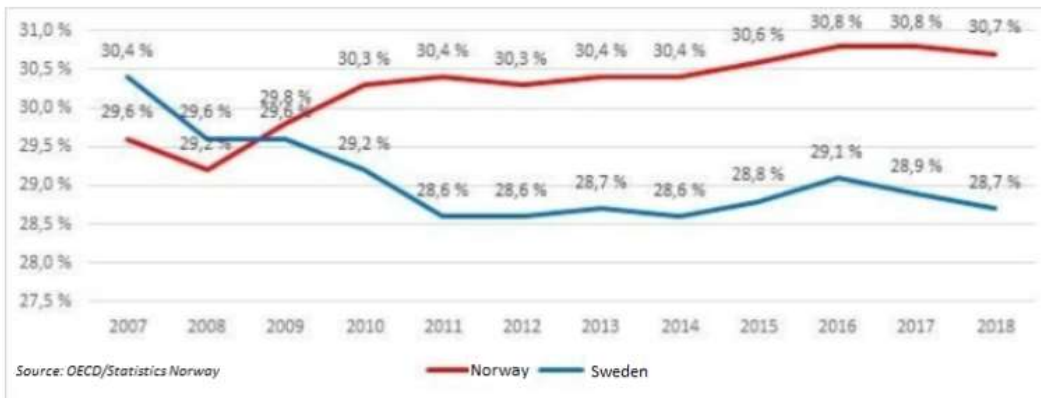
Norwegian economy. This part of the Norwegian economy will gradually be less critical, and the rest of the economic activity has to fund the public sector in the future.

There is a more accurate method to measure the status of the Norwegian economy. One could argue that oil extraction is not primarily a traditional business but a way to exchange natural capital for financial capital. The revenues from extracting oil are countered by a reduced amount of oil remaining on the Norwegian shelf, and as a result, a lower national wealth. Consequently, it is normal to separate the effect of oil activities and look at the value creation in the rest of the economy, also known as Mainland-Norway, to assess the situation in the Norwegian economy.

Chart 15 shows that if we measure the size of the public sector as a percentage of Mainland-GDP, Norway was at 60.5 percent in 2019, higher than any other country. It is worth noting that countries close to Norway's level have experienced bigger or smaller economic setbacks, such as Finland, or have been noncompetitive and had low economic growth, such as France, Italy, and Belgium. Regardless of the cause, it is thought-provoking that none of the countries close to Norway's level can be considered economic role models.

Statistics from SSB from 1978-2016 show that the public sector's percentage of Mainland-GDP has grown in economic recessions due to a combination of counter-cyclical policy and recessions. This is seen by looking at increased public spending and reduced growth in Mainland-GDP. With a continued expansionary fiscal policy, the size of the public sector will continue to grow unless something is done about it. According to the revised national budget, this number has increased by 6 percent since 2019. In other words, the public sector is currently responsible for two-thirds of the value creation in Norway. Moreover, this increase is the biggest increase recorded in a single year in recent years, which is in addition to the gradual rise in the last decade.

Chart 16: Comparison of public sector between Norway and Sweden since the financial crisis



Public services were generally barely affected by a lower activity level due to the containment measures, among other things, because the public sector did not furlough during the pandemic. This helped to stabilize the economic development. On the contrary, parts of the public services increased through increased allocations for health businesses, NAV, and the commune sector. Chart 16 shows that after the financial crisis, Sweden managed to move more workplaces towards private businesses. For Norway, it was the opposite – a gradual increase in the public sector in the years after the financial crisis.

Norway’s public sector is relatively effective, which allows a larger public sector than most countries before it harms economic growth. However, an empirical study conducted by Angelopoulos et al. shows that Norway is not among the countries where the trade-off between efficiency and size indicates that a bigger public sector would give higher growth. This study was conducted in 2008 and suggested that Norway’s public sector was already large enough to the point where it would harm the growth, even if it is effective. Since then, Norway’s public sector has grown significantly, and if the study were done in recent years, it would likely amplify these results.

Since parts of public spending in Norway are funded by transfers from the Government Pension Fund Global (GPF), we can maintain a lower tax level than what the size of the public sector dictates. A big part of the public sector's negative impact on growth is related to the real economic expenses of high taxes. With the GPF allowing lower tax levels, the negative consequences of a more extensive public sector are more negligible in Norway compared to most countries. Once the oil revenues eventually fall, a continuous bigger part of the public sector’s

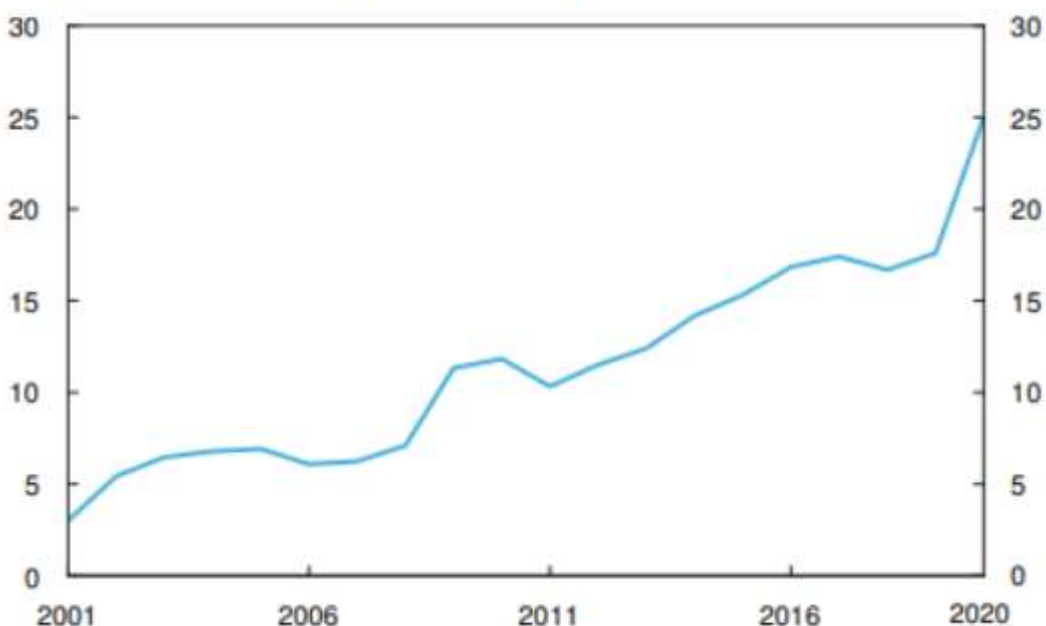
expenses would have to be covered by taxes and fees from the mainland economy. At this point, the costs of a public sector related to lower growth will fully kick in.

A public sector that is too big is problematic from an economic point of view due to the possibility of reducing the ability of economic growth and creation, with negative consequences for the country's prosperity in the long term. An extensive public sector also indicates that the civil service and communes have undertaken responsibility for several fields and have considerable societal development authority. From a liberal perspective, it is questionable, even if the purpose behind every expense is solid. Based on what we have discussed, we suggest Norway facilitate a significant commitment towards the private businesses after the pandemic to ensure that it is Norwegian workplaces that finances – and is not financed by – the National Budget in the future. If we see a similar development to what it was after the financial crisis, there is reason to be concerned.

### **5.5.1 The budgetary rule and the GPF**

During 2020 approximately 300 billion was withdrawn from the GPF to cover the deficit on the national budget. Chart 17 shows that the withdrawals from the fund have increased over the years, and in 2020 the fund covered a quarter of the expenses in the national budget. Because of the exceptional growth of the fund, this has been possible without exceeding the budgetary rule. However, it is worth noting that Norway has been affected by three major economic shocks in a short time, every time the withdrawals have increased without being reduced drastically afterward. The extensive oil money used during the pandemic has been justifiable. Still, it is worth remembering that the pension fund is a generation fund meant to be distributed today and for future generations.

Chart 17: Withdrawals from the GPFG. In percentage of public expenses

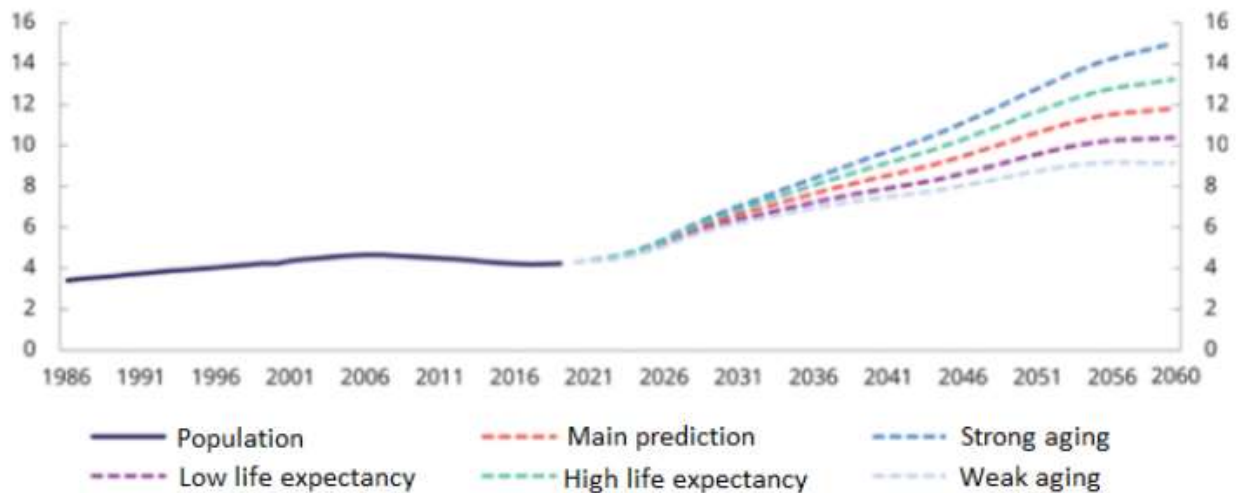


Sources: Statistics Norway, Norges Bank, and Finansdepartementet

It has been evident that the demographic development in Norway suggests a continuously larger percentage of the country's population in pension, also known as an age wave. Chart 18 shows that the population aged 80 years or over is currently approximately 4.5 percent of the country's population. This number is projected to increase to 12 percent by 2060 and potentially as high as 16 percent.

Simultaneously, petroleum activities will continue to fall in the future. With this in mind, there are considerable challenges tied to future pension liabilities, stable low unemployment, and high employment. These long-term challenges suggest that the usage of oil revenues should be brought back within the budgetary rule in a reasonable time frame. The age wave will bring larger expenses towards social security and health and welfare services for the elderly. Numbers from the revised national budget show that expenses for social security connected to retirement pensions continue to grow yearly and are estimated to be 9 201 billion NOK for 2021. Pension expenses are already increasing, and by 2030, health and welfare services are expected to grow by a considerable amount.

Chart 18: Percentage of population 80 years and above



Source: Statistics Norway

These numbers are still lower than the value of the pension fund, primarily due to its tremendous growth in recent years. The fund was created to shield the Norwegian economy from fluctuations in oil prices. A majority of the resources on the shelf are extracted and placed in international stocks and obligations. The fund has become enormous, which has given room for maneuver in fiscal policy. Simultaneously, it has made us vulnerable to fluctuations in international securities markets. One vulnerability is traded for another one. It is improbable that the fund will continue to grow as quickly going forward, and measured in the value creation of the mainland economy, the fund is estimated to increase moderately in the upcoming years. The Government projects the fund to be unable to keep up with the growth in the economy in ten years. As a result, the funding from the fund will likely fall.

Based on this, there are grounds to argue that the fiscal policy should be reversed and stay below the budgetary rule to recover the losses. Since Norway has been well below the 3 percent-rule for many years before the pandemic, one could argue that the rule is applied as intended in theory, staying below three percent when the situation allows it and exceeding the limit when the times require it.

However, it is worth discussing if the budgetary rule is too lenient and perhaps outdated. The governor of Norges Bank, Øystein Olsen, mentioned in his yearly speech that he thinks the expected real return of the fund is below three percent. Moreover, he notes that the estimates on

lower expected real return from the fixed income portfolio alone are enough to determine that the fund's estimation is closer to two than three percent. This is thought-provoking. In other words, politicians should facilitate national budgets using below two percent of the oil fund every year as we advance, even though the budgetary rule limit is three percent. If they do not, we would be using more than the real return of the fund, and as a result, eat into the money of the future generation.

In previous years, the budgetary rule could be followed nearly slavishly. The oil money usage could be increased gradually. A fall on international stock exchanges could quickly be countered by refilling new oil revenues. With an enormous fund and falling petroleum activities, it is not that easy anymore. The fund's expected return, which is what the oil money usage is assessed by, could fluctuate up and down yearly. If the three-percent rule is followed slavishly, a powerful market correction will eventually be encountered. Phasing in oil money into the economy is doable, but a considerable reduction in oil money usage will create a crisis. If considerations towards the fall in value are ignored, the budgetary rule will ultimately appear useless.

Perhaps starting with a secure fund value is an idea, for instance, the fund value at the beginning of the year before the fiscal year. As a result, the fund will be a known size through most of the Government's budget process. Adding a margin of safety as a buffer is an option. The cap could be the highest of the expected real return of this fund's value, deducted by 0.5 percentage points as a safety margin, and the cap of the previous fiscal year. This way, the cap would only increase if the fund increased the year before the fiscal year. Concurrently, the acceptable underlying oil money usage would never fall. After a major value fall in the fund, the oil money usage would be above the expected real return. Over time, one would get back to the rule by adding new oil revenues and international stock exchanges bouncing back. The security buffer makes it easier to get back to the path of expectation, and this is when the underlying oil money usage can increase again.

## 5.6 The interaction between monetary policy and fiscal policy

The balance between monetary- and fiscal policy is crucial for structural changes. The balance affects how attractive investments are generally, and especially for investments in exposed versus sheltered sectors. If fiscal- and monetary policy ends up as exogenous, a conflict between the two arises. The reason could be a fiscal policy not considering the necessary change in output required to reach the inflation target or through expansionary budgets striving for employment goals that inflate the long-term economy.

An expansionary monetary policy leads to lower interest rates and typically a real depreciation of the exchange rate. Lower interest rates make investing more attractive, and by the improved cost-wise competitiveness, the policy will especially favor investments in the exposed sector over the sheltered sector. An expansionary fiscal policy increases demand, which promotes activity in the sheltered sector. It can also give higher interest rates than what would otherwise be the case. This means that expansionary fiscal policy can inhibit investments. This effect will be especially relevant for the exposed sector by not benefiting well from higher domestic demand and deteriorating cost-wise competitiveness.

Expansionary monetary policy contributes to structural changes, i.e., either by investing in new technologies that change industry structure in favor of the exposed sector or making it more attractive to invest in renewable energy. Expansionary fiscal policy, which traditionally increases domestic demand, mainly has the opposite effect on structural change. However, in a crisis with a high amount of free resources in the economy, it might be different due to higher demand towards sheltered sectors to a small degree displaces activity in other industries.

The interaction between monetary and fiscal policy may change in a crisis when the policy rate is lowered to zero. Suppose the monetary policy is limited by the lower levels of the policy rate. In that case, the central bank will not stimulate the economy as much as they wish because they either cannot or do not want to lower the policy rate. The activity level in the economy will, as a result, be lower than what the central bank wants. In that case, a more expansionary fiscal policy will not lead to a higher policy rate because the central bank will desire an increase in the activity level in the economy, and as a result, will not be counteracted by an increase in the policy rate.



A common conception through the last decade has been that fiscal policy should follow simple, robust rules and be used actively to a limited degree in stabilizing the economy. The pandemic may be a turning point in this regard, as the view is about to change. There is reason to believe that a more active fiscal policy will be used going forward. There are several reasons for this.

One of the main reasons is acknowledging that the room for maneuver in monetary policy is limited compared to previous years. After the financial crisis, several central banks took on a big responsibility to maintain activity and smoothen swings in the economy. The low rates reflect long-term development features such as an aging population, higher savings, increased inequality, and decreasing productivity growth.

This has led to the neutral rate level being lower than before, including when the cyclical developments are balanced. As a result, the policy rates were already at very low levels before the pandemic. The room to reduce interest rates in recessions is therefore lower. The change of view on fiscal policy's role is also a result of increased attention towards structural changes: Economic inequality, shifting towards a greener economy, and the need for investments in digital infrastructure.

## **5.7 Small open economy**

Norway is a small open economy with free capital markets. The consequence is being vulnerable to international economic crises. The financial crisis originated in the US through the credit market in 2008. Although Norway did not have the same weaknesses in its credit market, it was still affected. The outbreak of COVID-19 has had a similar impact on the Norwegian economy. Although COVID-19 has had a severe impact on the economy domestically in Norway, the economy is also exposed to external events. The implication of this is that even if Norway saw no COVID-19 cases and avoided lockdown measures, the economy would still be impacted by other larger economies such as the European Union, the US, and Great Britain. At the same time, Norway's influence on other countries is far less.

With Norway being a small open economy, monetary policy must maintain its competitiveness towards foreign countries. With this in mind, the policy rate difference between Norway and its trading partners cannot be too large, as it would impact the NOK. A challenge with this is that even if the Norwegian economy is doing well compared to others, other economies must be considered when determining the policy rate. As an example, we look at the rising property prices and increased private consumption in Norway shortly after the financial crisis in 2009. In isolation, this would mean that the policy rate should be increased. However, at the same time, the international policy rate was extremely low. In this example, if the monetary policy did not consider international policy rates, it could lead to lower inflation, a weaker NOK, and a weak labor market.

Norway's economic development is dependent on international demand for Norwegian goods and services. Therefore, a difficult situation can arise when expansionary stimulation packages will have to be reversed, where uncertainty regarding economic development with Norway's trading partners can arise. This could be due to access to credit being more expensive than during the pandemic.

Norwegian trading partners' recovery will be very important for future economic growth. A long-term consequence for the Norwegian export sector could be slow recovery depending on trading partners' ability to recover from the pandemic.

## **5.8 Long-term development**

The long-term sustainability in the public finances assumes that spending slows down exiting the pandemic. Higher budget deficits today weaken the sustainability in the public finances in the long term. Future generations will indirectly pay for the current public spending through higher taxes or lower public spending. On the other hand, a less powerful response to the crisis may have led to a bigger downturn in the economy, more bankruptcies, and higher unemployment - leading to higher long-term costs. The consensus has therefore been that the fiscal response level we have seen in Norway has been warranted.

Bringing unemployed and furloughed workers quickly back to work is crucial for the Norwegian economy to return to a normal situation. This is not a matter of course. Several unemployed during COVID-19 had low education and lacked other formal competence. SSB states that employment falls easier than it increases. This could be due to downsizing during a recession, hitting the least valuable employees for the firms the most. The problem increases the longer the unemployment period lasts; competence, motivation, and self-esteem weaken.

Experiences from earlier major recessions lead us to believe that there will be prolonged negative consequences on employment and the production level in the economy. This could be because people who have been unemployed for a long time stay outside the labor market even when the cyclical situation is normalized (Yagan, 2017). Moreover, a weak labor market may also have prolonged negative effects on young workers (Gould & Kassa, 2020).

Another cause of reduced production potential is that firms reduce investments in physical capital, which leads to a lower level of capital (Hall, 2015). Firms may also reduce investments in technology development and innovation, slowing down the growth in total factor productivity for a period (Anzoategui, et al., 2019). The shutdown of educational institutions may affect the percentage that completes their education and their level of knowledge.

It is worth discussing if unemployment after the pandemic will be reversed faster than previous crises due to unique circumstances. Since the unemployment is due to an abrupt shutdown rather than a gradual decrease in demand, the unemployed are likely to a lesser degree be selected by value for the firm. Several of the furloughed workers will be able to return to the jobs they had, and the demand will increase quickly when activity levels are back to normal.

On the contrary, the pandemic could trigger the potential of new technology, especially parts of the services sector. We have been forced to take advantage of a bigger range of digital tools during the pandemic, both at work and privately. Online shopping has increased considerably (SSB, 2020b). Large and comprehensive processes have been handled from home, with international meetings on video. Many of the solutions in use will benefit us in the future. There are some positive sides to the pandemic.

## 6. Conclusion

COVID-19 has hit both the Norwegian and the global economy hard. The impact on economic variables was severe, specifically for the service sector directly impacted by lockdown measures. However, through the combined efforts of Norwegian monetary & fiscal policy, the economy has been able to recover faster than originally anticipated. Several experts expected the pandemic to last a long time, but with the arrival of the COVID-19 vaccine, the economy is recovering, although at a slow pace. The importance of specifically fiscal aid providing economic stimulus to businesses close to foreclosure has been an important factor in the recovery. This has been possible due to Norway's economic structure, specifically due to the Norwegian pension fund.

As a result of an expansionary policy with increased public spending, future generations will bear some of the costs of this. However, we argue that it could have been far worse for future generations without the powerful approach to alleviating the pandemic. Fiscal & monetary policy has prevented several businesses from going into foreclosure and stimulating the economy when needed. Reducing spending of the pension fund is crucial as we are currently eating into future generations' money. We argued that the budgetary rule is currently too lenient, and reconsideration is needed. Increased spending during the pandemic has been justified, but looking past the times of the pandemic, discussions should be held regarding this issue.

Extraction of oil and gas services has been one of the main income sources for the public sector. Considering the size of the Norwegian public sector and the depletion of oil and gas, a long-term crisis arises as a result. Currently, the public sector is responsible for two-thirds of value creation in Norway. Additionally, with a continuous expansionary fiscal policy, the size of the public sector will continue to grow. During the pandemic, the private sector furloughed workers as a response to the pandemic. In contrast, public services increased during the pandemic through allocations for health businesses, NAV, and the commune sector. Studies such as Angelopoulos et al. argue that Norway's public sector could harm growth already in 2008. This is a troubling thought, considering growth in recent times, specifically in 2019.

Optimal monetary policy has been an important discussion during the pandemic. It is the Norwegian central bank's objective to react absolutely to economic shocks. The reaction should

aim to balance reaching the inflation rate while also considering real economic stability. Conflicts arise between reaching the inflation target, closing the output gap, and assessing financial stability. It is therefore on the central bank to assess trade-offs between these conflicts. With COVID-19 being a unique economic crisis, in the sense that state-mandated lockdowns and social distancing orders led to output in certain sectors stopping completely, grounds for an expansionary policy were laid down. Furthermore, we argue the output gap in a situation like this is calculated questionably and urge the central bank to reconsider.

Although Norway had reached its business cycle peak where the policy rate was already considered “low” at 1.5 percent at the start of the pandemic, additional cuts in the policy rate were mandated. This resulted in the policy rate reaching zero percent, the lowest it has ever been during inflation targeting. As some countries argue that negative policy rates will have an even more expansionary effect, other studies such as Eggertson et al. (2017) argue that negative policy rates have little to no effect and can potentially lead to a less expansionary policy. A long-term consequence of having such a low policy rate is the dilemma of supporting the real economy and curbing financial imbalances. With debts being easier to acquire, long-term burdens of households and firms may arise.

One of the most crucial factors for economic recovery is reducing unemployment. High unemployment numbers have been uniquely tied to lockdown measures as a result of the pandemic. As vaccines continue to roll out, we expect it to normalize. Whether or not increased long-term unemployment will be a chronic consequence of the pandemic remains to be seen, as it depends on several factors.

We believe the Norwegian government's response to the pandemic has been necessary and appropriate. The necessity of governmental intervention to increase economic activity in a deep recession was unprecedented in a global crisis such as the pandemic. Furthermore, with Norway being a small open economy, cooperation across international borders to develop and distribute the vaccine efficiently is imperative for a swift recovery.

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