

Special Analysis

Alternative scenarios

There are a number of risks which, if they materialise, could be expected to lead to a weaker economic performance in Europe and elsewhere than in the base scenario presented in this report. One such risk is the UK leaving the EU without a deal, which could lead to reduced flows of goods, services and capital between the UK and the rest of the EU. In the NIER's general equilibrium model SELMA, events of this kind can be represented by lower demand for goods and services abroad and so lower demand for Swedish exports than in the base scenario.

We can use SELMA to analyse how alternative assumptions for the Swedish economy might impact on economic developments. In the following, we describe how lower aggregate demand in the foreign economy affects the domestic economy in this model.¹ The size of this effect does, however, depend on how monetary policy and fiscal policy respond to the change in demand abroad. This is analysed in two scenarios below.

In both scenarios, it is assumed that there is a limit to how low policy rates in Sweden and abroad can go.² Both the repo rate and the foreign policy rate reach their respective lower bounds in both scenarios.³ This limits the scope for using monetary policy to stabilise the economy. Given this limited scope, two scenarios with different fiscal policy approaches are presented in order to show how fiscal policy might be used as a complement to monetary policy to stimulate the economy.⁴

Lower foreign demand leads to lower domestic growth in exports, consumption and investment, and so lower growth in GDP. In the first scenario, no discretionary fiscal policy is conducted. In other words, no active fiscal decisions are taken beyond those included in the base scenario and those needed to ensure compliance with the surplus target, operationalised as a structural net lending level of one-third of a percent of potential GDP. It is assumed here that it is transfers that are adjusted so

¹ The foreign economy is represented in the diagrams by the KIX6 countries, i.e. all of the countries in the euro area plus the US, Norway, the UK, Denmark and Japan.

² The effect of an economic downturn in the foreign economy on Sweden when monetary policy is not constrained by a lower bound was analysed in the Swedish version of *The Swedish Economy*, March 2019.

³ The lower bound in Sweden is assumed to be -0.5 per cent. The basis for this assumption is that, when the repo rate was at that level (between 2016 and 2018), the Riksbank chose further quantitative easing over a further reduction in the repo rate. The value of the lower bound for the foreign economy is assumed to be -0.4 per cent, which is a trade-weighted average of the NIER's estimate of the lower bounds for the KIX6 countries.

⁴ In both scenarios, it is assumed that there is no co-ordination between the Riksbank and the government.

What is an alternative scenario?

This chapter presents possible paths for the economy other than those described in the base scenario. It sets out different economic assumptions to the base scenario, and the effects these alternative assumptions might have on the Swedish economy.

The alternative scenarios are analysed using the NIER's general equilibrium model SELMA. The analysis presented is based on the results from the model. It is therefore entirely dependent on the assumptions made in the model.

About SELMA

SELMA is a general equilibrium model based on established economic theory. This means that SELMA captures the relationships between macroeconomic variables and the interaction between them.

The model has two regions: Sweden and abroad. The foreign economy can affect Sweden, but Sweden is assumed to have no effect on the foreign economy because the Swedish economy is small. The Swedish economy in turn consists of two types of household, five types of firms, an independent central bank that conducts monetary policy, and a government sector that conducts fiscal policy.

One type of household has access to financial markets and can therefore borrow and save, while the other does not have access to financial markets, which means that these households consume all of their disposable income, consisting of wages and transfer payments.

Firms produce export goods, capital goods and consumption goods. These firms use intermediate goods which are either produced by other domestic firms or imported. Pricing by producers of intermediates and by exporters is assumed to be sticky.

The Swedish central bank – the Riksbank – conducts monetary policy with a view to stabilising inflation around the target level. It also attaches some importance to the output gap. All else equal, the repo rate will be set higher if the output gap is positive, and lower if it is negative.

Fiscal policy can be conducted via a number of fiscal instruments, such as increasing or decreasing transfers to households, raising or lowering tax rates, and increasing or decreasing government consumption.

The foreign economy is modelled using the same principles as the Swedish economy, but the structure is simplified. SELMA has been calibrated to reflect how the Swedish economy functions. It is a quarterly model, even though the results in the scenarios are presented as annual growth rates.

For a more detailed description of SELMA, see "SELMA – Technical documentation" at www.konj.se.

that the surplus target is met.⁵ In the second scenario, the government uses discretionary spending to counteract the negative effects of lower foreign demand on the Swedish economy. The government counters the economic downturn by increasing its consumption for two years, with the result that structural net lending falls below one-third of a percent of potential GDP in those same two years. After that, it is assumed that transfers are adjusted in such a way that the surplus target is reached. This fiscal stimulus leads to both higher government consumption and higher household consumption, thus halving the downturn in Swedish GDP growth.

A GLOBAL ECONOMIC DOWNTURN

The lower aggregate demand in the foreign economy causes firms abroad to reduce their production relative to the base scenario. Foreign GDP in 2020 falls rather than rises as it does in the base scenario (see Diagram 22). The downturn is expected to be temporary, which means that GDP growth is higher than in the base scenario for a few years after 2021 as the economy recovers. Global inflation also slows in 2020. Lower production leads to lower demand for labour, and in turn to lower wage growth. This means that firms' costs fall, and they raise their prices more slowly. Foreign inflation is therefore lower than in the base scenario (see Diagram 23). The lower inflation and GDP growth prompt central banks to lower their policy rates (see Diagram 24). However, the foreign policy rate reaches its lower bound in this scenario. Given foreign inflation and GDP growth, this lower bound is a binding constraint. In other words, foreign central banks would want to lower their policy rates further than they are able to. This means that they are unable to stimulate the economy to the extent that they would wish, exacerbating the economic downturn.

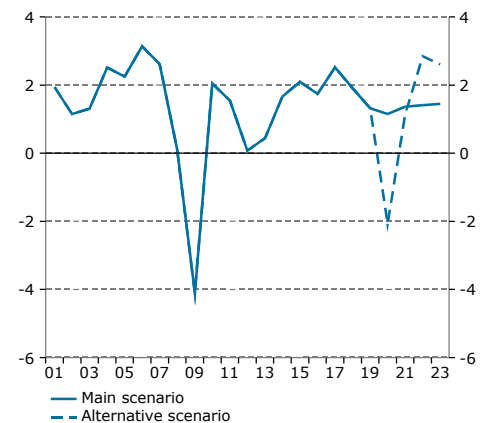
The decrease in aggregate demand means that GDP in the foreign economy falls by 2.1 per cent in 2020. In Sweden, GDP increases by 0.1 per cent in 2020. This can be compared with the growth rates seen during the financial crisis in 2009, when GDP in both the KIX6 countries and Sweden fell by 4.1 per cent.

Part of the reason why foreign GDP and inflation fall further than domestic GDP and inflation is that no account is taken of effects through confidence channels and some financial channels (such as falling share prices) in the scenarios. The scenarios described here include only the effects of the decrease in foreign demand on Swedish exports and the reduction in foreign policy

⁵ This fiscal policy is an example and should not be viewed as the NIER's position on what might be the most appropriate fiscal response.

Diagram 22 World GDP

Percentage change, constant prices

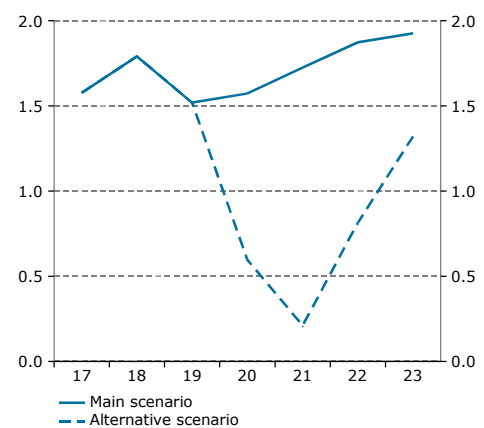


Note. The world is represented by KIX6.

Sources: OECD, Eurostat, Macrobond and NIER.

Diagram 23 World inflation

Per cent

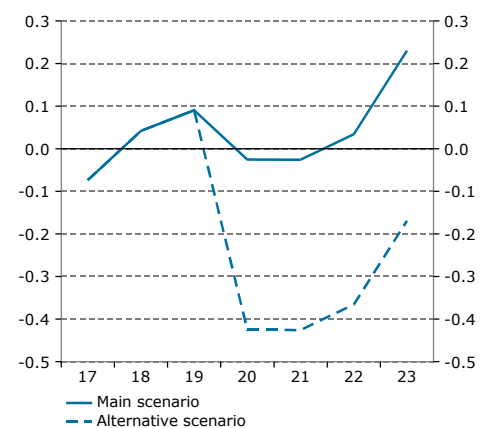


Note. The world is represented by KIX6.

Sources: OECD, Eurostat, Macrobond and NIER.

Diagram 24 World policy rate

Per cent



Note. The world is represented by KIX6.

Sources: Bank of England, Bank of Japan, ECB, Federal Reserve, Norges Bank, Macrobond and NIER.

rates. Were confidence channels and these financial channels also to be taken into account, domestic GDP growth and inflation would be much lower.

How the domestic economy is affected by this lower foreign demand depends partly on how monetary policy and fiscal policy respond. The following therefore presents two alternative scenarios with different fiscal policy responses to illustrate the impact on the Swedish economy. In both scenarios, monetary policy in Sweden is also restricted by the policy rate reaching its lower bound. This means that the Riksbank is unable to cut the repo rate as far as it would wish. Since monetary policy is constrained, fiscal policy becomes the most important instrument for counteracting the negative consequences of lower foreign demand for the Swedish economy, such as lower consumption and lower GDP growth. Research also supports the view that fiscal policy is more effective in stabilising the economy when policy rates have reached their lower bound.⁶

In both of the alternative scenarios described below, the automatic stabilisers in the Swedish economy are modelled. This means that rule-based government revenue and expenditure automatically put a damper on the cyclical effects on households and firms through higher transfers and lower tax revenue in an economic downturn, and lower transfers and higher tax revenue in an upswing. Examples of these automatic stabilisers include unemployment benefits and revenue from value-added tax and taxes on labour. It is also assumed that transfers to households are the instrument used to keep structural net lending in line with the surplus target. In the first scenario, with no discretionary fiscal policy, the government takes no discretionary fiscal action beyond adjusting transfer payments to households. In other words, no active fiscal decisions are taken to counter the negative effects of lower demand abroad on the Swedish economy.

This lower foreign demand results in lower exports and so lower demand for domestic intermediates⁷ than in the base scenario. Household consumption decreases, and investment is lower than in the base scenario. All of this means that GDP growth in the Swedish economy in 2020 falls to 0.1 per cent as opposed to 0.8 per cent in the base scenario (see Diagram 25), and the output gap is appreciably negative in 2020-2021 (see Diagram 26).

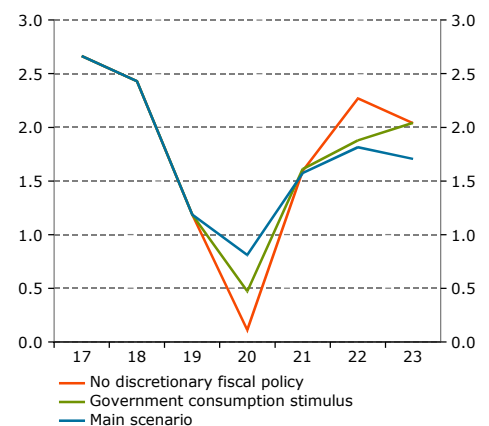
In the second scenario, with increased government consumption, a stimulus package is introduced that results in a temporary

⁶ See, for example, Eggertsson, G. "What fiscal policy is effective at zero interest rates?", in Acemoglu, D. and Woodford M. (eds.), *NBER Macroeconomics Annual 2010*, vol. 25, University of Chicago Press, 2011.

⁷ Intermediates refers to both goods and services used as inputs to production.

Diagram 25 Swedish GDP

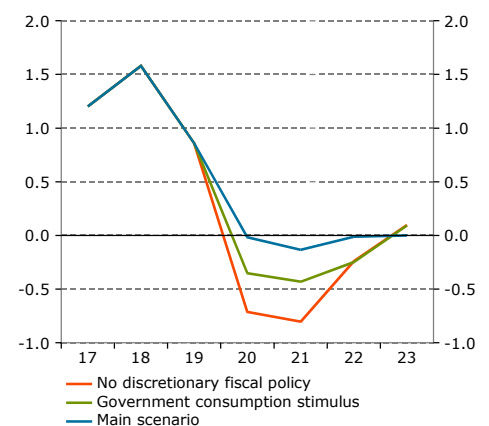
Percentage change, constant prices, calendar-adjusted values



Sources: Statistics Sweden and NIER.

Diagram 26 Swedish GDP gap

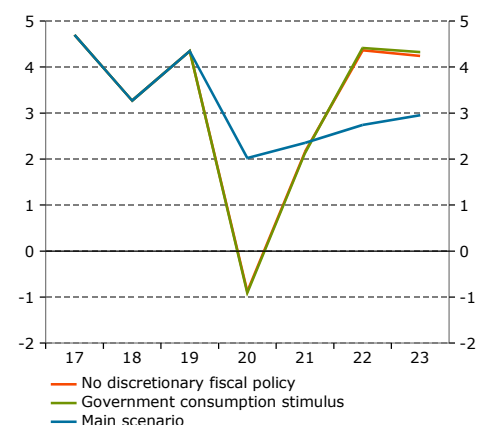
Per cent of potential GDP



Source: NIER.

Diagram 27 Swedish exports

Percentage change, constant prices, calendar-adjusted values



Sources: Statistics Sweden and NIER.

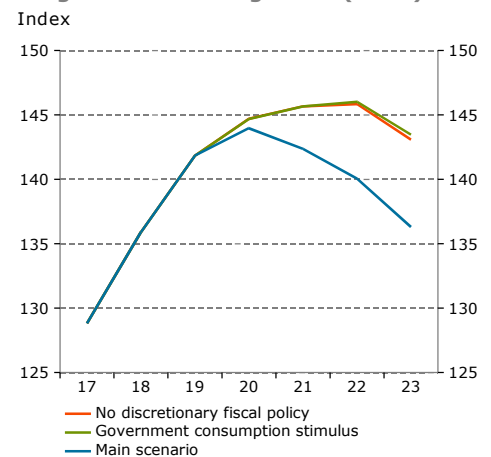
rise in public spending. Government consumption is then 1.2 per cent higher than in the scenario with no discretionary fiscal policy for two years, which corresponds to around SEK 15 billion per year. At the same time, structural net lending is permitted to fall below one-third of a percent of potential GDP during these two years. The stimulus package helps stabilise domestic GDP growth, with the result that the slowdown is only around half of that in the scenario with no discretionary fiscal policy, and the output gap is less negative. This happens partly as a direct consequence of the rise in government consumption, but also through higher household consumption. Since household consumption increases, so does tax revenue from that tax base. Labour income is also higher as a result of more hours worked and higher wages. Government revenue from taxes on labour therefore increases. All in all, primary revenue is higher as a result of the fiscal stimulus than in the scenario with no discretionary fiscal policy, which means that the increase in the Maastricht debt from the increase in government consumption is only marginal.

SCENARIO: NO DISCRETIONARY FISCAL POLICY

This scenario is illustrated by the red line in the diagrams. The lower foreign demand compared to the base scenario means that demand for Swedish exports is lower than in the base scenario (see Diagram 27). The drop in exports is softened by the krona depreciating (see Diagram 28). The exchange rate is affected partly by differences in the interest rate path relative to abroad, and partly by changes in Sweden's net foreign asset position. Since the differences in the interest rate path are relatively small as a result of interest rates both in Sweden and abroad reaching their respective lower bounds (and these bounds being around the same level), the main reason for the depreciation is reduced demand for the krona as Sweden exports less. The decreased demand for Swedish exports undermines demand for Swedish intermediates, which means that domestic producers of intermediates need less labour than before (see Diagram 29). Due to the weaker demand for labour, wage growth is also lower (see Diagram 30).

CPIF inflation can be divided into a domestic component and an imported component. Domestic inflation decreases because firms' costs fall with lower wage growth. Imported inflation is also lower, because the economic downturn abroad leads to lower foreign inflation. This is, however, offset to some extent by the weaker krona. Since both domestic and imported inflation are lower, CPIF inflation is lower than in the base scenario (see Diagram 31).

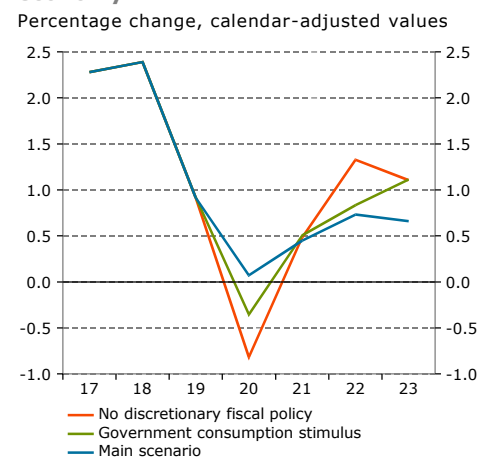
Diagram 28 Exchange rate (KIX6)



Note. A higher index corresponds to a weaker krona.

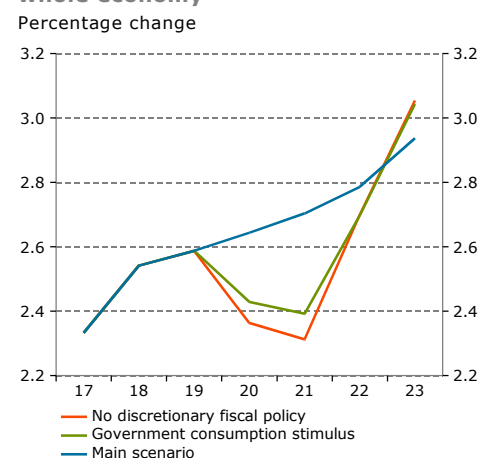
Sources: The Riksbank and NIER.

Diagram 29 Hours worked in the whole economy



Sources: Statistics Sweden and NIER.

Diagram 30 Hourly earnings in the whole economy



Sources: National Mediation Office and NIER.

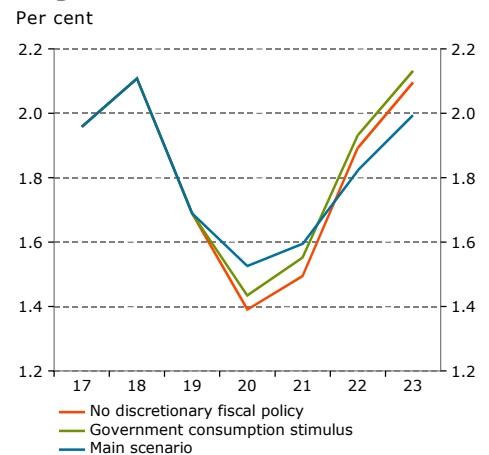
Due to the lower inflation and lower GDP growth, the Riksbank cuts the repo rate, which is then lower than in the base scenario (see Diagram 33). However, the lower bound for the repo rate means that it cannot be reduced as far as the Riksbank would wish. The lower bound binds for around two years. The Riksbank starts to raise the repo rate again in late 2021, and it is higher than in the base scenario from late 2022. The repo rate rises because CPIF inflation is higher than in the base scenario from 2022.

SELMA differentiates between two types of households: those with access to financial markets, who can borrow and save, and those without access to financial markets.⁸ A decrease in foreign demand leads to lower wages and reduced demand for labour, and so temporarily lower labour income for households compared to the base scenario. In this model, households with savings will then save less or borrow more to maintain their consumption. Lower interest rates also make it cheaper for households to borrow. However, since the Riksbank is limited in how far it can reduce the repo rate, the reduction is not sufficient to offset the negative effect of the decrease in foreign demand. Another reason why households with savings reduce their consumption is that interest rates are higher than in the base scenario from 2022. Households without savings have less disposable income because their labour income falls, and so they reduce their consumption. Since both households with savings and households without savings reduce their consumption, household consumption is lower than in the base scenario (see Diagram 32). If the Riksbank and central banks abroad were not constrained by their respective lower bounds, policy rates would be cut further, and households with savings would instead increase their consumption relative to the base scenario. Consumption by households without savings would still decrease, but to a lesser extent than in the case with a lower bound. All in all, consumption would be higher than in the base scenario without the lower bounds for policy rates.

Domestic producers of intermediates use labour and capital in their production. Since demand for domestic intermediates decreases, these firms' demand for capital is lower than in the base scenario. Investment growth is therefore lower than in the base scenario (see Diagram 34). The lower bounds for policy rates play a similar role here as with household consumption. Without a lower bound, investment growth would be higher than in the base scenario.

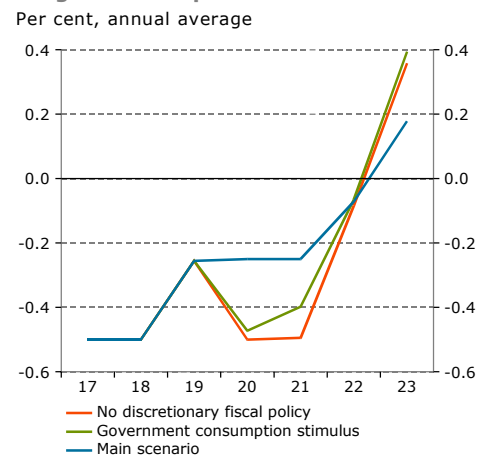
⁸ See the box "About SELMA".

Diagram 31 CPIF-inflation



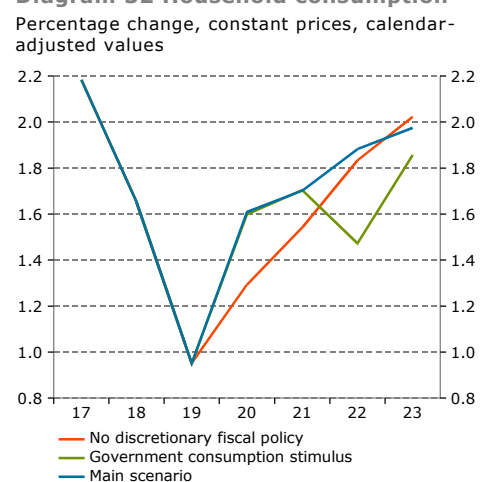
Sources: Statistics Sweden and NIER.

Diagram 33 Repo rate



Sources: The Riksbank and NIER.

Diagram 32 Household consumption



Sources: Statistics Sweden and NIER.

Since growth in household consumption and investment, which both depend partly on imported intermediates, decreases, so does import growth (see Diagram 35).

Once the repo rate and the foreign policy rate have reached their lower bounds, household consumption, investment and exports will be lower than in the base scenario and thus explain why GDP growth is lower than in the base scenario and why the output gap is negative for three years. Without the lower bounds for policy rates in Sweden and abroad, GDP growth would still be lower than in the base scenario, but higher than in this scenario. The output gap would still deteriorate but would be less negative.

Since the output gap is negative, there is an increase in transfers to households via the automatic stabilisers (see Diagram 36). This cushions the fall in household disposable income as a result of households' lower labour income.

Lower consumption and lower labour income lead to lower tax revenue and so lower primary government revenue than in the base scenario. At the same time, primary government expenditure increases as a result of increased transfers to households. All in all, reduced revenue and increased expenditure lead to a higher Maastricht debt than in the base scenario (see Diagram 38). Structural net lending is calculated to reflect what government net lending would be if capacity utilisation in the economy were balanced (zero output gap).⁹ Structural net lending will not be affected appreciably by an economic downturn in Sweden caused by lower foreign demand (see Diagram 37).¹⁰

To sum up, lower foreign demand leads to lower exports and so lower demand for domestic intermediates than in the base scenario. This causes hours worked to fall and hourly wages to rise more slowly. A negative output gap and lower inflation cause the Riksbank to cut the repo rate. The Riksbank is limited, however, in how far it can lower the repo rate. Household consumption and investment therefore decrease relative to the base scenario. Together with lower exports, this leads to lower GDP growth.

SCENARIO: INCREASED GOVERNMENT CONSUMPTION

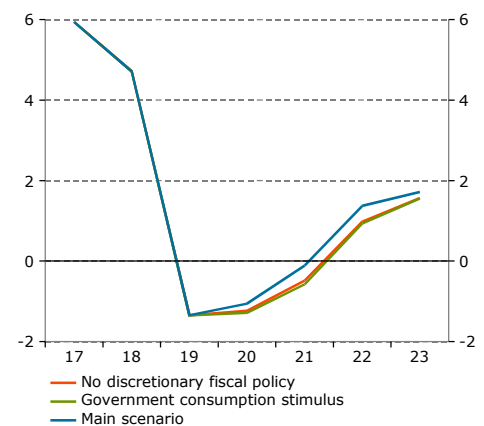
In the scenario above, the Riksbank is unable to make monetary policy sufficiently expansionary to counter the negative effects of lower foreign demand on Swedish GDP to the extent that it

⁹ One exception is capital costs on government debt, which are not adjusted for business cycle effects.

¹⁰ Higher Maastricht debt results in slightly higher interest costs which need to be covered, but the effect on transfers is negligible.

Diagram 34 Investments

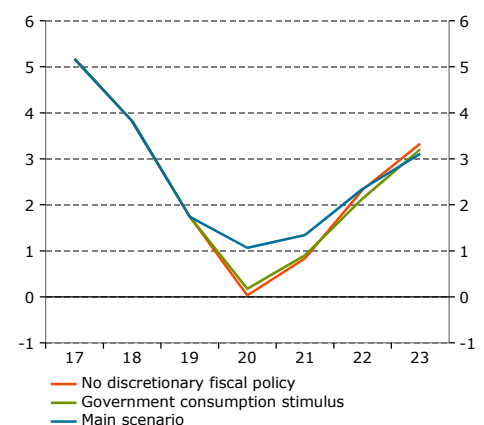
Percentage change, constant prices, calendar-adjusted values



Sources: Statistics Sweden and NIER.

Diagram 35 Swedish imports

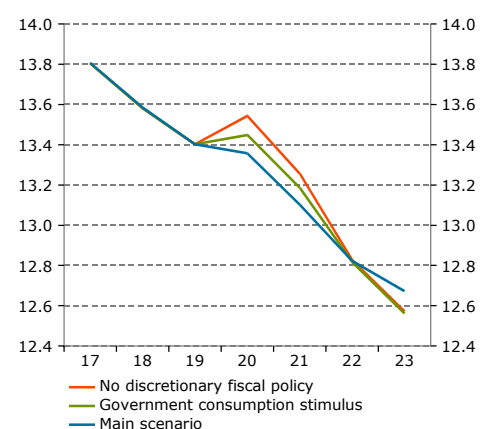
Percentage change, constant prices, calendar-adjusted values



Sources: Statistics Sweden and NIER.

Diagram 36 Transfers to households

Per cent of GDP



Sources: Statistics Sweden and NIER.

would wish. Other instruments are therefore needed to stimulate the economy, such as fiscal policy. In this second scenario, a fiscal stimulus package is introduced whereby government consumption is 1.2 per cent higher than in the scenario with no discretionary fiscal policy for two years, 2020 and 2021. This corresponds to consumption in each of these two years being around SEK 15 billion higher in constant prices compared to the base scenario. In 2022, the stimulus package is withdrawn, and government consumption returns to the scenario with no discretionary fiscal policy. Government consumption therefore needs to increase more slowly in 2022 (see Diagram 39).

It is also assumed in this scenario that the government does not adjust transfers in 2020 and 2021 to maintain structural net lending in those years in line with the guideline (of one-third of a percent of potential GDP in a normal economic climate).¹¹ In other words, the deficit in public finances caused by the increase in government consumption in 2020 and 2021 is debt-financed.

The fiscal stimulus means that the slowdown in GDP growth is only half what it was in the scenario with no discretionary fiscal policy in those two years. This scenario is illustrated by the green line in the diagrams.

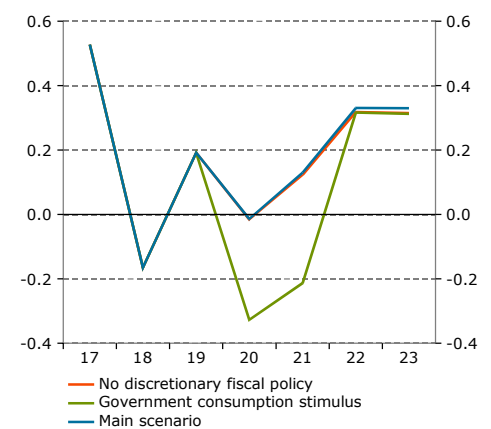
Household consumption is higher than in the scenario with no discretionary fiscal policy and grows at the same rate as in the base scenario in both 2020 and 2021 (see Diagram 32). The rise in government consumption is assumed to boost the propensity to consume among households with savings.¹² They therefore increase their consumption. Households without savings also increase their consumption relative to the scenario with no discretionary fiscal policy, because hours worked and hourly wages are higher, boosting household disposable income.

CPIF inflation can be divided into a domestic component and an imported component. The greater demand for private and government consumption leads domestic producers of intermediates to raise their prices, resulting in higher domestic inflation than in the scenario with no discretionary fiscal policy. Prices on imports for household consumption do not differ appreciably between the two scenarios in 2020–2021. CPIF inflation therefore increases (see Diagram 31).

Although inflation and GDP growth are higher than in the scenario with no discretionary fiscal policy, the Riksbank would

Diagram 37 Structural net lending in general government

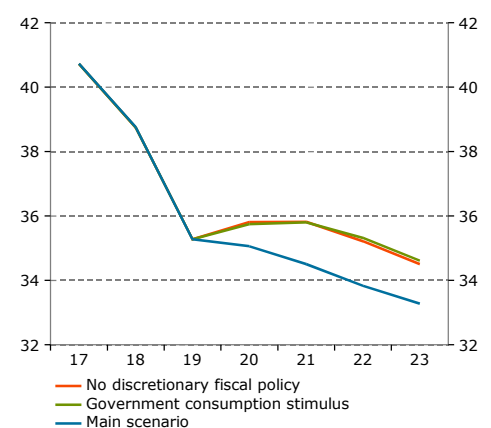
Per cent of potential GDP



Source: NIER.

Diagram 38 Maastricht debt

Per cent of GDP



Sources: Statistics Sweden and NIER.

¹¹ Note that this policy is in keeping with the fiscal framework, because the economy is now operating below capacity (negative output gap). In such a situation, structural net lending is permitted to depart from the guideline of one-third of a percent of potential GDP.

¹² Similar assumptions are made in other models of the same type. See, for example, Coenen G., Straub R. and Trabandt M., "Gauging the effects of fiscal stimulus packages in the euro area", *Journal of Economic Dynamics and Control* 37(2), 2012, pp. 367-386.

still want a repo rate below the lower bound during part of 2020 and 2021. However, it takes slightly longer for the repo rate to reach the lower bound than in the scenario with no discretionary fiscal policy, and the repo rate leaves the lower bound again slightly earlier. The lower bound therefore binds only for part of 2020 and part of 2021.¹³ The difference in the repo rate between the scenarios is not that great, but it does entail a slightly higher interest rate path (see Diagram 33). Since the interest rate path is close to that in the scenario with no discretionary fiscal policy, the exchange rate does not differ appreciably between the two scenarios (see Diagram 28). The strengthening of the krona that nevertheless occurs as a result of the slightly higher repo rate is counteracted by a slight deterioration in the net foreign asset position.

Domestic producers of intermediates use labour and capital in their production. Although demand for domestic intermediates is higher, investment growth is around the same as in the scenario with no discretionary fiscal policy (see Diagram 34). There is a substitution from capital to labour in the production of these goods, and monetary policy is a little less expansionary than in the scenario with no discretionary fiscal policy.

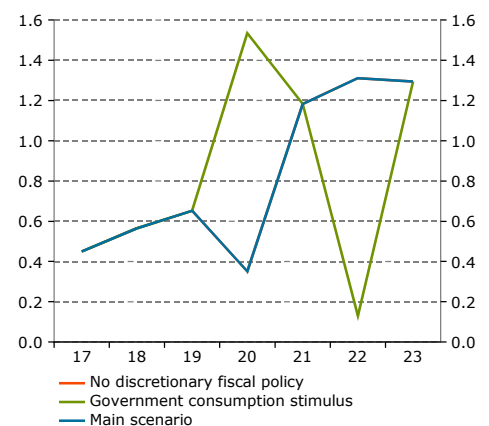
Since the exchange rate and foreign demand are unchanged, exports are also unchanged from the scenario with no discretionary fiscal policy (see Diagram 27). Imports rise, however, because household consumption – met partly using imported intermediates – increases.

To sum up, GDP growth is higher in 2020 and 2021 than in the scenario with no discretionary fiscal policy (see Diagram 25). The slowdown in export growth is the same in both scenarios, but GDP growth is boosted by higher domestic consumption. Meanwhile, higher imports put a slight damper on growth.

Unemployment

SELMA models the number of hours worked in the economy but not unemployment. To estimate how unemployment might move in the two alternative scenarios, certain assumptions must be made. First, it is assumed that an increase/decrease in hours worked leads to a corresponding increase/decrease in employment. In other words, the number of hours worked per employee is assumed to be constant. For example, if hours worked increase by 2 per cent, employment too increases by 2 per cent. The second assumption that needs to be made concerns how the

Diagram 39 Government consumption
Percentage change, constant prices, calendar-adjusted values



Sources: Statistics Sweden and NIER.

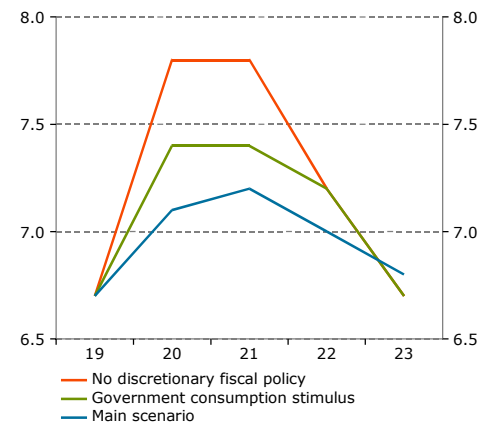
¹³ Note, however, that Diagram 32 presents the annual averages and so does not show the lower bound binding for part of 2020 and part of 2021.

increase/decrease in employment affects the labour force. It is assumed here that for each 1 percent that employment increases/decreases, the labour force increases/decreases by 0.25 percent, which would be a reasonable cyclical response from the labour force. Given these assumptions, the change in unemployment can be estimated on the basis of the change in hours worked in both of the alternative scenarios.

In the scenario with no discretionary fiscal policy, unemployment is 0.7 percentage points higher compared to the base scenario in 2020, and 0.6 percentage points higher in 2021 (see Diagram 40). It then falls and is lower than in the base scenario in 2023. In the scenario with an increase in government consumption, unemployment is 0.4 percentage points lower compared to the scenario with no discretionary fiscal policy in both 2020 and 2021. The stimulus package thus more than halves the rise in unemployment that results from a downturn in foreign demand.

Diagram 40 Unemployment

Per cent of labour force



Sources: Statistics Sweden and NIER.

The stronger demand for domestic intermediates means that domestic producers of these goods increase their demand for labour, and so the number of hours worked rises (see Diagram 29). The increase in demand for labour, together with higher inflation, leads to higher hourly wages than in the scenario with no discretionary fiscal policy (see Diagram 30).

Transfers to households are lower than in the scenario with no discretionary fiscal policy, because the output gap is less negative (see Diagram 36). However, the rise in government consumption means that primary government expenditure is higher compared to the scenario with no discretionary fiscal policy. On the revenue side, tax revenue increases as a result of higher household consumption and labour income pushing up revenue from these tax bases. Since GDP growth and inflation are also higher, however, primary government revenue is not much different as a share of GDP compared to the scenario with no discretionary fiscal policy. Maastricht debt does not, however, differ particularly as a share of GDP from the scenario with no discretionary fiscal policy (see Diagram 38), due to the higher nominal GDP growth.

Structural net lending is lower in 2020-2021 as a consequence of higher government consumption pushing up expenditure. From 2022, the fiscal stimulus is withdrawn, which means that structural primary expenditure moves back in line with the scenario with no discretionary fiscal policy. Structural net lending is

therefore in line with the guideline of one-third of a percent of potential GDP from 2022 (see Diagram 37).¹⁴

To sum up, the scenario shows that a temporary increase in government consumption could be an effective way of stabilising GDP growth in a situation where the Riksbank can only help stabilise the economy to a limited extent as a result of the repo rate reaching its lower bound. The increase in government consumption results in higher GDP growth and higher inflation compare to the scenario with no discretionary fiscal policy. The increase in Maastricht debt as a share of GDP is also minor under these assumptions. If the repo rate remains at a level close to the lower bound for a long period, and the Riksbank therefore has limited room for manoeuvre, fiscal policy becomes an important instrument in stabilising the economy in an economic downturn. At the same time, the Riksbank is still in a position to stabilise an economy in an upturn. Taken together, this could have implications for the surplus target.

¹⁴ Given that interest payments on Maastricht debt are at the same level as in the scenario with no discretionary fiscal policy, there is no need for any further cuts in transfers to households to meet the surplus target beyond those in that scenario.