

Alternative scenarios and uncertainties

The Central Bank's baseline forecast reflects what is viewed as the most likely outcome during the forecast horizon. The economic outlook is uncertain, however, and could change in response to changes in key assumptions underlying the forecast. Chief among them is the assessment of contractual wage increases over the forecast horizon. It has now been established that the provisions of the spring 2019 wage settlements concerning supplemental pay rises linked to GDP per capita growth will be activated. This will affect domestic economic activity, as is discussed in this Box.

There is considerable uncertainty about how much wages will rise during the forecast horizon, however, as most private sector wage agreements are set to expire this coming November. Added to this are a number of other uncertainties that could impact the economic outlook, that include the war in Eastern Europe, lingering issues relating to the COVID-19 pandemic, and the pace at which the production bottlenecks that have shaken the global economy are unwound.

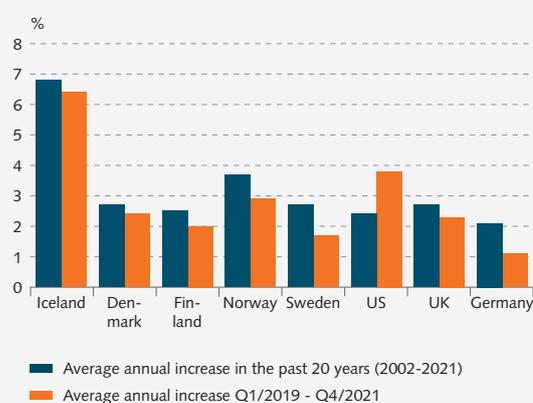
Alternative scenario: The economic impact of the GDP growth wage supplement

Icelandic wages have risen steeply in international comparison ...

The general wage index compiled by Statistics Iceland rose by nearly 20% between early April 2019, the effective date of the most recent private sector wage agreements, and year-end 2021. This corresponds to an average annual increase of 6.7% over this scant three-year period. The wage index for the private sector has risen similarly, as have wages in the manufacturing sector, which are commonly used in international comparisons. As Chart 1 indicates, this is a much larger increase than in other advanced economies over the same period: it was three times larger than in the UK and the other Nordic countries, and nearly six times more than in Germany. Examining a longer period gives similar results: over the past twenty years, wages in the manufacturing sector have also risen by an average of nearly 7% per year in Iceland, almost three times the average in other advanced economies.¹

1. Wage statistics for the manufacturing sector in Iceland extend only back to 2005, but other wage statistics covering the entire twenty-year period give the same result. The general wage index has risen by an average of 6.8% per year over the past two decades, and the private sector wage index has risen by 6.9%.

Chart 1
Wage increases in the manufacturing sector¹



1. Increases in wages per hour in manufacturing. Quarterly data are seasonally adjusted. Data for Iceland extend back to 2005.

Source: OECD.

... and well in excess of productivity growth ...

Icelandic wages have also risen well in excess of realistic expectations of average productivity growth. As Chart 2 shows, labour productivity has increased by an average of 1½-1½% per year in the past decade, depending on whether the measurement is based on GDP per hour worked according to the Statistics Iceland labour force survey (LFS) or gross factor income per hour worked according to the labour volume measurement in the national accounts.² Over this same period, nominal wages have risen by an average of 6½-7% per year, depending on whether they are measured in terms of the general wage index or the total wage index, which measures all taxable wages per hour and not merely regular wages, as the wage index does (see Box 4 in *Monetary Bulletin* 2018/4).

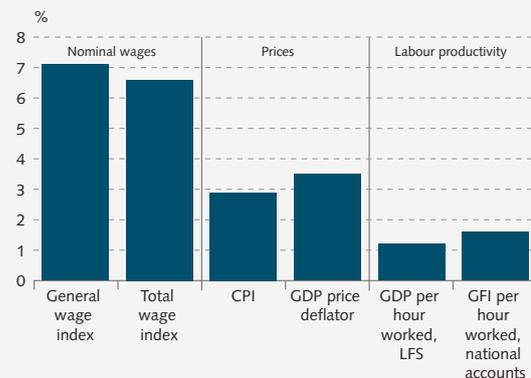
... putting pressure on demand and inflation

In the long run, nominal wages rise in line with inflation plus productivity growth. Nominal pay rises over and above productivity growth in recent decades have therefore put pressure on demand and inflation, as wages have risen by an average of 2½-3½ percentage points more per year than is consistent with the Central Bank's 2½% inflation target plus the 1½-1½% productivity growth measured over the period.³

As Chart 2 illustrates, inflation in terms of the consumer price index has averaged 2.9% per year in the past decade. In terms of the GDP price deflator, it has been somewhat higher, or 3.5%. Inflation has therefore been relatively moderate over this ten-year period, even though wages have risen well in excess of productivity growth. A major factor in this is the 14% improvement in terms of trade in between 2014 and 2017. It has also been necessary to tighten monetary policy somewhat in order to offset these underlying inflationary pressures. This is reflected in the fact that the Bank's key rate was above the neutral rate for the majority of the period. The decline in long-term inflation expectations and a firmer anchor to the inflation target have also helped.⁴

Chart 2

Developments in wages, prices, and productivity in the past decade¹



1. The chart shows the average annual increases in the past ten years (2012-2021) for wages (general and total wage indices), prices (CPI and GDP price deflator), and labour productivity (GDP per hour worked based on Statistics Iceland labour force survey (LFS) and gross factor income (GFI) per hour worked based on labour volume in the national accounts).

Sources: Statistics Iceland, Central Bank of Iceland.

2. The latter measure of productivity extends only back to 2008. The present discussion is therefore based on the past decade – i.e., 2012-2021 – which corresponds to approximately one business cycle that includes the post-crisis recovery and the pandemic-driven contraction. For the period from 2008 onwards, annual productivity growth averages 1.7% instead of the 1.6% depicted in Chart 2.

3. Furthermore, there are signs that long-term productivity growth has slowed to around 1% in Iceland in recent years as it has in other advanced economies (see Box 3 in *Monetary Bulletin* 2021/2).

4. See, for example, Thórarinn G. Pétursson (2022), "Long-term inflation expectations and inflation dynamics", *International Journal of Finance and Economics*, 27, 158-174.

The GDP growth supplement

The wage agreements of April 2019 entailed sizeable pay rises over the term of the contracts. In addition, they provided for additional pay hikes if GDP per capita in the preceding year exceeded a specified threshold, as can be seen in Table 1 (for further information, see Box 4 in *Monetary Bulletin* 2019/2).

Table 1 GDP growth supplement provision in wage agreements

Annual change in GDP per capita	Supplement added to pay scale (kr.)	Supplement added to monthly wages (kr.)
1.00-1.50%	3,000	2,250
1.51-2.00%	5,500	4,125
2.01-2.50%	8,000	6,000
2.51-3.00%	10,500	7,875
More than 3%	13,000	9,750

Sources: Private sector wage agreements.

According to Statistics Iceland estimates from February 2022, GDP per capita growth contracted by 8.6% in 2020. In 2021, however, it grew by just over 2.5%, and according to the Bank's baseline forecast, it looks set to grow by 2.6% this year (Chart 3). This would activate the GDP growth supplement both this year and next, even though GDP per capita in 2021 was a full 6% below the average in 2019, the year the contracts were finalised, and will still be nearly 4% below the 2019 level this year.

The economic impact of the GDP growth supplement

In order to estimate the impact these GDP growth supplement-generated pay rises have on the domestic economy, the Bank's dynamic stochastic general equilibrium (DSGE) model, DYNIMO, is used.⁵ This allows the examination of the general equilibrium effects the wage rises will have on inflation and aggregate demand, including labour demand.

Based on Statistics Iceland's estimates of GDP growth per capita in 2021 and the GDP growth supplement provision in the wage agreements as depicted in Table 1, it can be seen that the second-highest GDP growth supplement rate will be triggered this year. If the Bank's forecast of 2022 GDP growth per capita is borne out, the same will happen again in 2023. According to the provisions of the wage agreements, the supplement is to be paid in May 2022 and May 2023 and is also assumed to apply to public sector employees. This corresponds to an additional increase in annual average wages

5. See Stefán Thórarinnsson (2020), "DYNIMO – Version III. A DSGE model of the Icelandic economy", Central Bank of Iceland, *Working Paper*, no. 84. A brief discussion of the main characteristics of the model and a comparison with the Bank's other macroeconomic model, QMM, can be found in Box 2 in *Monetary Bulletin* 2021/4.

Chart 3
GDP per capita 2018-2024¹



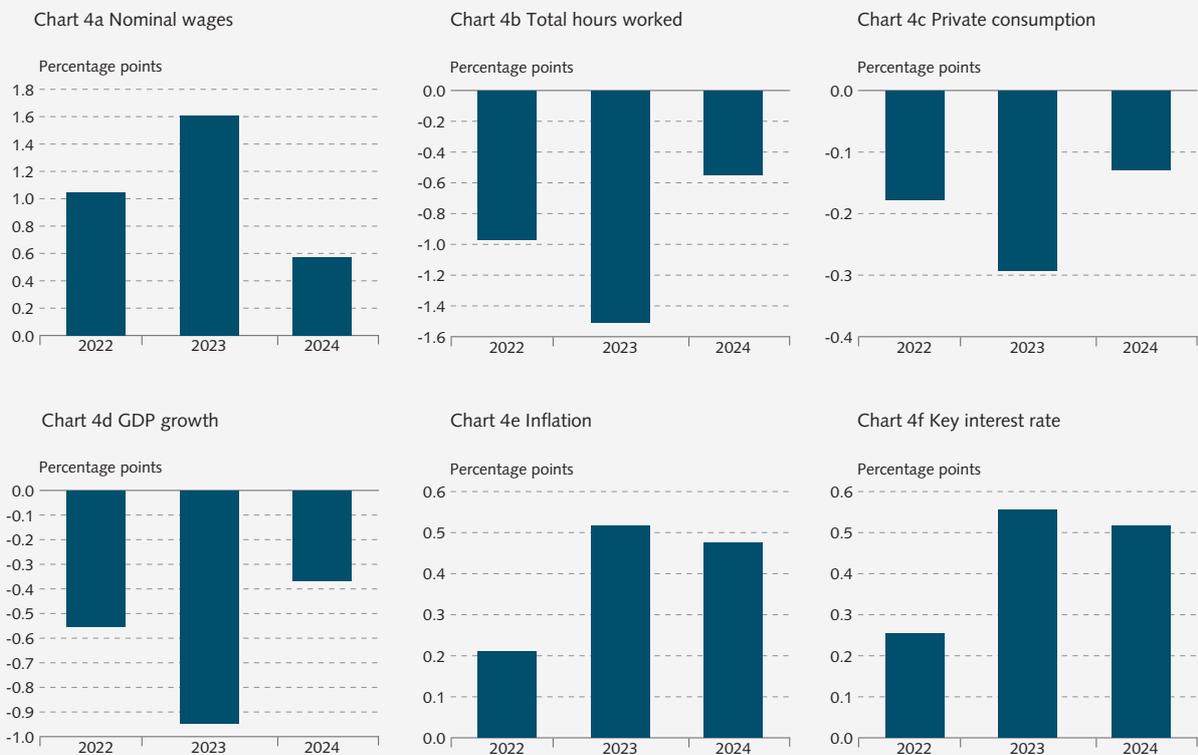
1. Chain-linked value of GDP relative to average population for the year. Average population for the year is estimated as the average at the beginning of the year and the beginning of the following year. Central Bank baseline forecast 2022-2024. Sources: Statistics Iceland, Central Bank of Iceland.

of 1 percentage point in 2022 and 1½ percentage points in 2023 (Chart 4a). Over the forecast horizon, the total pay increase due to the GDP growth supplement will come to nearly 3 percentage points.

More rapid pay hikes will increase firms' marginal costs, leading to higher product prices unless firms either absorb the extra costs through lower profit margins or streamline to compensate, such as by reducing labour demand through shorter working hours or downsizing. As Chart 4b indicates, the jump in wage costs due to the GDP growth supplement will cause total hours worked to increase more slowly than they would otherwise: 1 percentage point more slowly in 2022, and 1½ percentage points more slowly in 2023. By the end of the forecast horizon, total hours worked will therefore be 2½% fewer than they would have been without the GDP growth supplement. Higher nominal wages will therefore be offset by a poorer employment outlook, compounded by the negative impact of higher interest rates and inflation (see below), which will reduce real disposable income by 1% by the end of the forecast horizon. Households' consumption spending will therefore increase more slowly over the entire period, and by the end of the forecast horizon, private

Chart 4

Alternative scenario: Effects of wage rises due to GDP growth supplement¹



1. The charts show the deviation between the baseline forecast and a forecast that excludes the GDP growth supplement.
Source: Central Bank of Iceland.

consumption will be ½% lower than in a scenario where the GDP growth supplement is not activated (Chart 4c).

Weaker growth in private consumption and investment (due to higher domestic interest rates) will cause domestic demand to grow more slowly than it would otherwise. A higher real exchange rate will also cause external trade to be less favourable, as exports will grow more slowly and a larger share of demand shifts to imports. The GDP growth outlook is therefore less favourable than if the supplement had not been triggered: GDP growth will be weaker by ½ a percentage point this year and nearly 1 percentage point next year (Chart 4d). As a result, the level of GDP will be 1½% lower at the end of the forecast horizon.

Although economic activity will grow more slowly over the forecast horizon than it would otherwise, the GDP growth supplement will exacerbate underlying inflationary pressures causing inflation to subside more slowly to target than otherwise. Inflation will be ¼ of a percentage point higher this year and an average of ½ a percentage point higher in 2023 and 2024 (Chart 4e). The Central Bank will have to respond to these increased inflationary pressures by tightening the monetary stance so as to ensure that inflation is in line with the target over the medium term. According to the monetary policy rule in the model, the Bank's key rate will be an average of ¼ of a percentage point higher this year and ½ a percentage point higher in 2023 and 2024 (Chart 4f).

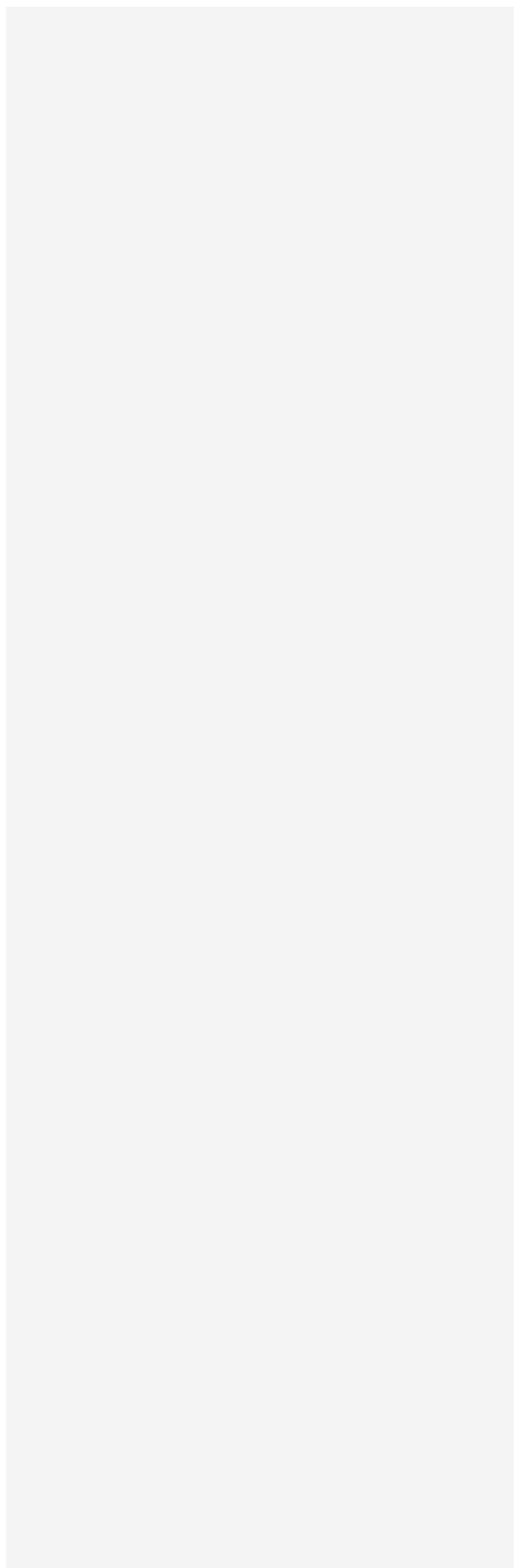
Other uncertainties

Global economic uncertainty has escalated sharply in the wake of Russia's invasion of Ukraine

As is discussed in Box 2 of this report, the war in Ukraine has strongly affected the global economy, not least because of the surge in various commodity prices. The baseline forecast attempts to account for the potential impact of the war on the outlook for commodity markets and on global and domestic economic developments. Significant uncertainty remains, however. It is difficult to estimate how long the war will last and how persistent an impact it will have on international relations and world trade, including how long the sanctions against Russia will remain in effect and what the implications will be for commodity markets, in which Russia plays an important role.

Widespread easing of public health measures, yet a setback in the fight against the pandemic cannot be ruled out

The war broke out in late February, when the end of the aggressive public health measures in response to the COVID-19 pandemic, which had held the global economy hostage



for two years, appeared to be in sight. Although case numbers have continued to rise in many areas – and even more rapidly than in earlier waves of the pandemic – the harmful effects of the disease had clearly diminished. As a result, the authorities in many countries took decisive steps towards lifting restrictions. It is probably still too soon to declare the pandemic at an end, however, as large numbers of people are still unvaccinated in poorer countries and new case numbers remain high. Therefore, there is still the risk that new variants of the virus will emerge and a setback will occur, potentially slowing down global GDP growth once again.

Supply bottlenecks started easing in early in 2022, but risk of setback

The relaxation of public health measures in much of the world boosted hopes of an easing of the severe supply-chain disruptions that have caused supply to lag far behind demand in the markets for commodities and consumer goods over the past year. The strain on supply chains appears to have peaked in mid-2021, but the surge in COVID case numbers in China and the stringent public health measures imposed there may well have caused a setback in the resolution of the bottlenecks (Chart 5). In addition, the war in Ukraine and the economic sanctions on Russia have upended commodity markets, potentially causing renewed supply-chain gridlock.

Inflation outlook highly uncertain; elevated risk of underforecasting

The evolution of the aforementioned factors affects developments in economic activity and inflation in the Bank's forecast. Commodity prices could rise even further, for example, and global inflation could turn out higher and more persistent than currently assumed. Domestic inflationary pressures would therefore be stronger, as is described in the alternative scenario in Box 1 of *Monetary Bulletin* 2021/4.

Added to this is the uncertainty surrounding the wage negotiations slated for this winter. If new settlements provide for even larger pay rises than the baseline forecast assumes, domestic inflationary pressures will unavoidably be stronger than is provided for in the baseline. Furthermore, developments in the exchange rate over the forecast horizon are always uncertain. If terms of trade turn out poorer and the current account deficit widens, the exchange rate assumptions in the baseline forecast could prove overly optimistic. On the other hand, a more rapid recovery of exports and a wider interest rate differential with abroad could lead to a higher exchange rate than is provided for in the baseline.

As has previously been discussed in *Monetary Bulletin*, it has been unusually difficult to estimate Iceland's potential

Chart 5
Strain on global supply chains¹
January 2018 - February 2022



1. Estimated effects of various measures of shipping costs and delivery times on supply chains.
Sources: G. Benigno, et al. (2022), "Global supply chain pressure index: March 2022 update", Federal Reserve Bank of New York *Liberty Street Economics*.

output in the wake of the pandemic and the associated production disruptions and changes in relative prices. This is compounded by even further supply shocks following Russia's invasion of Ukraine. Because of this, the possibility cannot be excluded that potential output has been impaired even more than is assumed in the baseline forecast, and that the output gap that has started to open up – and therefore, the underlying inflationary pressure – is underestimated. Moreover, the output gap could widen more rapidly than is currently projected if households are quicker to tap the significant savings they accumulated in the wake of the pandemic (see the alternative scenario in Box 1 of *Monetary Bulletin* 2021/4). The same applies if the fiscal stance is eased more rapidly than is assumed in the baseline.

Inflation has been above the Central Bank's inflation target for about two years and above 4% since the beginning of 2021. According to the baseline forecast, it will be above target for the entire forecast horizon and above 4% until H2/2023. Such a large deviation from target puts a strain on inflation expectations and increases the risk that they could become unmoored from the target, which in turn could cause higher inflation due to temporary supply shocks to become entrenched. If this happens, inflation could prove more persistent than is currently assumed. This uncertainty is exacerbated by the fact that inflation is higher throughout the industrialised world than it has been in decades.

Although some of these factors could develop more favourably than is provided for in the baseline forecast, the risks to the inflation outlook are tilted more strongly to the upside. Uncertainty is also considered to have increased relative to the Bank's previous forecasts, and the probability distribution is skewed even further to the upside.

