Quantifying the impact of the 2021–22 inflation shock on Austria's public finances

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Higher inflation tends to contribute to higher growth in nominal government revenue, but its overall effect on public finances is ambiguous. We show that while the current inflation shock has a small positive short-run effect on the budget balance, it is clearly detrimental to public finances in the medium to long run. The decline in real economic growth caused by the current inflationary shock aggravates its budgetary impact further. In addition, our results highlight that the recently introduced inflation indexation of income tax brackets and family benefits substantially contributes to the negative impact of higher inflation on public finances.

The recent increase in inflation has contributed to strong growth in government revenue, which, at first glance, can lead to the perception that governments are beneficiaries of high inflation under a no policy-change scenario. A closer look at the budgetary impact of the current inflation dynamics reveals three reasons why this perception is questionable: First, soaring inflation also implies a strong increase in government expenditure. Second, the current inflation shock is clearly detrimental to real economic activity. The corresponding decline in real GDP growth depresses public finances via the effect of automatic stabilizers. Third, the type of shock we see at the moment leads to a large devaluation of personal household incomes, which, in turn, puts pressure on governments to take large-scale expansionary fiscal measures.

In this article, we discuss the effect of inflation on public finances under a no policy-change scenario, i.e. we elaborate on the first two points mentioned in the previous paragraph. The fiscal measures adopted by the Austrian government to ease the financial burden that the exceptionally high inflation rates have created for households and enterprises will not be addressed in this article (for an analysis of these measures, see Prammer and Reiss, 2022). However, our analysis will indicate whether the current inflationary shock has created the additional fiscal space needed for the implemented discretionary fiscal policy measures. In a no policy-change setting, the government budget balance responds to shocks to price developments for the following reasons:

1. Some revenue and primary expenditure items are not necessarily proportionally linked to price developments (elasticity with regard to the price level can deviate from 1, e.g. nominally fixed budget items have an elasticity of 0).
2. The reactions of different government revenue and government expenditure items to price developments vary in their timing. Overall, government expenditure tends to react with a somewhat larger lag than government revenue.

3. The bulk of revenue and primary expenditure items automatically react to price developments in a proportional way (elasticity with regard to the price level is around 1), but they respond to different indicators (e.g. CPI vs. GDP deflator).

4. Shocks to price developments also impact real macroeconomic aggregates (employment, real wages, real GDP, etc.), which themselves have an effect on tax revenue and unemployment benefits (automatic stabilizers). Furthermore, they affect market interest rates, which in turn influence interest payments on government debt.

In this paper, we extensively discuss the latter two points, which is the most important difference between our paper and previous studies on the budgetary impact of inflation in Austria (e.g. Prammer and Reiss, 2015). In particular, we address the specific nature of the current inflationary shock. The current price dynamics are dominated by an adverse shock to import prices which pushes up consumer prices much more than the GDP deflator and which puts downward pressure on real GDP. Both these effects are detrimental to public finances.

The starting point of our analysis is the identification of the current inflationary shock to reflect the impact of the type of inflationary shock on the relative movement of various price indices and real economic aggregates (section 1). Section 2 describes the various theoretical transmission channels of inflationary shocks to Austrian public finances. Section 3 quantifies the budgetary impact of the current inflation shock in Austria. This is followed by a summary in section 4.

1 The current inflation shock and price dynamics in Austria

At the most aggregated level, the sources of inflation shocks can be split into two categories: cost-push inflation and demand-pull inflation (see also box 1). Inflationary shocks to the aggregate supply curve (cost-push shocks) push output and inflation into different directions, while shocks to the aggregate demand curve (demand-pull shocks) push them into the same direction. Therefore, inflation-increasing cost-push shocks have a negative impact on real GDP, which in turn negatively impacts the budget balance. Inflation-increasing demand-pull shocks have a positive impact on GDP and therefore also on the budget balance.

The current inflation dynamics can be decomposed into two major shocks. The first shock was triggered by a combination of a supply and a demand shock driven by supply chain disruptions, the lifting of COVID-related lockdowns and generous fiscal COVID-19 support measures. The second shock was the result of soaring energy and food prices related to the war in Ukraine. Interestingly, price developments in Austria responded to the inflation shocks in very different ways. Consumer price inflation picked up slowly in Q4 2021 and reached almost 10% in Q3 2022 (blue line in the left panel of chart 1), clearly driven mainly by the steep increase in energy prices (blue line in the right panel of chart 1). The GDP deflator (yellow line in the left panel of chart 1) increased less sharply than the consumer price index as the adverse supply shocks can be treated as largely external from an Austrian (or euro area) point of view. The disrupted supply chains and skyrocketing energy prices led to a very strong increase in construction costs, which had already started by the end of 2021 (green line in right panel of chart 1). Despite the dominant contractionary supply shocks, there were also certain demand-shock components. These were attributable to large expansionary COVID-19 measures, and also
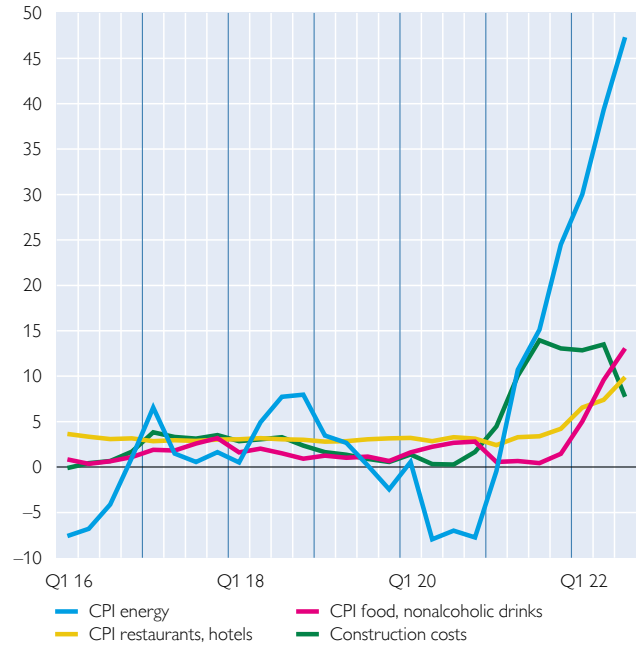
Chart 1

Change in price indices in Austria

Main price and cost indices

Change on the same quarter of the previous year in %
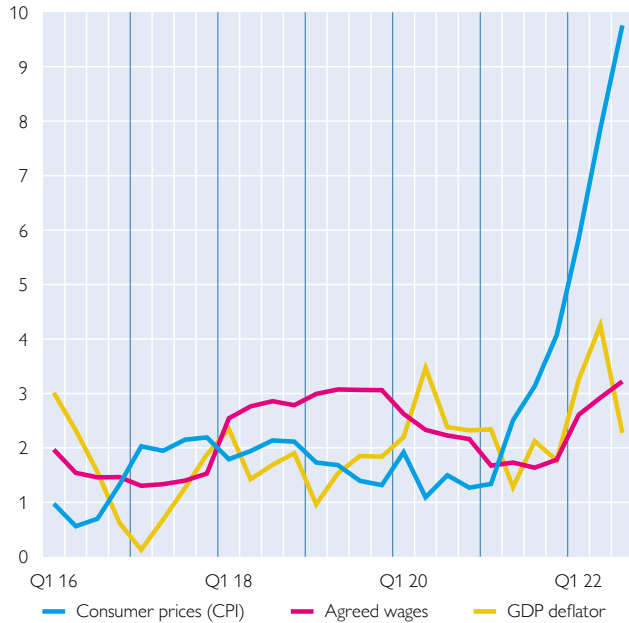
Important price subindices

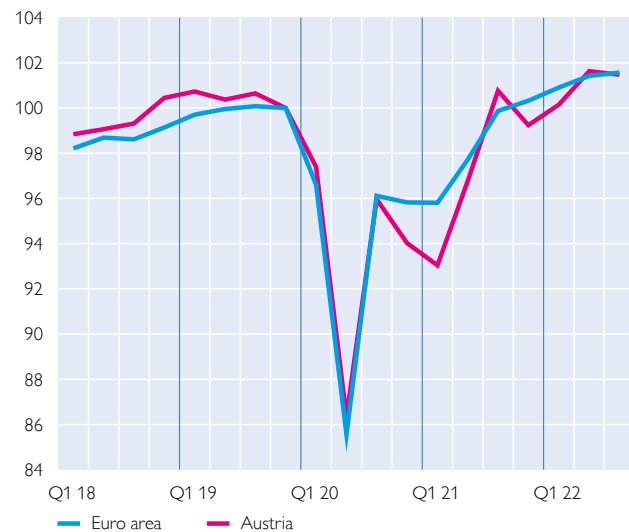*Change on the same quarter of the previous year in %*

Source: Statistics Austria, WIFO.

Chart 2

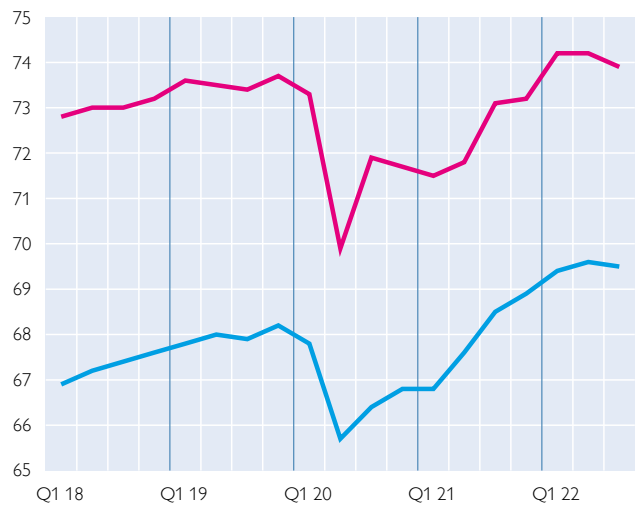## Important macroeconomic aggregates in the euro area and Austria

Real GDP per capita

Q4 2019 = 100

Employment-to-population ratio among the population aged 15 to 64

%

Source: Eurostat.

reflect the result of pent-up demand after the complete lifting of COVID-19 restrictions throughout Europe. As a result, employment across the euro area rose to unprecedented levels (right-hand panel of chart 2). Wages have not increased particularly strongly so far (red line in left panel of chart 1), mainly reflecting the lagged reaction of wages to price movements.[2]

Measures of inflation and types of inflation shocks

*The most commonly used metrics to measure inflation are the **consumer price index** (CPI) and the **GDP deflator**. While the CPI measures the price changes in the cost of living by reflecting price changes in a fixed consumption bundle for households in an economy, the GDP deflator is a broader measure of inflation that includes all goods and services produced in an economy. The CPI and the conceptually similar private consumption deflator[3] also include imported consumption goods, but they exclude goods and services produced in the economy which are exported or used as investment or in government consumption. Therefore, shocks to import prices have a much larger first-round effect on the CPI than on the GDP deflator.*

Cost-push inflation (Perry, 1987a) can be caused by domestic or international factors that trigger opposing reactions in output and price levels (pushing up the domestic aggregate supply curve). Traditionally, cost-push inflation is thought to be caused domestically, e.g. by increases in the bargaining power of workers that lead to higher nominal wages (Schwarzer, 2018). Such increases in bargaining power can be driven by organized collective movements (e.g. in the form of changing union power) or by a lack of labor supply (e.g. a decreasing working population). We refer to the domestically caused types of cost-push inflation as "wage-push inflation." Alternatively, increasing relative prices of imported intermediate goods and commodities also lead to inflation. This may be caused by an increase in international prices or a devaluation of the domestic currency. The oil price hikes in the 1970s are a well-known example of a commodity-driven worldwide increase in prices. This type of inflation is referred to as "input price shock inflation." Besides the first-round effect of input price-shock inflation on the price level, the reduction in real wages resulting from the higher price level can cause multi-round effects via nominal wage increases (built-in inflation) to stabilize real wages. These multi-round effects are often referred to as "wage-price spirals," where the perpetuation of an input price shock increases with the degree to which wages are indexed to prices. In addition to the already mentioned sources of cost-push inflation, certain price policies/regulations can also reduce aggregate supply and lead to inflationary dynamics (e.g. caps on energy prices could lead to a reduction of investment in energy production capacities, which, in turn, decreases future aggregate supply).

Demand-pull inflation (Perry, 1987b) is caused by sources that make output and price levels change in the same direction (pushing up the domestic aggregate demand curve). Policy-induced drivers of demand-pull inflation are typically expansionary fiscal policies (e.g. an increase in government consumption) or expansionary monetary policies (e.g. interest rate cuts to levels below those expected based on monetary policy rules). Other important sources of positive demand-pull shocks are increases in domestic consumer or investor sentiment as well as increases in foreign demand.

The current inflation shock in Austria can be quantified by analyzing revisions to macroeconomic projections. In this paper, we take the revision of the macroeco-

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[2] *We only show the index of collectively agreed wages because both wages per employee and wages per working hour are distorted by the statistical impact of short-time work subsidies.*

[3] *The Austrian CPI measures prices of goods and services consumed by Austrian households in Austria, while the private consumption deflator also includes those goods and services consumed by Austrians abroad. Furthermore, in contrast to the consumption deflator, the CPI does not account for imputed rents from owner-occupied housing.*

nomic projections by the Austrian Institute of Economic Research (WIFO), which the Austrian Ministry of Finance and the Austrian Fiscal Advisory Council use for their fiscal projections. Chart 3 shows a comparison of WIFO's macroeconomic projections from October 2022 (Glocker and Ederer, 2022) and October 2021 (Schiman, 2021), revealing sizable upward revisions to the levels of nominal GDP, nominal private consumption, compensation of employees and the ten-year benchmark interest rate on federal government bonds (orange lines). The bars decompose these forecast revisions into real and nominal components, respectively.[4] The forecasts of both real GDP and real consumption were significantly revised downward (red bars). These downward revisions were more than compensated for by large upward revisions to the respective deflators (blue bars). This pattern is very consistent overall with a supply shock; only the initial nonresponse of real GDP (in 2022) and the small size of the response of employment in 2022–23 point to a nonnegligible role of demand. As the current inflationary shock has affected the whole euro area, it also has substantial implications for monetary policy decisions and, hence, for market interest rates, including government bond yields. In general, higher inflation tends to raise market interest rates; this is also the case in the current crisis (bottom right panel of chart 3).

Chart 3

Revision to WIFO macroeconomic projections: Oct. 2022 vs. Oct. 2021

Nominal GDP

Difference to October 2021 projections in %
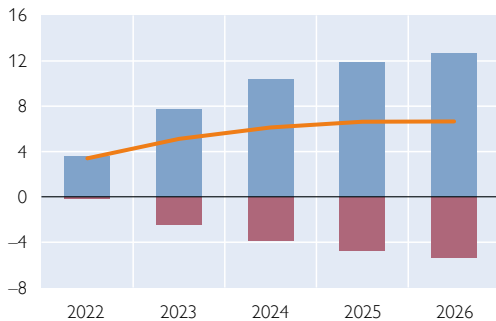
Nominal private consumption

Difference to October 2021 projections in %
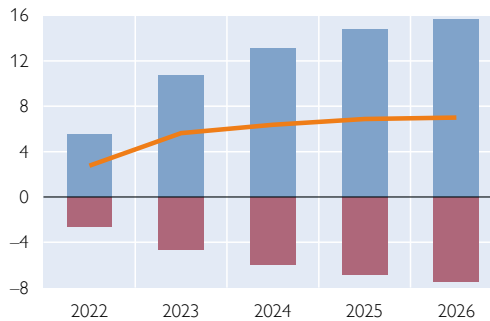
Compensation of employees

Difference to October 2021 projections in %
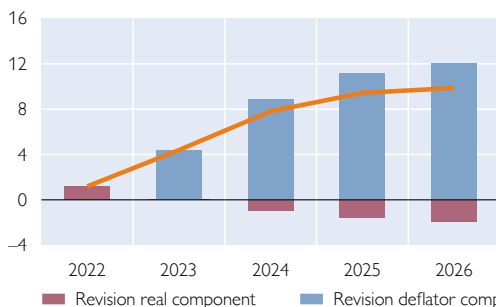
Ten-year yield of federal bonds

Difference to October 2021 projections in percentage points

■ Revision real component   ■ Revision deflator component   — Revision overall
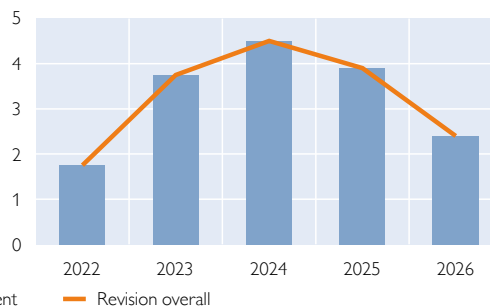
Source: WIFO, OeNB, Office of the Fiscal Advisory Council.

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[4] In the case of compensation of employees, we attribute the revisions to the growth of compensation per employee from 2023 onward to an increase due to higher inflation (i.e. as "revision deflator component"), while revisions to the number of employees as well as wages per employee in 2022 are attributed to the "real component."

2 The budgetary impact of inflation in Austria – theoretical considerations

Most revenue and expenditure items respond to inflation even in the absence of explicit discretionary policy action as – broadly speaking – most of these items are linked to nominal macroeconomic aggregates (listed in tables 1 and 2), which in fiscal forecasting are often referred to as "macroeconomic bases." Since price level changes influence these nominal macroeconomic bases, they indirectly also affect government revenue and expenditure reactions.

On the revenue side, most taxes are levied as percentages of certain tax bases which are steered by the dynamics of nominal macroeconomic aggregates (either as fixed percentages or at rates varying with the tax base; table 2). Most of these tax bases are income variables (i.e. wages, corporate profits, pensions etc.) or parts of consumption.

On the expenditure side, most social benefits are automatically adjusted to past inflation (table 3). The growth in expenditure on the compensation of government employees is determined by public wage agreements (table 1), which partly depends on past CPI inflation. Significant parts of spending on other current transfers, subsidies and other transfers are also linked to inflation. They are either payments for public services provided by nongovernment entities (e.g. nonprofit hospitals, nonprofit education providers, public transport providers classified outside govern-

Table 1

Macroeconomic bases for government revenue and expenditure

	ESA code	Revenue in 2021		Macroeconomic bases in fiscal projections model of the Office of the Fiscal Advisory Council
		EUR billion	% of GDP	
Government revenue				
Taxes on production and imports	D21+D29	56.5	13.9	See table 2
Current taxes on income, wealth, etc.	D51+D59	56.6	13.9	See table 2
Net social contributions	D61	64.2	15.8	See table 2
"Sales"	P11+P12+P131	17.9	4.4	Trend + GDP deflator (partly lagged)
Other revenue	D39+D4+D7+D9	8.0	2.0	Trend + GDP deflator
Government expenditure				
Social benefits in cash	D62	79.1	19.5	Trend[1] + price indices from table 3
Expenditure on personnel[2]	D1+D29	46.5	11.4	Trend + public wage agreements
Intermediate consumption	P2	30.3	7.5	Trend + GDP deflator (partly lagged)
Social transfers in kind purchased from market producers	D632	18.3	4.5	Trend + consumption deflator (partly lagged)
Investment + other net acquisition of nonfinancial assets	P5+NP	14.2	3.5	Trend + GDP deflator (partly lagged)
Interest spending	D41	4.5	1.1	change in debt, structure of maturing debt, interest rates
Subsidies	D3	18.8	4.6	Trend + partly GDP deflator (R&D, transport, labour market, …)
Miscellaneous current transfers	D75	8.4	2.1	Trend + partly GDP deflator (health, education, …)
National contribution to the EU budget	D76	3.5	0.9	GNI, ficitional "harmonized VAT base"
Other transfers	D9+D71+D74+ D5+(D4-D41)	3.7	0.9	Trend

Source: Statistics Austria, OeNB, Office of the Fiscal Advisory Council.

[1] *Except for unemployment benefits, which depend on number of unemployed and lagged average wages.*

[2] *Government expenditure on other taxes on production (D29) largely consists of payroll taxes and is therefore combined with compensation of employees (D1).*

Table 2

Indexation and macro bases of taxes and social security contributions[1]

	ESA code	Revenue in 2021		Indexation	Macro base in projections
		EUR billion	% of GDP		
Progressive taxes on income					
Income tax on wages and pensions	D51	31.1	7.7	from 2023[2]	Employees, avg. wages; pensioners, avg. pensions
Assessed income tax	D51	4.9	1.2	from 2023[2]	Gross operating surplus
Income-related taxes with floors and ceilings for tax base					
Social security contributions	D61	62.6	15.6	yes[3]	Total wages
Contribution for promotion of residential buildings	D51	1.2	0.3	yes[3]	Total wages
Fixed-amount unit taxes on goods					
Taxes on beer and alcohol	D21	0.3	0.1	no	Real consumption
Energy tax	D21	0.9	0.2	no	Real consumption
Mineral oil tax	D21	4.2	1.0	no	Real consumption
Tobacco tax	D21	2.1	0.5	no	Real consumption
Property tax A+B	D29	0.8	0.2	no	Trend
Motor vehicle tax	D59/D29	2.7	0.7	no	Real consumption
Public service broadcasting fee (incl. taxes collected with it)	D59/D29	1.0	0.2	no	Trend
Proportional taxes on income					
Corporate income tax	D51	10.2	2.5	n/a	Gross operating surplus
Capital income tax	D51	4.2	1.0	n/a	Gross operating surplus
Employer contributions to the family equalization fund (FLAF)	D29	6.0	1.5	n/a	Total wages
Municipal payroll tax	D29	3.5	0.9	n/a	Total wages
Ad valorem taxes on goods and services					
Value added tax	D21	31.0	7.7	n/a	Nominal consumption
Land transfer tax	D21	1.7	0.4	n/a	Trend
Insurance tax	D21	1.3	0.3	n/a	Trend
Duty on vehicles based on fuel consumption	D21	0.4	0.1	n/a	Nominal consumption
Taxes on gambling	D21	0.7	0.2	n/a	Nominal consumption

Source: Statistics Austria, OeNB, Office of the Fiscal Advisory Council.

[1] This table excludes taxes payable to chambers, to the deposit insurance fund or to EU institutions.

[2] Indexation is based on average CPI inflation from July t-2 to June t-1; two-thirds are automatically, one-third is discretionary.

[3] Indexation is based on the average growth in the base for pension contributions from year T-3 to year T-2 ("Aufwertungszahl").

Note: n/a = not applicable

ment) or consist in public co-financing of a certain share of private expenditure on wages and intermediate inputs (e.g. active labor market policies, premium for R&D, compensation of health providers for input VAT).

A significant share of other revenue and expenditure items are essentially sales or purchases of goods and services, so they also reflect price changes ("sales" on the revenue side; intermediate consumption, social transfers in kind and investment on the expenditure side; table 1).

Despite this responsiveness of both government revenue and expenditure, the current inflationary shock is not neutral on public finances. As mentioned in the introduction, this is due to the partial lack of indexation mechanisms (column 4 in table 2 and column 3 in table 3; section 2.1), due to time lags (section 2.2), due to dependencies on differently evolving deflators (section 2.3) and due to the impact of inflationary shocks on the real economy and interest rates (section 2.4).

Table 3

Indexation of social benefits in cash[1]

	Expenditure in 2021		Indexation[2]
	EUR billion	% of GDP	
Pensions[3]			
Old-age pensions	48.2	12.0	yes
Survivor's pensions	6.5	1.6	yes
Disability pensions	3.7	0.9	yes
Federal[4] income replacement benefits (except pensions)			
Unemployment benefits for short-term unemployed	1.9	0.5	no
Unemployment benefits for long-term unemployed	2.2	0.5	no
Continuing education allowance ("Weiterbildungsgeld")	0.2	0.0	no
Maternity allowance ("Wochengeld")	0.6	0.1	no
Sickness benefits	0.9	0.2	from 2023
Rehabilitation / short-term invalidity benefits	0.4	0.1	from 2023
Federal fixed-amount social benefits			
Long-term care benefits	2.7	0.7	yes
Cash family benefits from family burden equalization fund ("Familienbeihilfe")	3.6	0.9	from 2023
Cash family benefits labeled as "tax credit for children" ("Kinderabsetzbetrag")	1.3	0.3	from 2023
Childcare benefits[5] ("Kinderbetreuungsgeld")	1.2	0.3	from 2023
Assistance to pupils and students	0.3	0.1	from 2023
Payable tax credit for one-income families	0.3	0.1	from 2023[6]
Important benefits on state level			
Basic social assistance	1.1	0.3	yes[7]

Source: Statistics Austria, OeNB, Office of the Fiscal Advisory Council.

[1] Excluding temporary social benefits paid out because of the COVID-19 crisis (e.g. income replacement benefits for self-employed).
[2] Indexation to average CPI inflation from August t-2 to July t-1 (except for payable tax credit for one-income families).
[3] Sum of pensions paid by pension insurance, accident insurance and pensions for civil servants.
[4] Federal government plus social security funds.
[5] Most parents opt for the fixed-amount childcare benefit, and the childcare benefit specified as income replacement has a nominally fixed ceiling.
[6] From a legal point of view, the tax credit for one-income families is part of the tax system, and therefore indexation is the same as for other major income tax parameters (table 1).
[7] Due indexation to the level of the federal minimum pension ("Ausgleichszulage").

2.1 The role of (non-)indexation of nominally fixed fiscal variables

In Austria, social benefit payments are, in general, either determined by recipients' past incomes or fixed sums per person. The amounts paid under the most important social security benefits in Austria – pensions, sickness, rehabilitation, unemployment and maternity benefits – are determined by the past incomes earned by recipients (table 3). This means that even without inflation indexation, the payments of these wage replacement benefits to new recipients will grow per capita (albeit with a lag) as long as the relevant previously earned wages or self-employment incomes grow. The longer individuals receive such benefits, the more relevant inflation indexation becomes to ensure that the benefits do not erode in real terms over time. Reflecting this fact, long-term payments such as pension payments and basic social assistance are automatically linked to inflation. If benefit duration is short (unemployment benefits for short-term unemployed or maternity benefits), inflation indexation will have little effect on the amounts paid to recipients and on overall government expenditure.[5]

[5] This is also why the official cost estimates for the recently introduced inflation indexation of sickness and rehabilitation benefits are very low compared to total government expenditure on these two items.

The largest social benefits besides the income replacement benefits listed above are long-term care benefits and federal family benefits (table 3). They are paid out as fixed amounts per person. Until 2019, none of these benefits was automatically adjusted to inflation. In the absence of discretionary policy action, the real value of these transfers continuously decreased. This was particularly visible in long-term care benefits in the 2000s and early 2010s (Prammer and Reiss, 2015). Since 2020, long-term care benefits have been automatically adjusted to past inflation. From 2023 onward, family benefits are also inflation-indexed (table 3).

Taxes accounting for about one-third of tax revenue, namely taxes on corporate and capital income, payroll taxes and ad-valorem taxes on goods and services, are largely levied as fixed percentages. Under the assumption of no policy change and broadly balanced growth in income and consumption variables (i.e. macroeconomic bases), these taxes can be expected to increase in line with overall price growth over the medium run. Therefore, legal indexation mechanisms are "not applicable" in table 2.[6]

Most personal income taxes and social security contributions are not proportional to their respective tax bases, but the parameters inducing this nonproportionality (i.e. tax brackets and tax credits) are indexed to past inflation or past income growth: For social security contributions, the assessment base is subject to both a floor (below which very little contributions have to be paid) and a ceiling (above which no additional contributions are due). Both these parameters are automatically adjusted in line with the growth in the average assessment base for pension contributions (closely related to growth in average wages) from year T-2. Personal income tax on wages, pensions and self-employment income is progressive, i.e. marginal tax rates increase with income. For unchanged tax credits and tax brackets, an increase in average incomes by about 1% leads to an increase in revenue from these taxes by almost 2%. This would mean that positive inflation has substantial effects on implicit tax rates in the absence of changes to tax parameters. However, from 2023 onward, income tax brackets and the most important tax credits are quasi-indexed to past CPI inflation (table 2).

Furthermore, the rates for taxes on specific goods are set in nominal terms, either as fixed amount per quantity purchased (e.g. liters of fuel) or as fixed amount per quantity owned (e.g. engine capacity of cars). These tax rates are not subject to inflation indexation. Therefore, their real value erodes over time (without discretionary policy action). In 2021, these nonindexed taxes summed up to around 3% of GDP (table 2).

2.2 The role of time lags in response to inflation

The indexation of social benefits and income tax parameters imply that these fiscal items (partly) react to inflationary shocks with a time lag. The same is true for public wages because wage agreements take past inflation as an important reference point. Overall, ex post indexation to past CPI rates is more prominent on the expenditure side, while a significant share of revenue can be expected to react almost simultaneously to inflationary shocks (especially revenue from VAT). Therefore, government expenditure tends to react more slowly to price increases

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[6] *Only some relatively minor parameters concerning these taxes are fixed in nominal terms (e.g. minimum corporate tax, parameters concerning property transaction taxes on inheritances and gifts).*

than government revenue. This discrepancy is smaller in the current environment determined by an import price-driven cost-push shock as the reaction of revenue also tends to be slower than during domestic wage-push shocks or domestic demand shocks. Inflationary shocks driven by import price hikes cause average wages to respond to higher consumer prices with a time lag, while in case of a wage-push shock, higher average wages are the source of the inflationary shock. In case of demand shocks, average wages will go up faster than in the case of import price-driven cost-push shocks due to an increase in average hours worked per employee.

2.3 Dependence on different deflators

Due to different nominal macroeconomic bases and reference data series for index-ation mechanisms, the relevant deflators for the fiscal variables differ from each other. Overall, the GDP deflator is more relevant for revenue categories, while CPI inflation is more relevant for the expenditure side: A large part of revenues are taxes and social security contributions based on wage and profit income generated in the domestic economy, and the GDP deflator can be thought of as the price index best reflecting these aggregates (even though agreed wage increases tend to be related to past CPI rates, they eventually push up the GDP deflator). On the expenditure side, consumer prices are more relevant as most social benefits in cash are explicitly indexed to CPI inflation. Furthermore, CPI inflation is an important reference point for increases in public wages, and, finally, the government is a consumer itself. These facts imply that an inflationary shock where the GDP deflator increases far less than the CPI (charts 1 and 3) tends to be detrimental to public finances.

Concerning the relevance of consumer prices for government spending on goods and services, one must note that the "consumption bundle" of the government is very different from that of households. For example, the share of food, drinks and restaurant services in government consumption is very low. High food inflation raises the reference index for increases in public wages and social benefits, but it has no significant effect on nonwage government consumption. At the same time, more than one-tenth of public intermediate consumption was spent on energy in 2018 (according to 2018 input output tables), which led to a share of energy in overall government spending on goods and services similar to that of households. Furthermore, as a large share of public investment is in construction, the government is heavily impacted by the current strong rise in construction prices (like house-holds).

2.4 Direct impact via (real) automatic stabilizers and changes in interest rates

Tables 1 and 2 show that the bulk of revenue and expenditure items are somehow impacted by macroeconomic developments. However, most expenditure items only react to price deflators, the most important exception being unemployment benefits, which tend to decrease with higher economic activity.[7] In contrast to that, the bulk of tax revenue is positively correlated to both price deflators and real

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[7] *In case of country-specific shocks, contributions to the EU budget would also increase with real economic activity, but this effect is much smaller in absolute value than the expenditure-decreasing effect of higher real activity on unemployment benefits.*

activity. Therefore, it is widely acknowledged that – ceteris paribus – higher real economic activity tends to improve budget balances (only the magnitude of this effect is subject to debate).

This implies that inflationary shocks resulting in higher real GDP and employment (i.e. positive demand-pull shocks) are beneficial for public finances, while inflationary shocks resulting in lower real GDP and employment (i.e. adverse cost-push shocks) are unfavorable. If income tax brackets and social benefits are mostly indexed to inflation (as is the case in Austria from 2023 onward), these effects should typically be larger (in absolute value) than the other fiscal effects of inflation at least in the medium and long run. This is also illustrated in the next section.

Furthermore, inflationary shocks also tend to affect interest rates and, consequently, interest spending as well as (the relatively smaller) revenue from interest and taxes on interest income. As Austrian government debt has predominantly relatively long average maturity and carries mostly fixed coupon, changes in interest rates translate slowly into changes in interest payments; this also contributes to government expenditure responding to inflation more slowly than government revenue.
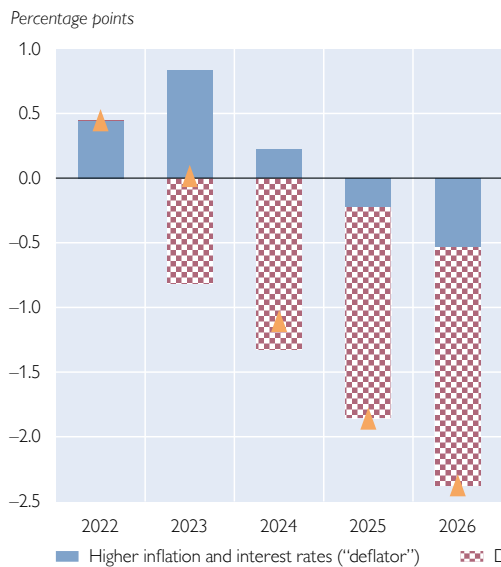
3 Simulation of the budgetary impact of the current inflation shock

The current high inflation episode can be described in short as an environment of high aggregate demand hit by especially large input price shocks accompanied by wage-push shocks (section 1). To illustrate the implications of the current inflationary shock, we quantify the impact of the revisions to WIFO's macroeconomic projections (chart 3) using the projections model developed by the Office of the

Chart 4

Effect of revisions to macroeconomic projections on public finances

Effect on budget balance to GDP (including denominator effects)

Percentage points

Effect on public debt to GDP (including denominator effects)

Percentage points

Legend: ■ Higher inflation and interest rates ("deflator")   ▨ Different real GDP and employment ("real")   ▲ Overall

Source: Office of the Fiscal Advisory Council, OeNB, WIFO.

Austrian Fiscal Advisory Council (Büro des Fiskalrates, 2014).[8] This model uses a granular decomposition of government revenue and expenditure and links their evolution to the macroeconomic aggregates and price indices listed in tables 1 and 2. The macroeconomic projections by WIFO are treated as exogenous inputs such that there is no macro feedback from changes to fiscal variables.

We show that the overall revisions to the macroeconomic projections contributed positively to the budget balance in 2022. Further on, this effect continuously deteriorates and turns negative from 2024 onward (orange triangles in the left panel of chart 4). This development is largely due to the highly negative impact of the inflation shock on real GDP and employment (shaded red bars). Nevertheless, in 2025, the contribution of higher inflation and higher interest rates (blue bars) also turns negative. Due to the GDP denominator effect, the short-term impact of the inflation shock on the debt ratio is negative (i.e. favorable from a fiscal viewpoint), but from 2026 on, continuously increasing accumulated budget deficits lead to a deterioration in the debt ratio (right panel of chart 4).

Chart 5 decomposes the results shown in chart 4 further by highlighting the importance of denominator effects as both the budget balance and public debt are expressed as ratios to nominal GDP. Furthermore, chart 5 breaks down the impact on the budget balance by contributions from expenditure and revenue, and it shows the impact of changes in interest payments on public debt.

The left panel of chart 5 shows that in absolute terms, the effect of lower real GDP on revenue (red shaded bars) is much smaller than the effect of higher inflation on revenue (light blue bars) and expenditure (dark blue bars). However, the latter two effects broadly cancel each other out, leading to a comparatively small effect of higher inflation and interest rates on the budget balance (as shown in the blue bars in the left panel of chart 4). Therefore, the effect of lower real GDP on revenue (i.e. automatic stabilizers; red shaded bars in chart 5) clearly dominates the overall revision to the budget balance (orange triangles in chart 5). Government expenditure reacts with a somewhat larger lag to higher prices than government revenue, which contributes to the positive short-term effect of higher inflation and interest rates on the budget balance.

As regards public debt (right panel of chart 5), denominator effects are the main drivers of the results in the first years, and the debt ratio-reducing effect of the higher GDP deflator (light blue bars) is much larger in absolute terms than the debt ratio-increasing effect of lower real GDP on the denominator (shaded red bars). However, in the subsequent years, the debt-increasing effects of higher primary deficits due to lower real GDP (shaded yellow bars) and of higher interest payments (gray bars) become more important and, ultimately, lead to increasing debt ratios from 2026 onward. Due to the long average maturity of public debt, higher interest rates take some time to feed through to interest payments, but at the same time, this makes the effect on interest payments very persistent. So, if both market interest rates and GDP deflator growth were to jump back to pre-inflation shock levels in 2027, the debt ratio-reducing effect of the higher level of the GDP deflator would remain unchanged compared to 2026, while the debt-increasing contribution of
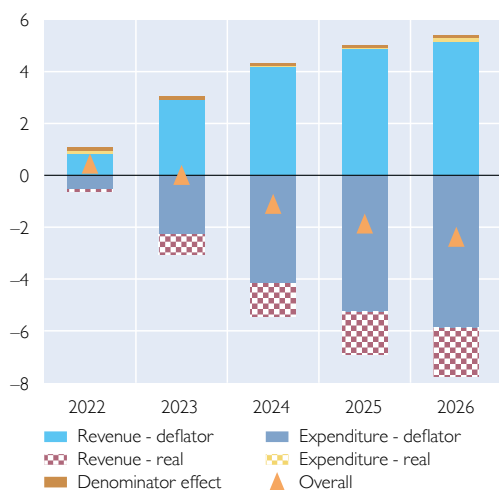
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[8] *As mentioned in section 1, the WIFO projections from September/October are also used in the regular budgetary projections by the Austrian Fiscal Advisory Council.*

Chart 5

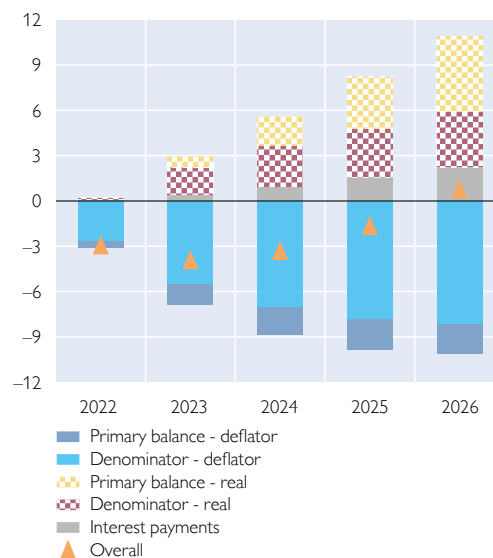**Further decomposition of inflation effects on public finances**

Effect on budget balance to GDP
(including denominator effects)

Percentage points

Effect on public debt to GDP
(including denominator effects)

Percentage points

Legend (left chart):
- Revenue - deflator
- Revenue - real
- Denominator effect
- Expenditure - deflator
- Expenditure - real
- Overall

Legend (right chart):
- Primary balance - deflator
- Denominator - deflator
- Primary balance - real
- Denominator - real
- Interest payments
- Overall

Source: Office of the Fiscal Advisory Council, OeNB, WIFO.

higher cumulated interest payments would continue to grow until the debt issued at high interest rates matures.

The detrimental effects of the current inflation shock on public finances are substantially influenced by the recently introduced indexation of income tax brackets and family benefits. Up until 2022, positive inflation improved the contribution of fixed-amount tax brackets and social transfers to the budget balance (first and second columns in table 4). This factor contributed significantly to the consolidation episode from 2010 to 2015. However, from 2023 onward, positive inflation will reduce this contribution, as nominally fixed parameters of taxes on goods (like the mineral oil tax or the motor vehicle tax) are not indexed to inflation (section 2.1). The revisions to inflation projections increase the cumulated reference inflation relevant for tax and benefits indexation by about 12 percentage points until 2026. Given that the introduction of indexation has changed the effects of 2% inflation on the budget balance by about 0.2 percentage points (table 4), this im-

Table 4

Effects of nonindexation of taxes / transfers on budget balance with inflation at 2%

	Until 2019	2020 to 2022	From 2023
	% of GDP		
Progressive income taxes	0.15	0.15	0.00
Fixed-amount unit taxes on goods	−0.06	−0.06	−0.06
Fixed-amount social benefits	0.05	0.03	0.00
Sum	0.14	0.13	−0.06

Source: OeNB, Office of the Fiscal Advisory Council.

plies that the effect of inflation revisions on the 2026 budget balance would have been higher by about 1.2 percentage points under a no policy-change scenario.[9]

4 Conclusion

The recent increase in inflation has contributed to strong growth in government revenue. At the same time, it has substantially increased government expenditure and reduced real economic growth. To evaluate the budgetary effect of the inflationary shock, its composition has to be closely examined. The current inflationary shock mainly consists in a strong increase in international energy prices. Most importantly, this type of shock has a negative impact on real GDP, which in turn has a clearly negative effect on public finances. Furthermore, the current shock raises the CPI more than the GDP deflator. Since government expenditure in Austria is mainly influenced by the CPI, while revenue is more closely related to the GDP deflator, expenditure has increased more strongly than revenue in the current high-inflation environment. This implies that overall, the inflation shock has had a negative impact on the government budget. However, given that expenditure increases with a greater lag than revenue, the short-term impact of the inflationary shock on the budget balance is positive. That said, this positive budgetary short-term effect is far smaller than the size of the discretionary fiscal policy measures implemented to alleviate the impact of the inflationary shock on real household incomes and firms.

As regards the public debt ratio, the inflation shock has a relatively favorable effect in the short run. This is due to a large denominator effect caused by a higher GDP deflator. However, on account of the continuously increasing adverse effects on budget deficits, the current shock raises the debt ratio from 2026 onward. Our analysis further shows that the recently introduced inflation indexation of income tax brackets and family benefits has a large impact on public finance dynamics; before this policy change, revenue reacted more strongly to changes in inflation in the medium run, while the response of expenditure was slightly weaker.

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[9] *However, it would have been politically hard to justify not making any adjustment to income taxes and family benefits when inflation is that high.*