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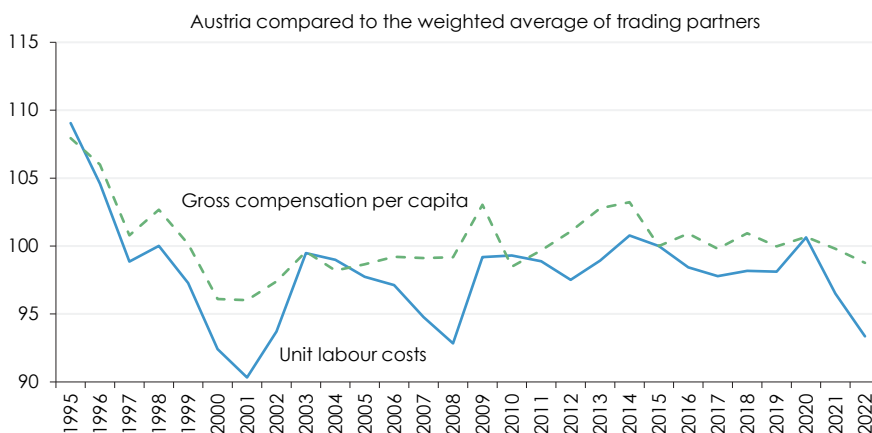
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- The article examines the development of wage-related competitiveness on the basis of unit labour cost development in Austria relative to the main trading partners.
- Relative unit labour cost development is a composite measure of changes in labour costs, productivity, and the exchange rate.
- Austria's nominal effective exchange rate decreased by 0.7 percent in 2022. This corresponds to a slight depreciation.
- Unit labour costs in Austrian manufacturing increased by 2.2 percent in 2022. Relative unit labour costs thus improved both compared to the weighted average of all trading partners (–3.3 percentage points) and compared to EU trading partners (–1.7 percentage points).
- Due to the energy crisis, the results for 2022 should be interpreted with caution.

Development of relative labour costs and unit labour costs in manufacturing

In €, 2015 = 100



"In 2022, Austria's unit labour costs again improved significantly."

After a longer phase of stable unit labour costs, Austria's unit labour cost position vis-à-vis its trading partners has been improving since 2021 (Q: Statistics Austria, Eurostat, AMECO, national statistical offices, WIFO calculations. Trading partners: EU trading partners (excluding Malta), Norway, the UK, the USA, Canada and Japan).

Improvement in Relative Unit Labour Costs in 2022

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Improvement in Relative Unit Labour Costs in 2022

In 2022, unit labour costs in Austrian manufacturing increased by 2.2 percent year-on-year. This implies a significant improvement in relative unit labour costs, both compared with the weighted average of all trading partners (–3.3 percentage points) and with EU trading partners (–1.7 percentage points). Relative unit labour costs also improved compared with Germany, the most important trading partner (–1.4 percentage points). This development vis-à-vis our trading partners is being driven by a weaker increase in labour costs coupled with a stronger rise in productivity. The favourable exchange rate development had a supporting effect. When interpreting the data, long-term comparisons still need to take into account country-specific differences in the COVID-19 aid measures. The data for 2022 may also have been distorted by the different international approaches to cushioning high inflation.

JEL-Codes: F16, F31, J3, L6 • **Keywords:** Unit labour costs, price competitiveness, manufacturing

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1. Relative unit labour costs depict the development of Austria's price competitiveness in the manufacturing sector

The interaction of production costs, productivity and exchange rates plays an important role in the international competitiveness of national economies. The development of the price competitiveness of Austrian goods can be mapped with the help of the change in relative unit labour costs over time. Relative unit labour costs are an index in which changes in labour costs, productivity and the exchange rate are combined in one indicator and compared with the unit labour costs (i.e., labour costs per unit produced) of the most important trading partners adjusted for exchange rate changes.

Unit labour costs, however, are only a partial measure of the international competitiveness of a sector or even of an entire economy, as they only depict the price-related or, more precisely, the wage-related dimension of competitiveness. As some econometric studies show, the change in relative unit labour costs contributes significantly to explaining trade flows and shifts in market shares between trading partners in the medium term (e.g., Carlin et al., 2001; Köhler-

Töglhofer et al., 2017). Other studies though emphasise the role of other factors, such as technology and organisational structures, in the development of exports and market shares, while attributing only limited explanatory power to changes in unit labour costs (Dosi et al., 2015).

This article is the annual update of the analysis of unit labour cost development. It examines the period from 1995 to 2021 and, thus, covers both the effects of the COVID-19 pandemic and the effects of the energy crisis on the development of Austria's relative unit labour costs in relation to its main trading partners. However, the results for the crisis years 2020, 2021 and 2022 must be interpreted with caution, both in comparison over time and in comparison with the main partner countries. This is due to country-specific differences in the design, implementation and statistical accounting of the COVID-19 measures and the support measures in the context of the energy crisis.

The choice of countries included in the comparison is limited by the availability of longer

time series on unit labour costs or their individual components. The analysis therefore concentrates on the EU member countries (with the exception of Malta) as well as Norway, the USA, the UK, Japan and Canada. These 30 countries cover more than two-thirds of Austrian imports and exports.

With the national accounts for the year 2022, which were published in September 2023, the data for the years 2018 to 2021 were also revised. In addition, the

calculation of the weights for the relative unit labour costs was updated to reflect the trade linkages as accurately and currently as possible. The revision and the adjustment of the weighting calculation resulted in a correction of individual values, but the trend in unit labour cost development remained unchanged. Compared to the analysis of the previous year (Bitschi & Meyer, 2022), the revised data show a significantly more favourable development of relative unit labour costs in Austrian manufacturing.

2. The nominal effective exchange rate decreased by 0.7 percent in 2022

The starting point for the consideration of price competitiveness and thus the relative unit labour cost position is the nominal effective exchange rate. This compares the value of the national currency with a basket of currencies that reflects the importance of the individual trading partners by means of a weighting scheme¹. By deflating the nominal effective exchange rate with unit labour

costs, the unit labour cost position of domestic production of tangible goods can be determined. The unit labour cost position thus reflects the real external value of the national currency in international competition and thus corresponds to a real effective exchange rate of this currency (see box "Calculation method and data basis for the unit labour cost comparison").

Figure 1: Development of the nominal effective exchange rate index for industrial goods



Source: WIFO calculations. Weighted average of the group of countries according to the calculation of unit labour costs.

In 2022, Austria observed a slight depreciation of the nominal effective exchange rate for industrial goods (−0.7 percent)². This was the result of a combination of appreciation and depreciation of the euro against the national currencies of the different trading partners (Figure 1). For example, the euro appreciated against the Hungarian forint (+9.06 percent), the Japanese yen (+6.27 percent), the Swedish krona

(+4.76 percent), the Polish zloty (+2.64 percent), the Romanian lei (+0.22 percent) and the Danish krone (+0.03 percent), which made Austrian exports to these countries more expensive. These upward developments were contrasted by devaluation movements against other currencies. The euro lost value relative to the Norwegian krone (−0.61 percent), the British pound (−0.86 percent), the Canadian dollar

¹ Since in the weighting scheme of the currency basket used slightly more than 70% is accounted for by euro countries, exchange rate changes in the calculation of the nominal effective exchange rate play only a minor role for the Austrian export economy.

² A decline in the nominal effective exchange rate corresponds to a devaluation of the reference currency (euro or, before 1999, schilling), an increase to an appreciation.

Despite a slight depreciation in 2022, the recent developments of the nominal effective exchange rate shows a stable picture.

(-7.63 percent), the Swiss franc (-7.05 percent) and the dollar (-10.95 percent). Particularly due to the strong depreciation against the dollar and the Swiss franc, there was a slight overall decline in the nominal effective exchange rate for Austrian industrial goods despite the strong appreciation against the Hungarian forint and the Japanese yen.

Over the long term, the exchange rate index has remained largely stable since 2004, exhibiting only minor fluctuations³. Since 2015, there has been a slight upward trend (2022 +1.9 percent compared to 2015), although this slowed somewhat in 2019 and 2022.

Calculation method and data basis for the unit labour cost comparison

The unit labour costs in national currency (*ULC*) of an industry, a sector or the total economy are defined by the ratio of the nominal wage total (*NWT*) to the real gross value added (*GVA*):

$$ULC = \frac{NWT}{GVA}$$

Dividing both payroll and gross value added by a measure of labour input yields the two components of unit labour costs: labour costs per unit of labour and labour productivity.

A change in the share of the self-employed in the labour force can be taken into account by presenting unit labour costs as a quotient of labour costs per employed worker (*EM*) and gross value added measured in terms of employed persons (*PE*):

$$ULC = \frac{\frac{NWT}{EM}}{\frac{GVA}{PE}}$$

WIFO calculates unit labour costs using these formulas and with data determined according to the national accounts survey concept. For the determination of unit labour costs in Austrian manufacturing, the number of employment relationships or jobs is used instead of the person concept (employees and workers).

For international comparisons, unit labour costs must be expressed in a common currency because exchange rate shifts can change a country's cost position just as much as unit labour cost developments. The relative unit labour cost position of a country is thus the quotient of the unit labour costs of both countries, measured in a common currency. For a comparison with several countries, a weighting scheme must be used since the individual markets usually have different importance in foreign trade. Irrespective of the methodological approach, such a weighting scheme is based on data from foreign trade statistics and thus maps the foreign trade interdependence of an economy.

WIFO relies on a harmonised method, which is also used by central banks of the euro area to measure international competitiveness. The weighting scheme consists of single (bilateral) import weights and double (multilateral) export weights for industrial goods (SITC 5 to 8; for details on the method see Turner & Dack, 1993). The double export weighting takes into account not only competition with trading partners in the respective domestic markets, but also competition in all other export markets. Since 2022, the double export weights have been calculated and applied separately for each year based on the OECD's "Trade in Value Added" information. For the years 2021 and 2022, the average of the years 2018-2020 was updated due to missing data. The change in the weighting scheme to annual, variable weights makes it possible to take into account shifts in market share as well as changes in competition with third countries in foreign markets. The recalculation of the weights thus ensures the most accurate and up-to-date representation for country-specific trade links.

The international data on gross compensation, productivity and unit labour costs of manufacturing and the total economy are mainly based on Eurostat data. Only when the Eurostat database did not contain up-to-date values, figures from the AMECO database and national statistics of the respective countries were used (this concerns the USA, Canada, Japan and the UK).

To the country selection

The aggregate "EU trading partners" comprises the EU 27 without Austria and Malta, the aggregate "All trading partners" the "EU trading partners" and additionally the UK, Norway, the USA, Canada and Japan.

3. Despite the energy crisis, Austria still experiences a dynamic development of labour costs and productivity

The development of labour costs in manufacturing is assessed on the basis of gross compensation (remuneration) per employee in national currency (Table 1). This figure from the national accounts records the total wages and salaries including employers' social security contributions per capita. As a result of the COVID-19 aid measures and support measures in the context of the

energy crisis, the financing of compensation of employees in 2020, 2021 and 2022 shifted in part from companies to the public sector. As these circumstances impairs the national accounts, the data on labour costs in these periods do not always provide information on the actual expenditure of companies and should therefore be interpreted with caution as a determinant of price

³ The range of variation would be greater if a larger number of non-euro countries could be included in

the analysis than is possible here due to data availability.

competitiveness. This also applies – as in previous years – in a similar way to the comparison countries. In addition, different support measures were taken in the reference countries, which makes it difficult to compare labour costs both between countries and within individual countries over time.

In 2022, in nominal terms, the gross compensation per capita in Austrian manufacturing increased by 5.1 percent compared to the previous year. This means that labour costs in Austria increased more strongly than in 2021 (+3.9 percent). In the most important trading partners, labour costs per capita increased somewhat more strongly than in Austria. On a weighted average of all trading partners, the increase was 5.4 percent (EU trading partners +5.7 percent). In Germany, on the other hand, labour costs increased 2 percentage points less than in Austria.

Over the longer term, according to the current data, labour costs per capita in Austria developed somewhat less dynamically than in the weighted average of trading partners. Over the past ten years, they rose by 2.5 percent p.a. in Austria, by 2.9 percent p.a. in the weighted average of all trading partners and by 3.0 percent p.a. in the weighted average of EU trading partners. Thus, the long-term increase in labour costs per capita in Austria is slightly below the weighted average increase among the trading partners. However, these comparisons based on figures in national currency have not yet taken exchange rate fluctuations into account.

As the analysis in a common currency, i.e., after taking exchange rate fluctuations into account, shows, labour costs in Austria rose relative to the comparison countries, especially in the crisis year 2009 and then again between 2011 and 2014 (Figure 2). In 2015, relative labour costs in Austria declined again and fluctuated only slightly in the following years, although at the current margin a slight decline can be observed again. After taking exchange rate changes into account, labour costs per capita in Austria in 2022 were at a similar level relative to trading partners as in 2010. The comparison with EU trading partners also shows a similar picture. Here, relative labour costs in 2022 were at a similar level to the previous year and the mid-2000s.

The weighted average of all trading partners results from partly very different labour cost trends in the individual countries or country groups. Due to the strong devaluation of the euro against the dollar and the Canadian dollar, labour costs in euros in the USA (+16.2 percent) and Canada (+14.2 percent) increased significantly in relation to Austria and the euro countries. Due to these cost and exchange rate dynamics, per capita labour costs in manufacturing in Austria

increased 1 percentage point less than the weighted average of all trading partners.

As the most important trading partner, Germany plays a special role in the consideration of labour costs. In the 2000s and until the financial market and economic crisis in 2009, labour costs per capita in German manufacturing increased very moderately. During this period, labour costs in Austria increased significantly more than in Germany (Figure 2). This pattern changed after the outbreak of the crisis. Until 2017, there was no clear shift in the cost ratio between the two countries. However, the data for the years 2018 to 2022 show a stronger increase in gross compensation per capita in Austria than in Germany, with weaker labour cost dynamics at the same time.

While labour costs per capita in Germany and Austria increased by about the same extent as the EU average in the 2010s, other euro countries recorded lower increases. With the exception of Ireland, this is especially true for those countries that suffered significantly from the financial market and economic crisis and the subsequent sovereign debt crisis. After a strong increase in labour costs per capita in the 2000s, a noticeably subdued development followed in the 2010s in countries such as Greece, Spain and Portugal, with only weakly increasing or decreasing costs. In other countries, such as France, Italy or Finland, labour cost dynamics were also significantly weaker than the EU average during this period.

At the current margin, compared to 2021, all EU countries are experiencing increasing cost dynamics. This can be observed especially in the Eastern European countries. Since the 1990s, these countries have been catching up with the high-wage countries of Western Europe in terms of labour costs. After the outbreak of the financial market and economic crisis, this process came to a halt in some countries, such as Poland and Hungary. In the following years, however, and especially recently, rates of increase well above the EU average were recorded again, indicating a continuation of the catching-up process. For the year 2022, a strong increase in labour costs per capita (in local currency) can be seen, especially in Bulgaria (+24.7 percent) and Romania (+16.2 percent), where dynamic wage growth with high inflation compensation as well as an increase in the minimum wage caused gross compensation per capita to rise strongly.

Besides labour costs per employee, productivity is the second important component for calculating relative unit labour costs. This is measured as real gross value added per capita (employed persons).

Labour costs per capita increased slightly less in Austria than in its trading partners between 2012 and 2022.

Productivity per capita recovered significantly from the slump caused by the COVID-19 pandemic.

The subdued development of per capita productivity in 2019 was followed by a slump in 2020 (Table 2): as a result of the COVID-19 pandemic, productivity per capita in Austrian goods manufacturing fell by 6.4 percent. However, this decline was more than offset in 2021 (+12.2 percent). According to the national accounts figures published in

September 2023, per capita productivity increased again in 2022 – despite the energy crisis. At +2.8 percent, it grew more strongly than in the years before the COVID-19 crisis and also more strongly than the weighted average of the trading partners (+0.4 percent; EU trading partners +1.0 percent).

Table 1: Development of labour costs per capita (employees) in manufacturing

In national currency

| | Ø 2012-2017 | Ø 2017-2022 | Ø 2012-2022 | 2020 | 2021 | 2022 |
|---|---|-------------|-------------|--|-------|-------|
| | Percentage changes p.a. | | | Percentage changes from previous year | | |
| Austria | + 2.1 | + 2.8 | + 2.5 | - 0.7 | + 3.9 | + 5.1 |
| Belgium | + 2.0 | + 2.4 | + 2.2 | - 2.9 | + 5.3 | + 6.7 |
| Denmark | + 2.0 | + 2.5 | + 2.2 | + 1.8 | + 2.6 | + 4.1 |
| Germany | + 2.6 | + 1.6 | + 2.1 | - 2.4 | + 3.2 | + 3.0 |
| Ireland | + 3.2 | + 4.3 | + 3.7 | - 1.5 | + 1.7 | + 5.8 |
| Greece | - 2.1 | + 0.9 | - 0.6 | - 1.3 | + 3.6 | + 3.4 |
| Spain | + 0.5 | + 2.2 | + 1.3 | + 2.5 | + 4.8 | + 2.6 |
| France | + 2.0 | + 0.5 | + 1.3 | - 5.9 | + 6.0 | + 4.3 |
| Italy | + 2.1 | + 2.0 | + 2.0 | - 6.5 | +10.9 | + 3.2 |
| Luxembourg | + 2.0 | + 2.0 | + 2.0 | - 1.9 | + 5.9 | + 4.0 |
| Netherlands | + 2.0 | + 3.0 | + 2.5 | + 3.4 | + 2.8 | + 4.5 |
| Portugal | + 1.3 | + 4.4 | + 2.8 | + 0.9 | + 6.2 | + 6.3 |
| Finland | + 0.8 | + 2.5 | + 1.7 | - 0.6 | + 7.0 | + 4.0 |
| Sweden | + 2.6 | + 3.1 | + 2.9 | + 1.1 | + 6.5 | + 2.7 |
| Bulgaria | + 8.0 | +11.7 | + 9.9 | + 6.2 | +10.0 | +24.7 |
| Czech Republic | + 3.8 | + 5.3 | + 4.5 | + 0.4 | + 4.9 | + 7.8 |
| Estonia | + 5.5 | + 7.3 | + 6.4 | + 1.6 | +11.3 | + 7.1 |
| Croatia | + 0.9 | + 3.2 | + 2.0 | - 1.4 | + 7.8 | + 9.9 |
| Cyprus | - 2.0 | + 1.8 | - 0.1 | - 2.1 | + 2.0 | + 2.6 |
| Latvia | + 7.8 | + 8.1 | + 8.0 | + 2.6 | +10.4 | + 9.5 |
| Lithuania | + 7.6 | + 8.0 | + 7.8 | + 2.7 | + 9.0 | +13.0 |
| Hungary | + 4.6 | + 8.3 | + 6.4 | + 3.5 | + 8.5 | +14.0 |
| Poland | + 3.5 | + 9.1 | + 6.3 | + 6.8 | +10.7 | +11.5 |
| Romania | + 7.9 | + 8.1 | + 8.0 | + 2.9 | + 4.8 | +16.2 |
| Slovenia | + 3.0 | + 5.0 | + 4.0 | + 2.4 | + 7.3 | + 7.3 |
| Slovakia | + 4.3 | + 5.8 | + 5.1 | + 1.0 | + 7.7 | + 7.0 |
| UK | + 2.5 | + 4.0 | + 3.2 | - 1.9 | + 8.5 | + 7.0 |
| Norway | + 2.6 | + 2.9 | + 2.8 | + 0.6 | + 4.5 | + 3.8 |
| USA | + 2.0 | + 3.1 | + 2.6 | + 4.4 | + 3.7 | + 3.5 |
| Japan | + 0.9 | + 1.2 | + 1.0 | - 1.7 | + 2.3 | + 2.3 |
| Canada | + 1.7 | + 3.2 | + 2.5 | + 6.2 | - 0.9 | + 5.5 |
| All trading partners ¹ | + 2.5 | + 3.3 | + 2.9 | - 0.4 | + 5.3 | + 5.4 |
| EU trading partner ² | + 2.7 | + 3.3 | + 3.0 | - 1.0 | + 5.6 | + 5.7 |
| | Growth difference in percentage points p.a. | | | Growth difference in percentage points | | |
| Austria | | | | | | |
| All trading partners ¹ = 100 | - 0.4 | - 0.4 | - 0.4 | - 0.3 | - 1.4 | - 0.3 |
| EU trading partners ² = 100 | - 0.6 | - 0.5 | - 0.5 | + 0.3 | - 1.7 | - 0.5 |
| Germany = 100 | - 0.5 | + 1.2 | + 0.3 | + 1.8 | + 0.6 | + 2.0 |

Source: Statistics Austria, Eurostat, AMECO, national statistical offices, WIFO calculations. Japan: due to missing data, the rate of change of the overall economy was quoted for 2022. – ¹ EU trading partners (excluding Malta), Norway, the UK, the USA, Canada, and Japan; weighted average of trading partners according to WIFO calculations of single import weighting and double export weighting for industrial goods. – ² Excluding Malta, the UK; weighted average of trading partners according to WIFO calculations of single import weighting and double export weighting for industrial goods.

Table 2: **Development of productivity per capita (persons employed) in manufacturing**

In national currency

| | Ø 2012-2017 | Ø 2017-2022 | Ø 2012-2022 | 2020 | 2021 | 2022 |
|---|---|-------------|-------------|--|--------|--------|
| | Percentage changes p.a. | | | Percentage changes from previous year | | |
| Austria | + 1.7 | + 1.7 | + 1.7 | - 6.4 | + 12.2 | + 2.8 |
| Belgium | + 2.7 | - 0.4 | + 1.1 | - 3.1 | - 0.4 | - 1.2 |
| Denmark | + 3.3 | + 7.2 | + 5.2 | + 1.2 | + 18.9 | + 12.5 |
| Germany | + 2.2 | + 0.3 | + 1.3 | - 5.5 | + 11.0 | - 0.6 |
| Ireland | + 10.7 | + 13.0 | + 11.8 | + 19.3 | + 17.1 | + 17.2 |
| Greece | + 0.1 | + 3.2 | + 1.6 | + 7.6 | + 8.9 | + 0.4 |
| Spain | + 2.4 | - 0.6 | + 0.9 | - 11.5 | + 13.4 | + 2.2 |
| France | + 2.1 | - 1.4 | + 0.3 | - 9.1 | + 2.6 | - 0.7 |
| Italy | + 2.4 | - 0.0 | + 1.2 | - 11.6 | + 15.0 | - 1.3 |
| Luxembourg | + 4.3 | + 0.8 | + 2.5 | - 1.5 | + 6.0 | - 8.5 |
| Netherlands | + 2.3 | + 2.0 | + 2.1 | - 2.0 | + 10.5 | + 2.0 |
| Portugal | + 1.1 | + 0.7 | + 0.9 | - 4.4 | + 5.5 | + 1.1 |
| Finland | + 4.4 | - 1.1 | + 1.6 | - 0.8 | + 1.6 | - 3.2 |
| Sweden | + 2.0 | + 2.5 | + 2.3 | - 3.9 | + 17.8 | + 1.5 |
| Bulgaria | + 1.5 | + 5.1 | + 3.3 | - 8.0 | + 1.6 | + 30.8 |
| Czech Republic | + 2.7 | + 1.9 | + 2.3 | - 8.0 | + 5.1 | + 6.8 |
| Estonia | + 2.1 | + 3.3 | + 2.7 | - 3.8 | + 12.4 | - 3.2 |
| Croatia | + 2.7 | - 0.7 | + 1.0 | - 4.5 | + 6.6 | + 1.7 |
| Cyprus | + 4.1 | + 2.9 | + 3.5 | - 1.4 | + 3.9 | - 1.3 |
| Latvia | + 3.3 | + 3.8 | + 3.5 | + 6.1 | + 2.7 | + 0.8 |
| Lithuania | + 3.3 | + 3.5 | + 3.4 | + 2.4 | + 5.8 | + 6.7 |
| Hungary | + 1.9 | + 1.8 | + 1.8 | - 4.3 | + 7.4 | + 5.1 |
| Poland | + 0.9 | + 3.0 | + 2.0 | - 1.5 | - 1.4 | + 6.0 |
| Romania | + 3.2 | + 2.8 | + 3.0 | - 1.8 | + 14.0 | - 4.3 |
| Slovenia | + 2.6 | + 1.2 | + 1.9 | - 1.0 | + 8.8 | - 5.4 |
| Slovakia | + 3.9 | + 3.3 | + 3.6 | - 11.4 | + 12.7 | - 0.5 |
| UK | + 1.2 | + 3.1 | + 2.1 | + 2.4 | + 13.3 | - 4.7 |
| Norway | + 1.1 | - 0.3 | + 0.4 | - 3.5 | + 4.0 | - 2.1 |
| USA | + 0.9 | + 1.0 | + 1.0 | + 1.0 | + 3.9 | - 2.4 |
| Japan | + 0.9 | + 1.4 | + 1.1 | - 3.9 | + 8.9 | + 2.3 |
| Canada | + 0.9 | - 0.3 | + 0.3 | - 0.3 | - 2.9 | + 0.8 |
| All trading partners ¹ | + 2.0 | + 1.0 | + 1.5 | - 4.4 | + 8.7 | + 0.4 |
| EU trading partner ² | + 2.3 | + 1.0 | + 1.6 | - 5.6 | + 9.4 | + 1.0 |
| | Growth difference in percentage points p.a. | | | Growth difference in percentage points | | |
| Austria | | | | | | |
| All trading partners ¹ = 100 | - 0.3 | + 0.7 | + 0.2 | - 2.0 | + 3.2 | + 2.4 |
| EU trading partners ² = 100 | - 0.5 | + 0.8 | + 0.1 | - 0.8 | + 2.6 | + 1.8 |
| Germany = 100 | - 0.4 | + 1.4 | + 0.5 | - 0.9 | + 1.0 | + 3.5 |

Source: Statistics Austria, Eurostat, AMECO, national statistical offices, WIFO calculations. Japan: due to missing data, the rate of change of the overall economy was quoted for 2022. – ¹ EU trading partners (excluding Malta), Norway, the UK, the USA, Canada, and Japan; weighted average of trading partners according to WIFO calculations of single import weighting and double export weighting for industrial goods. – ² Excluding Malta, the UK; weighted average of trading partners according to WIFO calculations of single import weighting and double export weighting for industrial goods.

In Germany, where per capita productivity had slumped by 5.5 percent in 2020 due to the onset of the economic downturn in industry, a recovery also followed in 2021 (+11.0 percent), which was cut short by the energy crisis in 2022 (-0.6 percent).

Besides Germany, many other important trading partners also recorded strong productivity growth in 2021. In 2022, inflationary pressures and the energy crisis mostly allowed only subdued growth, if at all. Only Denmark (+12.5 percent) and Ireland

Between 2012 and 2022, productivity in Austria developed more dynamically than in the most important trading partners.

(+17.2 percent) were able to match the high productivity growth of the previous year. The highest growth rate was in Bulgaria (+30.8 percent). In Norway, the USA, the UK, Slovenia, Romania, Estonia, Finland and Luxembourg, on the other hand, productivity per capita fell by at least 2.1 percent (to -8.5 percent) relative to the previous year.

The comparison of productivity development with trading partners is positive for Austria in the medium term: between 2017 and 2022, productivity per capita in Austria grew by an average of 0.7 percentage points per year more strongly than the average of the trading partners, and by as much as 1.4 per-

Compared to trading partners, unit labour costs in Austrian manufacturing declined significantly in 2022.

The change in labour costs (gross compensation per capita) and productivity (gross value added per capita) results in the development of unit labour costs (labour costs per unit of production). For 2020, the corresponding national accounts value shows an increase in labour costs per unit of production of 6.0 percent, but for 2021 a considerable decrease of -7.4 percent (Table 3). This implies a significant downward revision compared to the value for 2021 shown in the previous year's article (Bittschi & Meyer, 2022; -5.4 percent). For 2022, this results in an increase in unit labour costs of 2.2 percent. In the medium-term average for the years 2017 to 2022, the annual increase is 1.1 percent, in the longer-term average 0.7 percent for 2012 to 2022.

The analysis of unit labour costs as an indicator of price competitiveness is only meaningful when the development in other countries is considered at the same time. Table 3 provides a detailed overview of the unit labour cost dynamics of the individual trading partners and the development of Austria's unit labour cost position, i.e. the real effective exchange rate deflated by unit labour costs in relation to the trading partners. In 2022, Austria's unit labour cost position improved by 3.3 percentage points compared to the weighted average of all trading partners. This is mainly a result of the significant improvement vis-à-vis the three most important trading partners Germany (+3.6 percent), USA (+19.0 percent) and Italy (+4.6 percent). With the exception of Hungary (-0.6 percent) and Bulgaria (-4.6 percent), unit labour costs also rose more strongly in all East-Central European countries than in Austria. In total, unit labour costs in manufacturing in Austria therefore developed more favourably than in the EU trading partners (-1.7 percentage points) in 2022.

centage points more strongly in relation to Germany.

The latest data also confirm this picture when looking at a ten-year time window (2012-2022). While productivity per capita grew by 1.7 percent per year in Austria, the weighted average growth of all trading partners was around 1.5 percent per year (EU trading partners +1.6 percent p.a.). In Germany, growth in the same period was 0.5 percentage points per year weaker than in Austria. Thus, productivity in Austria developed more dynamically in the medium to long term than in the most important trading partners.

4. Significant improvement in relative unit labour costs in manufacturing

Over the past ten years (2012-2022), Austria's unit labour cost position improved both compared to the weighted average of (EU) trading partners (-0.4 percentage points each) and to Germany (-0.1 percentage point).

The graphical representation highlights trend reversals and long-term changes (Figure 2). According to this, the price competitiveness of Austrian goods manufacturing improved considerably compared to the average of all trading partners in the second half of the 1990s. After an opposing trend in the early 2000s, Austria saw an improvement until the outbreak of the financial and economic crisis. The economic crisis triggered another trend reversal, with a deterioration in the relative unit labour costs of Austrian industry in 2009-2010. From 2010 to 2020, there was a fluctuating, but largely stable development compared to the weighted average of trading partners. Since 2021, however, there has been a distinct improvement in unit labour costs relative to the weighted average of trading partners. Compared to Germany, however, Austria's unit labour cost position is very stable.

The comparison of the time series of relative unit labour costs and relative labour costs (gross compensation per capita, Figure 2) implicitly shows how productivity in Austria developed in comparison with trading partners. If unit labour costs declined more strongly than relative gross compensation, productivity in Austria developed more favourably than in the other countries. A parallel development of both time series signals an even progress in productivity, while a stronger decline in the gross compensation time series than in relative unit labour costs time series a deterioration in productivity in Austria relative to its trading partners. The

even course of both components in recent years thus reflects a relatively even productivity progress. However, Figure 2 also shows that from 2020 onwards (in comparison to Germany already from 2017 onwards) productivity in Austria has developed significantly better relative to trading partners than labour costs – and this thus explains the favourable development of unit labour costs to a large extent. However, the development at the current margin should be interpreted with caution due to the COVID-19 measures as well as the strong influence of inflation and the associated government price interventions. Price interventions can dampen inflation in the short term and thus lead to a weaker pass-through of rising prices into labour costs, but bear the risk of higher inflation in the medium and long term. In addition, possible revisions of the national accounts must be taken into account.

Unit labour costs developed heterogeneously in the individual countries. The development is also characterised by institutional

peculiarities⁴. This applies in particular to the average development of the last five years, which were characterised by strong state intervention, both in connection with the COVID-19 pandemic and with the high inflation rates in the wake of the Russian war of aggression. Comparing Austria with economies that are similar in terms of population and GDP per capita therefore shows a very divergent development of unit labour costs for the last five years (2017-2022). It was significantly more favourable than in Austria (+1.1 percent p.a.), for example, in Denmark (-4.4 percent p.a.) and in Sweden (-1.4 percent p.a.). In contrast, the increase in Belgium (+2.9 percent p.a.) or Finland (+3.6 percent p.a.) was much stronger than in Austria. In the Eastern Central European EU countries, unit labour cost dynamics accelerated noticeably in the last five years, as productivity did not keep pace with labour cost dynamics despite robust growth rates. Only in Hungary (+1.4 percent p.a.) was unit labour cost growth comparable to that in Austria in 2017-2022.

Influenced by very high inflation rates, labour costs in the East-Central European EU countries developed much more dynamically than productivity.

5. Slight increase in overall economic unit labour costs in international comparison

In addition to the unit labour costs in manufacturing, the competitiveness of Austrian exports is also partly determined by further sectors of the economy. Since services and non-tradable goods are required as intermediate inputs, their cost development has an influence on the competitiveness of the sectors involved in foreign trade (Deutsche Bundesbank, 1998). However, unit labour costs across all sectors are also significantly influenced by sectors in which productivity growth is conceptually difficult to measure, such as the public sector. Accordingly, total unit labour costs should also be interpreted with caution. Caution is also required in the interpretation because the most recent data are still subject to revisions and government measures to combat inflation differ internationally. This also results in considerable heterogeneity in the pass-through of inflation into labour costs.

In Austria, labour costs per unit of output across all sectors increased by 2.5 percent in

2022, 0.8 percentage points weaker than in Germany, while the difference to the weighted average of EU trading partners or all trading partners is -1.4 and -2.7 percentage points, respectively.

In the long term (2012-2022), unit labour costs in the overall economy in Austria grew 0.5 percentage points p.a. faster than the average of the EU trading partners and slightly faster than in Germany (+0.2 percentage points p.a.).

In the longer term the dynamics of total economy unit labour costs are significantly stronger than those of unit labour costs in goods production, both in Austria and among trading partners. This is in line with expectations, as the greatest potential for increasing labour productivity through mechanisation and automation exists in manufacturing.

In 2022, unit labour cost developments were more favourable in the Austrian economy than in the trading partners economies.

⁴ In Ireland, for example, a correction to the national accounts in 2015 led to an oversized increase in productivity. The new national accounts rules provide for the inclusion of income from intellectual property rights held in Ireland in Irish GDP (OECD, 2016). This relates primarily to manufacturing, thus more accurately reflecting economic activity in Ireland, but distorts the

assessment of unit labour costs. The presentation of unit labour cost development in manufacturing can only fully take into account intellectual property rights if the production and allocation of these rights take place in the same country. However, this is not necessarily the case in global value chains.

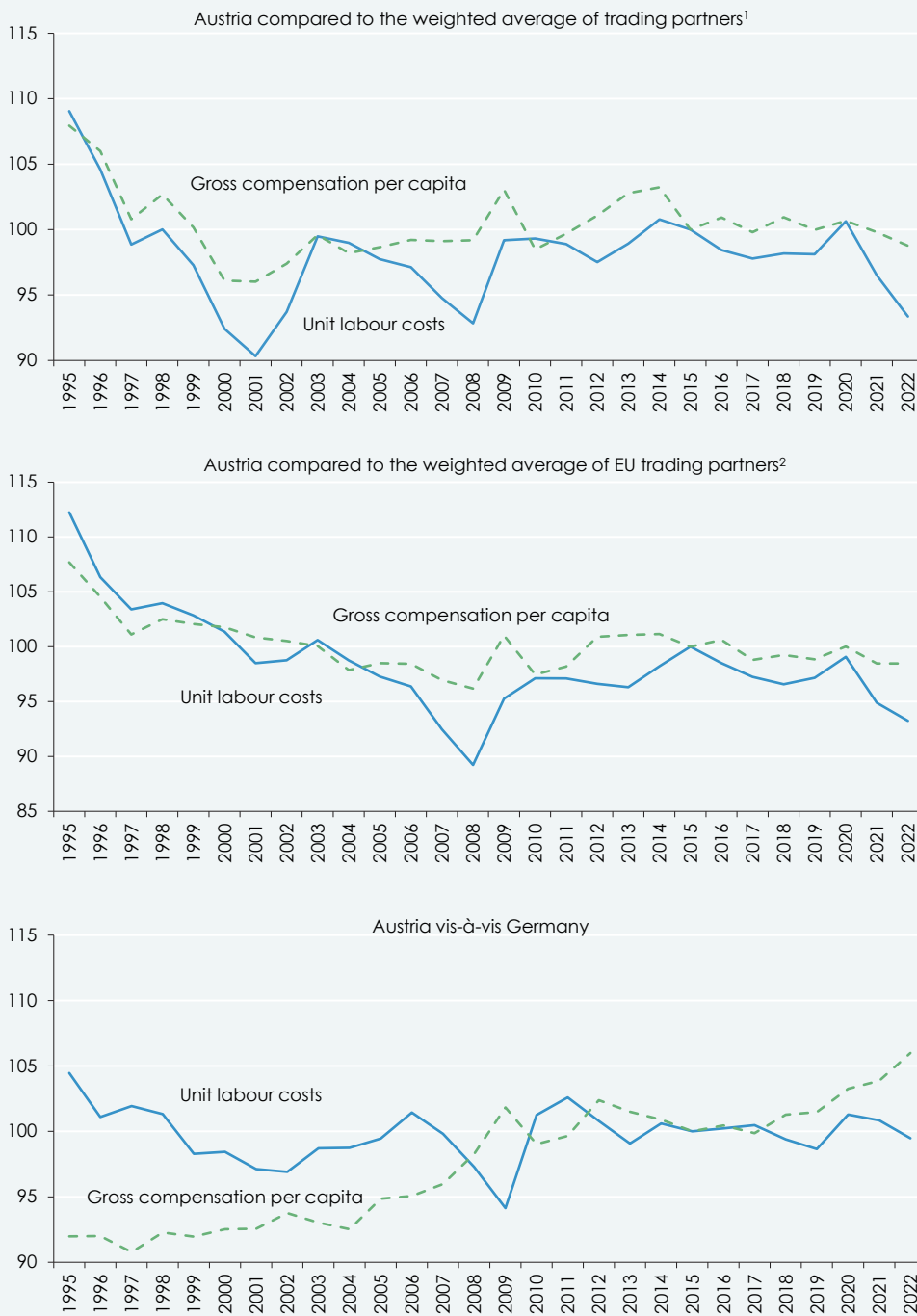
Table 3: **Development of unit labour costs per capita (persons employed) in manufacturing and in the economy as a whole**
In €

| | Ø 2012-2017 | Ø 2017-2022 | Ø 2012-20221 | 2020 | 2021 | 2022 |
|---|---|-------------|--------------|--|-------|-------|
| | Percentage changes p.a. | | | Percentage changes from previous year | | |
| Manufacturing | | | | | | |
| Austria | + 0.4 | + 1.1 | + 0.7 | + 6.0 | - 7.4 | + 2.2 |
| Belgium | - 0.7 | + 2.9 | + 1.1 | + 0.2 | + 5.7 | + 8.0 |
| Denmark | - 1.2 | - 4.4 | - 2.8 | + 0.8 | -13.6 | - 7.4 |
| Germany | + 0.4 | + 1.3 | + 0.8 | + 3.3 | - 7.0 | + 3.6 |
| Ireland | - 6.8 | - 7.7 | - 7.2 | -17.4 | -13.2 | - 9.7 |
| Greece | - 2.2 | - 2.3 | - 2.2 | - 8.3 | - 4.8 | + 3.0 |
| Spain | - 1.8 | + 2.8 | + 0.5 | +15.8 | - 7.6 | + 0.4 |
| France | - 0.0 | + 1.9 | + 0.9 | + 3.6 | + 3.3 | + 5.0 |
| Italy | - 0.3 | + 2.0 | + 0.8 | + 5.8 | - 3.6 | + 4.6 |
| Luxembourg | - 2.2 | + 1.1 | - 0.6 | - 0.4 | - 0.2 | +13.7 |
| Netherlands | - 0.3 | + 1.0 | + 0.3 | + 5.5 | - 7.0 | + 2.5 |
| Portugal | + 0.2 | + 3.8 | + 2.0 | + 5.5 | + 0.7 | + 5.1 |
| Finland | - 3.4 | + 3.6 | + 0.1 | + 0.1 | + 5.3 | + 7.5 |
| Sweden | - 1.4 | - 1.4 | - 1.4 | + 6.2 | - 6.6 | - 3.4 |
| Bulgaria | + 6.5 | + 6.3 | + 6.4 | +15.4 | + 8.2 | - 4.6 |
| Czech Republic | + 0.1 | + 4.7 | + 2.4 | + 5.8 | + 2.9 | + 5.4 |
| Estonia | + 3.4 | + 3.9 | + 3.6 | + 5.6 | - 1.0 | +10.6 |
| Croatia | - 1.5 | + 3.7 | + 1.0 | + 1.7 | + 1.3 | + 7.9 |
| Cyprus | - 5.8 | - 1.1 | - 3.5 | - 0.7 | - 1.8 | + 4.0 |
| Latvia | + 4.2 | + 4.2 | + 4.2 | - 3.2 | + 7.5 | + 8.6 |
| Lithuania | + 4.1 | + 4.3 | + 4.2 | + 0.3 | + 3.0 | + 6.0 |
| Hungary | + 1.3 | + 1.4 | + 1.4 | + 0.1 | - 1.0 | - 0.6 |
| Poland | + 2.2 | + 3.9 | + 3.1 | + 4.9 | + 9.2 | + 2.5 |
| Romania | + 4.0 | + 3.5 | + 3.8 | + 2.8 | - 9.6 | +21.2 |
| Slovenia | + 0.3 | + 3.8 | + 2.0 | + 3.4 | - 1.4 | +13.4 |
| Slovakia | + 0.4 | + 2.4 | + 1.4 | +14.0 | - 4.4 | + 7.5 |
| UK | - 0.3 | + 1.5 | + 0.6 | - 5.4 | - 1.0 | +13.3 |
| Norway | - 2.9 | + 1.6 | - 0.7 | - 4.2 | + 6.0 | + 6.7 |
| USA | + 3.7 | + 3.5 | + 3.6 | + 1.4 | - 3.7 | +19.0 |
| Japan | - 4.1 | - 1.9 | - 3.0 | + 2.5 | -11.9 | - 5.9 |
| Canada | - 1.8 | + 4.9 | + 1.5 | + 3.5 | + 5.3 | +13.4 |
| All trading partners ¹ | + 0.3 | + 2.0 | + 1.2 | + 3.4 | - 3.4 | + 5.7 |
| EU trading partner ² | + 0.2 | + 1.9 | + 1.1 | + 4.0 | - 3.3 | + 4.0 |
| | Growth difference in percentage points p.a. | | | Growth difference in percentage points | | |
| Austria | | | | | | |
| All trading partners ¹ = 100 | + 0.1 | - 0.9 | - 0.4 | + 2.6 | - 4.1 | - 3.3 |
| EU trading partner ² | + 0.1 | - 0.8 | - 0.4 | + 2.0 | - 4.2 | - 1.7 |
| Germany = 100 | - 0.1 | - 0.2 | - 0.1 | + 2.7 | - 0.4 | - 1.4 |
| | Percentage changes p.a. | | | Percentage changes from previous year | | |
| Overall economy | | | | | | |
| Austria | + 1.8 | + 3.0 | + 2.4 | + 7.4 | + 0.7 | + 2.5 |
| All trading partners ¹ | + 1.1 | + 2.9 | + 2.0 | + 3.7 | - 0.0 | + 5.4 |
| EU trading partner ² | + 1.1 | + 2.7 | + 1.9 | + 3.8 | + 0.2 | + 4.0 |
| | Growth difference in percentage points p.a. | | | Growth difference in percentage points | | |
| Austria | | | | | | |
| All trading partners ¹ = 100 | + 0.7 | + 0.1 | + 0.4 | + 3.5 | + 0.7 | - 2.7 |
| EU trading partners ² = 100 | + 0.7 | + 0.4 | + 0.5 | + 3.4 | + 0.6 | - 1.4 |
| Germany = 100 | + 0.1 | + 0.3 | + 0.2 | + 3.7 | + 0.6 | - 0.8 |

Source: Statistics Austria, Eurostat, AMECO, national statistical offices, WIFO calculations. Unit labour costs: ratio of gross compensation per capita (employees) to real gross value added or real GDP per capita (persons employed). Japan: due to missing data, the rate of change of the overall economy was quoted for 2021. - ¹ EU trading partners (excluding Malta), Norway, the UK, the USA, Canada, and Japan; weighted average of trading partners according to WIFO calculations of single import weighting and double export weighting for industrial goods and for the total economy, respectively. - ² Excluding Malta, the UK; weighted average of trading partners according to WIFO calculations of the single import weighting and double export weighting for industrial goods or for the total economy.

Figure 2: **Development of relative labour costs and unit labour costs in manufacturing**

In €, 2015 = 100



Source: Statistics Austria, Eurostat, AMECO, national statistical offices, WIFO calculations. – ¹ EU trading partners (excluding Malta), Norway, the UK, the USA, Canada, and Japan. – ² Excluding Malta, the UK.

6. Summary

The available data show again a significant decline in relative unit labour costs for 2022. Relative to trading partners, this favourable development results from both a weaker increase in labour costs and stronger productivity growth. Specifically, labour costs in manufacturing in Austria rose 0.3 percentage points less than the weighted average

of trading partners in 2022. The value added per employees in manufacturing in 2022 also developed more favourably than the average of the trading partners (+2.4 percentage points) and significantly more favourably than in the most important trading partner Germany (+3.5 percentage points).

In total, unit labour costs in Austrian manufacturing rose by +2.2 percent, 3.3 percentage points weaker than the weighted average of trading partners. Compared to Germany, unit labour costs declined by 1.4 percentage points.

The longer-term observation of relative unit labour costs in domestic goods manufacturing initially shows a strong decline between 1995 and 2001, followed by two years of increase. In a long-term comparison, unit labour costs in 2020 compared to the weighted average of the (EU) trading partners were roughly at the same level as in 2003. Compared to Germany, the development has been stable for a good two decades, even if significant fluctuations can be observed in crisis years. However, it is striking that the stable unit labour cost development compared to Germany is determined by the more favourable productivity development in Austria, while labour costs in this country are rising much more dynamically. In an international comparison, Austria recorded a much more positive development

of unit labour costs than its trading partners in 2022.

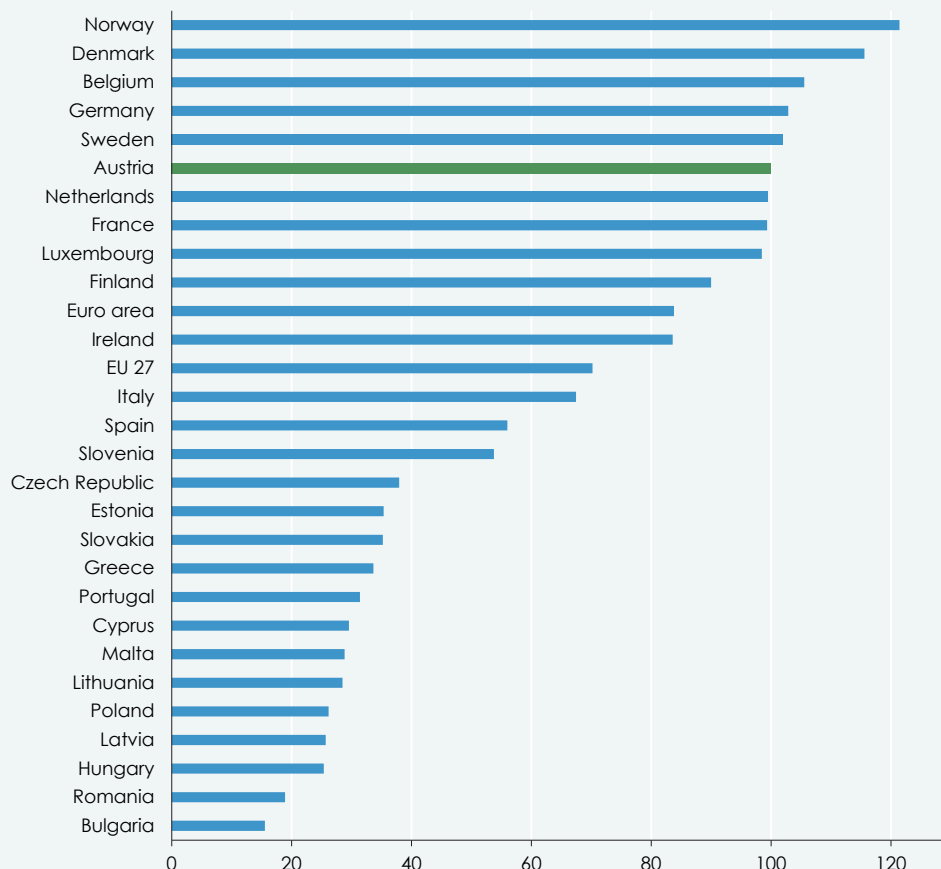
The total economy's unit labour costs grew 2.7 percentage points slower in Austria in 2022 than the average of all trading partners and 1.4 percentage points slower than in the EU trading partners. There was also an improvement of 0.8 percentage points compared to Germany in 2022.

The improvement in relative unit labour costs was also supported by exchange rate developments. The nominal effective exchange rate fell by 0.7 percent in 2022 because the euro depreciated against the dollar and the Swiss franc in particular.

When interpreting the results, it is also important to take into account possible distortions due to the different country-specific approaches to cushioning inflation. The medium- and longer-term developments may also have been distorted by the relief measures in the wake of the COVID-19 pandemic.

Figure 3: **Labour costs in manufacturing compared internationally**

Labour costs per hour in €, 2021, Austria = 100



Source: Eurostat, Office for National Statistics (UK), Labour Force Survey 2016, Labour Cost Index, WIFO, WIFO calculations. Without apprentices.

7. Annex: Hourly labour costs in manufacturing

While only data on labour costs per worker are available for the calculation of current, internationally comparable unit labour costs in manufacturing, labour costs per hour worked can also be considered for the European countries. They are based on the Labour Force Survey, which is conducted in the EU countries every four years. The annual development between two surveys is updated using a Labour Cost Index. The results published here are based on the Eurostat Labour Cost Index and the Labour Force Survey of 2020.

Unlike the Labour Force Survey, the Labour Cost Index is not calculated according to the same statistical concept in all countries. This limits international comparability. Due to these methodological limitations, the values of the Labour Cost Index should be interpreted with caution. For Austria, the index is

based on data from the business survey. In some cases, these data may deviate noticeably from the national accounts values for the development of gross compensation, which form the basis of the unit labour cost calculations. This may also be because labour costs, unlike national accounts gross wages, include wage-related taxes of employers in addition to social security contributions. It should also be noted that labour costs are a measure of the burden on the factor labour, but do not allow any conclusions to be drawn about the incidence, i.e., about who ultimately bears these costs. For the years since 2020, it should also be taken into account that government aid measures in the context of the COVID-19 pandemic and the energy crisis, which affect the labour factor, could distort the values presented in this paper.

Table 4: Labour costs per hour in manufacturing

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | Ø 2017-2022 Percentage change |
|----------------|-------|-------|-------|-------|-------|-------|-------------------------------------|
| | In € | | | | | | |
| Bulgaria | 4.24 | 4.60 | 5.15 | 5.41 | 5.78 | 6.83 | +10.0 |
| Romania | 5.45 | 6.02 | 6.60 | 7.00 | 7.30 | 8.29 | + 8.8 |
| Hungary | 9.05 | 9.61 | 10.46 | 10.32 | 10.78 | 11.13 | + 4.2 |
| Latvia | 7.80 | 8.79 | 9.51 | 10.12 | 10.31 | 11.27 | + 7.6 |
| Poland | 8.63 | 9.31 | 9.86 | 10.07 | 10.60 | 11.48 | + 5.9 |
| Lithuania | 8.08 | 8.79 | 9.31 | 9.79 | 11.03 | 12.50 | + 9.1 |
| Malta | 10.31 | 10.94 | 10.98 | 11.15 | 11.58 | 12.66 | + 4.2 |
| Cyprus | 11.54 | 11.92 | 12.44 | 12.24 | 12.56 | 12.97 | + 2.4 |
| Portugal | 11.31 | 11.69 | 11.83 | 12.75 | 13.12 | 13.78 | + 4.0 |
| Greece | 13.51 | 13.82 | 14.37 | 14.28 | 13.94 | 14.77 | + 1.8 |
| Slovakia | 11.15 | 12.09 | 12.92 | 13.37 | 14.20 | 15.46 | + 6.7 |
| Estonia | 11.07 | 11.77 | 12.59 | 12.98 | 13.58 | 15.51 | + 7.0 |
| Czech Republic | 11.42 | 12.75 | 13.75 | 14.32 | 15.19 | 16.65 | + 7.8 |
| Slovenia | 18.68 | 19.38 | 20.09 | 20.42 | 21.77 | 23.59 | + 4.8 |
| Spain | 22.66 | 22.82 | 23.29 | 24.23 | 24.01 | 24.57 | + 1.6 |
| Italy | 27.38 | 27.73 | 28.67 | 29.41 | 28.82 | 29.59 | + 1.6 |
| EU 27 | 26.84 | 27.65 | 28.53 | 29.14 | 29.37 | 30.80 | + 2.8 |
| Ireland | 31.70 | 32.42 | 33.58 | 33.12 | 34.81 | 36.66 | + 3.0 |
| Euro area | 32.79 | 33.63 | 34.55 | 35.18 | 35.22 | 36.76 | + 2.3 |
| Finland | 36.31 | 36.72 | 36.94 | 36.79 | 38.26 | 39.48 | + 1.7 |
| Luxembourg | 39.50 | 40.08 | 40.73 | 40.98 | 41.18 | 43.19 | + 1.8 |
| France | 39.09 | 40.10 | 40.93 | 41.94 | 42.07 | 43.57 | + 2.2 |
| Netherlands | 36.84 | 37.72 | 38.52 | 40.13 | 40.65 | 43.62 | + 3.4 |
| Austria | 37.33 | 38.59 | 39.78 | 40.84 | 41.45 | 43.86 | + 3.3 |
| Sweden | 43.18 | 41.82 | 41.97 | 42.03 | 45.54 | 44.72 | + 0.7 |
| Germany | 40.50 | 41.71 | 42.83 | 43.22 | 43.13 | 45.12 | + 2.2 |
| Belgium | 40.47 | 41.16 | 42.01 | 42.74 | 43.30 | 46.29 | + 2.7 |
| Denmark | 44.34 | 45.34 | 46.68 | 47.37 | 49.38 | 50.69 | + 2.7 |
| Norway | 50.15 | 49.88 | 50.11 | 47.10 | 51.25 | 53.26 | + 1.2 |

Source: Eurostat, Labour Force Survey 2020, Labour Cost Index, WIFO, WIFO calculations. Excluding apprentices.

Table 4 shows the labour costs per hour determined on the basis of the Labour Cost Index for the period 2017-2022. In 2022, the average hourly labour cost in Austria's manufacturing industry was 43.86 €. Austria thus

took sixth place in the European comparison, as in the previous year. Since 2017, hourly labour costs in Austria have been growing by 3.3 percent p.a., half a percentage point faster than the EU 27 average

(+2.8 percent p.a.), and 1 percentage point faster than in the euro area (+2.3 percent p.a.) or Germany (+2.2 percent p.a.). Compared to the previous year, the increase in

2022 was 5.8 percent in Austria, 4.9 percent in the EU average and 4.6 percent in Germany.

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