

Corporate profits and inflation

In 2021-2022, inflation increased significantly in Denmark and several other countries. This has been reflected in a diverse development in corporate profits across industries. Large parts of the private sector saw weak profit growth during the period with high inflation. Conversely, profits have been strong in selected industries where prices reflect global conditions, and where there have been supply problems and an increase in demand. These developments generally conform with historical experiences. There are consequently no clear indications that the competitive situation has changed towards corporate market power having increased, thereby acting as a driver of inflation.

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Higher prices have not resulted in increased corporate profits in general in the high-inflation period

The high inflation must be seen in conjunction with strong demand, while supply problems have affected selected industries such as energy, utilities, transport, and agriculture, where profits have been high. These factors primarily reflect global conditions and do not reflect domestic price formation. In industries that use, for example, energy and transport services in their production, profits fell slightly during the period with high inflation. These developments follow the historical pattern.



Large differences in profits across industries

There are significant differences in the development in profits across industries. In the manufacturing industry, for example, profits per unit of output have fallen, while profits have developed more strongly in trade and in the restaurant industry. The differences may reflect industry-specific supply and demand conditions, differences in production structures and use of commodities and other raw materials in production as well as differences in the competitive situation.



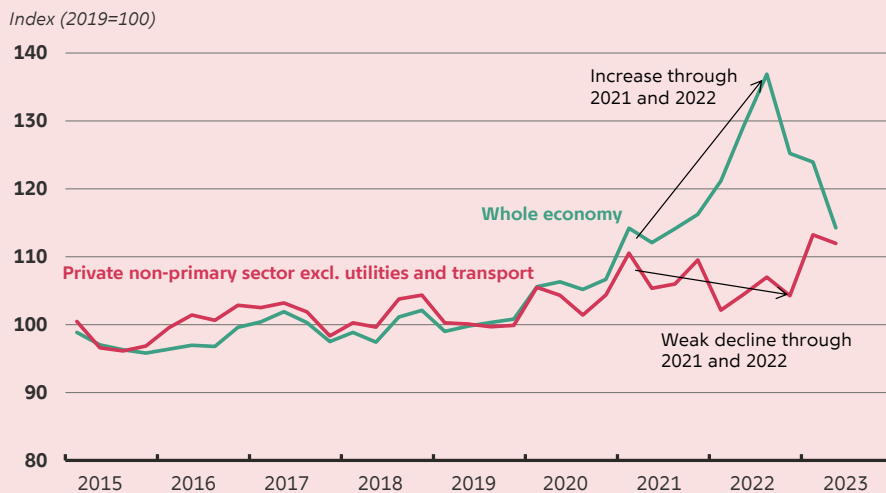
The correlation between inflation, profits and corporate market power is not clear cut

Increased profits do not necessarily reflect a change in corporate market power, i.e. the ability of companies to set prices higher than their costs of production. Higher costs of input materials or changes in demand may shift the distribution between payroll costs and profits in companies, and the adjustment may resemble a temporary wage-price spiral. In the long term, the income distribution is expected to stabilise around the pre-pandemic level.

Why is this important?

One of Danmarks Nationalbank's main objectives is to ensure stable prices. Therefore, it is important to understand inflationary drivers. It has been debated in both Denmark and internationally whether and to what extent corporate behaviour has been the cause of high inflation. This analysis sheds light on these questions in a Danish context to qualify the Danish debate.

Main chart: Higher prices have generally not resulted in increased corporate profits in period with rising energy prices



Source: Statistics Denmark and own calculations



Keywords

Inflation and price development

Danish economy

01 Higher prices have not resulted in increased corporate profits in general in the high-inflation period

At the beginning of 2021, inflation started to rise sharply in several countries, including Denmark. Although inflation has abated in recent months, the period 2021-2023 has been characterised by significantly higher inflation than in the previous decades. The higher inflation reflects a number of factors, including significant increases in the prices of a number of commodities, which has resulted in rising costs for companies. Across industries, there have also been large differences in the development in profits, while the development in payroll costs has generally been more subdued.¹

This analysis looks at the development in profits in Denmark since 2019 and examines whether there are indications that the higher inflation also reflects higher profits. In the euro area, it has been suggested that in the period of high inflation, companies increased prices by more than the increase in costs would suggest, thereby increasing profits. The increase in profits in the euro area happened in light of the uncertainty over costs that arose in connection with the substantial increases in energy prices in combination with strong demand.²

Inflation is usually assessed based on the development in consumer prices (HICP). However, it is not possible, based on consumer price data, to establish whether a price increase reflects increased payroll costs and costs of materials for companies or whether they have increased their profits. This distinction can, however, be made by looking at the price development of Danish value added, calculated at base prices, i.e. the rate of increase in the gross value added (GVA) deflator, which is therefore used as a measure of inflation in this analysis.

The GVA deflator is linked to HICP inflation, see chart 1. However, there are differences between the two calculation methods and, for example, increasing costs of materials and rising import prices will typically result in an increase in HICP, but will not necessarily affect the GVA deflator, see box 1.

¹ For a more detailed description of the correlation between wages and inflation and how the development in wages is expected to affect inflation in the coming years, see Hansen and Jensen (2023).

² See, for example, Arce et al. (2023) and Lagarde (2023).

BOX 1

Corporate profits and their effect on inflation are analysed using GVA deflator

The GVA deflator describes the development in the price of Danish value added, calculated at base prices. Base prices include 'other production taxes, net', but not product taxes.

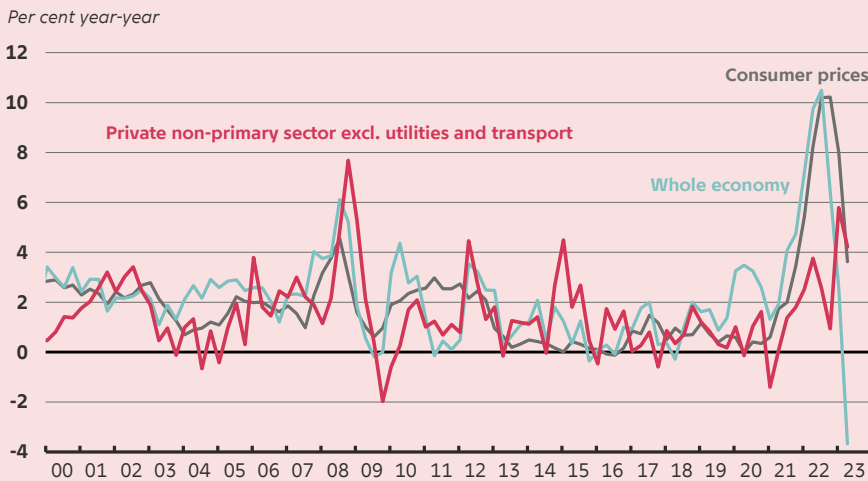
The differences between the GVA deflator and HICP are due to several factors: Prices are calculated differently in HICP and the GVA deflator, which means that the two indicators develop differently to some extent. In addition, costs of materials are not included in GVA, while rising costs of materials will typically result in higher consumer prices. Finally, there is a difference in the weight with which the various goods and services are included. For example, unlike consumer prices, GVA does not contain imported goods. Therefore, a strong development in import prices will pull towards consumer prices rising more than the GVA deflator.

Technically, in relation to the national accounts, GVA can be divided into contributions from remuneration of three subcomponents: labour, taxes/subsidies and corporate profits. An increase in the GVA deflator may thus reflect that payroll costs are increasing or that labour is becoming less productive, so that more labour must be used to generate a given GVA. Both cases give a higher contribution from unit labour costs. An increase in the GVA deflator may also reflect increased production taxes or that production subsidies are being phased out. An increase in GVA may thus also reflect increasing profits.

The profits are used for remuneration of the capital etc. and are occasionally referred to as 'residual income', which is the part of GVA that remains after deduction of payroll costs and other taxes. In the analysis, the term 'profits' is used instead of 'residual income'. From a strict theoretical economic perspective, a distinction is made between residual income and pure economic profit as economic profit also includes opportunity costs, i.e. the return that the company could alternatively have achieved by investing in, for example, securities rather than in capital for production.

CHART 1

Correlation between consumer prices and GVA deflator



Source: Statistics Denmark.

Chart 1 shows that the GVA deflator for the Danish economy as a whole rose substantially in the period 2021-2022 with high consumer price inflation, while it has recently declined sharply due to a number of factors, including falling energy prices. However, in large parts of the economy, the GVA deflator has developed more moderately overall. This can be illustrated by looking at the private non-primary sector excl. utilities and transport. The private non-primary sector

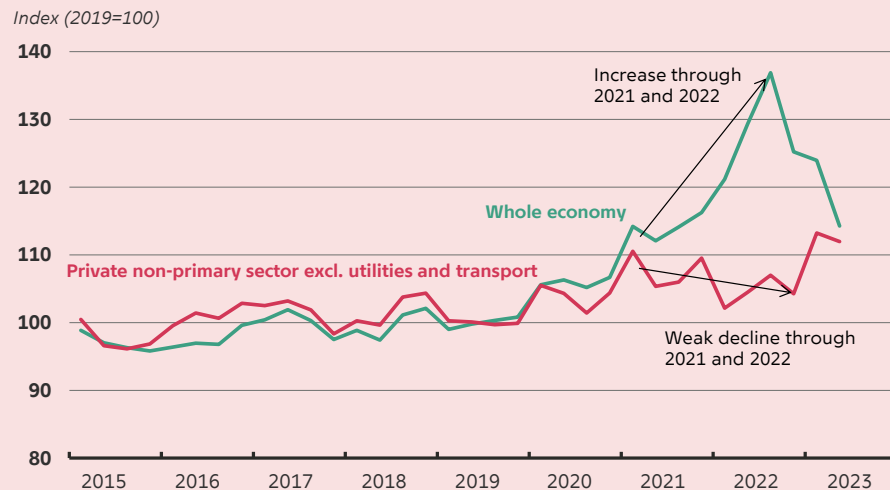
comprises most of the private sector, with the exception of mining and quarrying, agriculture and fisheries.

The difference between the deflator for private non-primary sector excl. utilities and transport and the deflator for the overall economy underlines that the large increases in the GVA deflator are primarily driven by selected industries. These are transport, utilities, mining and quarrying and agriculture, which are characterised by reflecting domestic conditions only to a limited extent, see also Chapter 2, *Large differences in profits across industries*.

The GVA deflator can be divided into contributions from wages, corporate profits and tax payments. In the private non-primary sector excl. utilities and transport, profits per unit of output decreased slightly in 2021-22 where energy prices rose substantially. Profits are calculated in Danish kroner, and this must be taken into account when looking at the decrease, as the profits are moderately increasing as a result of the underlying price development in the long term. Profits only recovered in Q1 2023, which is probably connected with energy prices having started to fall in October 2022. In turn, profits in the economy as a whole increased in 2021-2022. This reflects that a non-negligible part of the Danish economy is constituted by industries in which the GVA deflator increased very sharply because of global conditions.³

CHART 2

Profits per unit of output increased in the aggregate in the period with rising energy prices, but declined in the private non-primary sector excl. utilities and transport



Note: The chart shows profits per unit of output, measured by profits above real GVA. Profits have been calculated in nominal terms and therefore show an upward trend over time. The trend growth makes the decline in the private non-primary sector excl. utilities and transport during 2021 and 2022 more marked.

Source: Statistics Denmark and own calculations.

³ Overall, transport, utilities, mining and quarrying and agriculture accounted for just under 10 per cent of Danish GVA in 2019.

Developments are in line with historical contexts

Overall, the increase in profits in the economy is in conformity with the usual pattern seen in situations with rising energy prices. The usual pattern can be analysed on the basis of estimates of how profits normally react to changes in oil prices, see box 2. The analysis indicates that higher energy prices lead to temporary increases in overall profits per unit of output in Denmark. It should be taken into consideration in this connection that production of commodities forms part of the Danish economy. Therefore, when commodity prices rise, there is a part of the economy in which profits will naturally increase.

The development of profits in the overall private non-primary sector excl. utilities and transport is also in accordance with the usual pattern, see box 2. It should be taken into consideration that companies in these industries use energy as production input. When energy prices rise, this thus corresponds to an increase in costs of materials, resulting in rising production costs. In the short term, companies may absorb part of the higher costs in their profits, which thereby decline. This is confirmed by the analysis in box 2, which also shows that the negative effect on profits is typically only present in approx. four quarters, after which the decline in profits has been recouped. This is in conformity with the recovery of profits per unit of output in Q1 2023, when, moreover, energy prices declined, see chart 2.

A comparison with how profits have historically reacted to oil price changes gives an idea of what could be expected in light of the energy price increases seen during 2021 and 2022. However, an assessment of the exact magnitude of fluctuations in prices and profits requires up-to-date information on the exact scale of the shocks to energy prices. The analysis thus does not provide a clear answer to whether profits in the private non-primary sector excl. utilities and transport could have been expected to fall by more than what was actually observed during the period with rising energy prices. If the actual fall in profits has been lower than the increase in energy prices would indicate, seen in isolation, this may, for example, reflect that strong demand has supported sales prices in the private non-primary sector.

BOX 2

An increase in energy prices typically leads to an increase in profits for the overall Danish economy, but to a decrease in the private non-primary sector excl. utilities and transport

The following empirical analysis shows how profits per unit of output in the overall economy and in the private non-primary sector excl. utilities and transport, respectively, typically develop when the Danish economy is hit by oil price increases.

To establish the causal effect from oil price increases on changes in profits, the exogenous variation in oil prices is first obtained. Exogenous variation in oil prices follows Känzig (2021), which identifies the shocks using high-frequency information regarding OPEC meetings.

The causal effect of an oil price increase on profits per unit of output has subsequently been estimated using local projections. Four lags are used, and the time series for profits is first detrended using an HP filter and then seasonally adjusted.

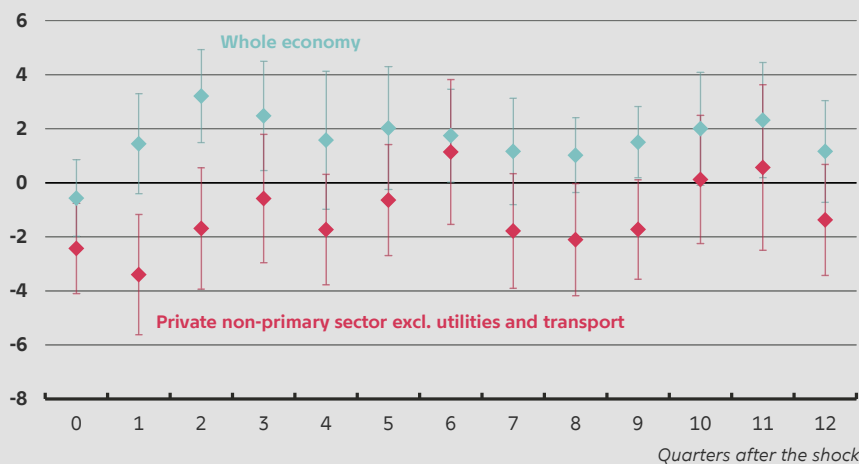
The results, shown in chart A, are to be interpreted as the typical percentage deviation in profits per unit of output from the trend development following an oil price increase. The size of the shock has been scaled so that consumer prices for energy in Denmark increase by 10 per cent when the shock hits. Quarterly data from Q1 1990 to Q4 2022 have been used.

Profits for the overall Danish economy typically increase as a result of a positive shock to oil prices. This reflects that a significant part of the profits generated in Denmark depend positively on the price of energy. However, due to rigidities in the adjustment of sales prices, industries that use energy as production input often have a negative correlation between energy prices and profits. This applies, for example, to the private non-primary sector excl. utilities and transport. However, the negative correlation quickly ebbs out, and less than a year after the shock, profits have in general bounced back to the trend level.

Chart A

When the oil price increases, profits per unit of output temporarily increase in the Danish economy as a whole, but fall overall in the private non-primary sector excl. utilities and transport

Percentage points



Note: The vertical lines indicate Newey-West standard errors (68 % confidence band) in line with Känzig (2021).

Source: Känzig (2021), Statistics Denmark and own calculations

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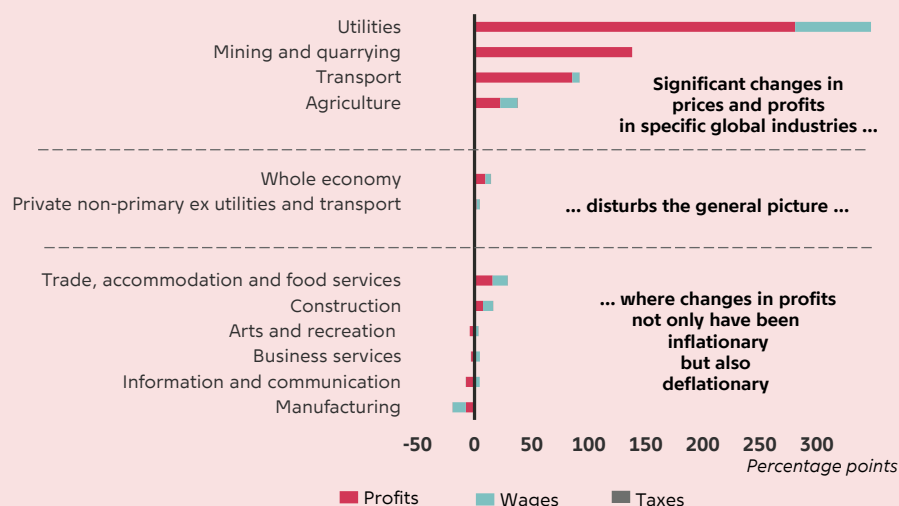
Large differences in profits across industries

The overall increase in the GVA deflator and corporate profits covers significant differences across industries, see chart 3. The chart focuses on the period Q4 2019 to Q4 2022, i.e. from just before the outbreak of the coronavirus pandemic and until inflation peaked at the end of 2022.⁴

CHART 3

Large differences in price development and drivers across industries

Q4 2019 – Q4 2022



Note: The chart shows the total increase in the GVA deflator broken down by contributions from wages, profits, and taxes. In 2019, the GVA of the industries, relative to aggregate GVA, amounted to 1.9 per cent for utilities, 0.8 per cent for mining and quarrying, 5.4 per cent for transport, 1.6 per cent for agriculture, 62 per cent for private non-primary sector excl. utilities and transport, 14.6 per cent for trade and restaurants, 5.3 per cent for construction, 3.1 per cent for culture and leisure, 9.6 per cent for business services, 4.9 per cent for information and communication and 15.4 per cent for the manufacturing industry. The percentages do not add up to 100 because some sectors, such as public administration, have been omitted and because an average over 2019 is taken.

Source: Statistics Denmark and own calculations.

⁴ One of the reasons for choosing this period is to avoid that the introduction of various compensation schemes introduced during the period in connection with the lockdowns of society blurs the picture. By looking at the period since before the lockdowns, the effect of the compensation schemes is offset, as they are virtually no longer used.

Strong profits in global industries

In the mining and quarrying, utilities and transport industries, where the GVA deflator increased very sharply, the increase primarily went to corporate profits. However, the deflator has decreased significantly since the turn of the year in all three industries. Together with agriculture, the three industries are characterised by prices being largely determined by global supply and demand. In addition, these industries have been characterised by supply problems and, in some cases, also a sharp increase in demand in the wake of the pandemic.

For example, the increased demand posed great challenges in many commodity markets. Here, supply could not adjust to increased global demand in the short term, resulting in a heavy increase in commodity prices on the global market. Danish companies followed the higher global market prices, and profits per unit of output in, for example, mining and quarrying therefore increased significantly, see chart 3. However, the increase in prices cannot be regarded as active action taken by the individual commodities producer to increase its profits, as the companies have limited pricing options when trading on international exchanges.

The utilities industry also comprises a number of activities where prices are largely determined internationally, such as electricity and gas supply. In this industry, profits thus also rose sharply, without this reflecting a changed approach to pricing among the producers. The same applies to agriculture, where profits were supported by global price increases for a wide range of agricultural products.

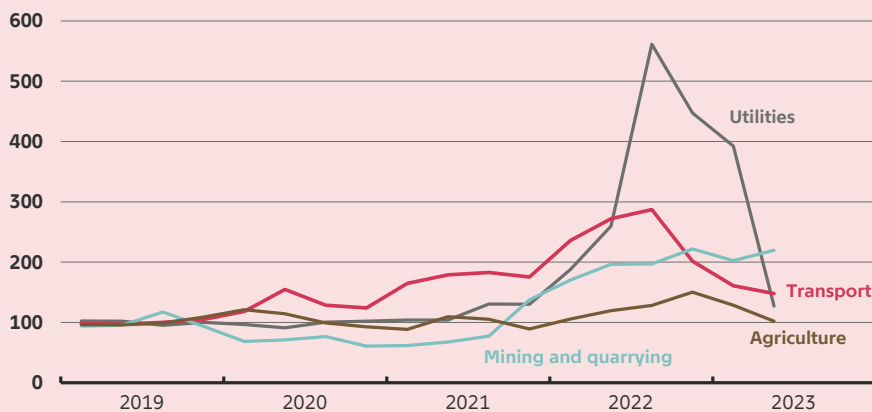
Within sea transport, freight rates also reflect global conditions, and, for Denmark, sea transport accounts for a large part of the total value creation in the transport industry. The reopening of the economies during 2020 put much pressure on capacity in the industry, and as it is not realistic to adapt the fleet of cargo ships to a sharp unexpected increase in demand, this resulted in a heavy increase in freight rates.

For both transport and utilities, the very large increases in the GVA deflator have been partially reversed in 2023, while, for agriculture, the deflator is now even below the level from Q4 2019, see chart 4. The decreases reflect that prices of a wide range of commodities have decreased significantly, just as freight rates are back to pre-pandemic levels. Provided that new unexpected events do not occur, profits in these industries are consequently expected to be at a more moderate level going forward. However, this does not change the fact that some companies in selected industries achieved very high profits during the period with high inflation.

CHART 4

GVA deflator has fallen back totally or partially in transport, utilities and agriculture

Index (2019=100)



Source: Statistics Denmark and own calculations.

Diverse developments in profits in other industries

In the private non-primary sector excl. utilities and transport, the GVA deflator increased by 4.4 per cent from Q4 2019 to Q4 2022, corresponding to an annual rate of increase of 1.4 per cent. However, in the first two quarters of 2023, when overall inflation abated, the deflator increased by 3.1 per cent. There have been large differences across the private non-primary sector. For example, the GVA deflator increased significantly in trade and restaurants, while it decreased in manufacturing industry. The differences may reflect sector-specific supply and demand conditions, differences in production structures and consumption of commodities and other raw materials in production as well as differences in the competitive situation.

The manufacturing industry is an example of an industry in the private non-primary sector in which the GVA deflator has developed weakly. From Q4 2019 to Q4 2022, it decreased by approximately 19 per cent, reflecting approximately equal negative contributions from wages and profits. The decrease in the GVA deflator is unusual in a longer-term perspective. Among other factors, this reflects a weak price development in the pharmaceutical industry, where the GVA deflator fell by 10.0 per cent in 2021 and by 30.7 per cent in 2022.⁵ For the rest of industry, the GVA deflator decreased by 4.8 per cent in 2021 and by 0.5 per cent in 2022. The industry is characterised by energy, commodities and transport, where prices rose markedly, being a significant production input.

In the part of the private non-primary sector that consists of trade and restaurants etc., the GVA deflator increased by 29 per cent from Q4 2019 to Q4 2022. Just over half of this increase went to increased profits, while the rest went to wages. The industry covers both retail and wholesale trade as well as hotels and restaurants, and a number of factors may therefore have driven the price

⁵ Figures for the pharmaceutical industry are for 2021 and 2022 and are a special extract of unpublished figures. They are therefore subject to greater uncertainty than published figures (in DataBank etc.).

development. For example, strong demand for hotels and restaurants after the period of lockdowns may have supported the development in consumer prices. This should also be seen in the context of the difficulties that the industry has of increasing its capacity in the short term.

Statistics Denmark assesses that data are currently too uncertain to calculate figures for the development in the deflator broken down by more specific industries than those shown in chart 3. This means that it is not possible to look at, for example, restaurants separately to map the observed increase in greater detail.⁶ Since Q4 2022, there has been a slight decrease in the deflator for trade and restaurants etc. This may reflect that the situation in the industry is normalising in the wake of the lockdowns.

The construction industry has also been characterised by a significant increase in the GVA deflator, which has largely gone to profits. Here high demand for home improvements resulting from the lockdowns may have contributed to an extraordinary development. Housing investments have subsequently declined substantially. In culture and leisure, business services and information and communication, the increase in the GVA deflator has been at a level between the observed development in industry and in trade and restaurants, respectively. However, a more detailed review of the individual industries is beyond the scope of this analysis.

⁶ It also indicates that uncertainty about the price development is greater than usual, underlining the need to interpret the results of the analysis with caution.

03

The correlation between inflation, profits and corporate market power is not clear cut

Higher profits and higher prices may reflect that companies increase their markups. Markups describe the extent to which companies' sales prices exceed their costs of producing an additional item. See box 3 for an explanation of technical terms and key economic mechanisms discussed in this chapter. An increase in markups may reflect an increase in market power by companies because of weaker competition or that consumers become less responsive to changes in relative prices. An unchanged markup may be interpreted as suggesting that there has been no change in corporate market power. In addition to causing higher inflation, an increase in markups may also lead to a deadweight loss in the economy, i.e. in the form of lower consumption and employment.

Developments in profits can be used as an indicator of whether companies have increased their market power. Other analyses of the development in profits have also been performed for a number of other countries.⁷ This reflects that profits can be computed based on timely quarterly data while the computation of actual markups requires access to data which is often only available with a lag. Developments in profits should however be assessed with caution, as there is no perfect correlation between profits and markups, see, for example, Colonna et al. (2023). Rising profits may reflect an increase in markups, but theoretically, it is not impossible for profits to increase while markups remain constant or even decrease.

⁷ ECB (2023), Arce et al. (2023) and Hansen et al. (2023) analyse the contribution from profits to the GDP deflator for the euro area, while Haskel (2023) looks at the contribution to the GDP deflator for the UK, the United States and the euro area.

BOX 3

Explanation of concepts and key mechanisms

Corporate profits correspond to total revenue less total costs. Revenues are equal to the price multiplied by the quantity sold. Costs are equal to the average cost per unit sold multiplied by the quantity sold. **Marginal costs** describe the costs associated with the production of one additional unit. Marginal costs typically increase as production increases and consequently exceed average costs. This may reflect that a company wishing to increase production must pay a higher hourly wage for overtime work.

Companies will often face a degree of **monopolistic competition**, implying that they have **market power** to set prices. Market power reflects that consumers have preferences for consuming specific products or varieties. If the price of a particular variety goes up, demand for this variety will typically fall but not disappear completely. This is illustrated by a negatively sloping demand curve, see chart A. Under monopolistic competition, companies will set a price that exceeds marginal costs, thereby giving rise to a **markup**. Together, marginal costs and markups form the company's supply curve, which is upward sloping.

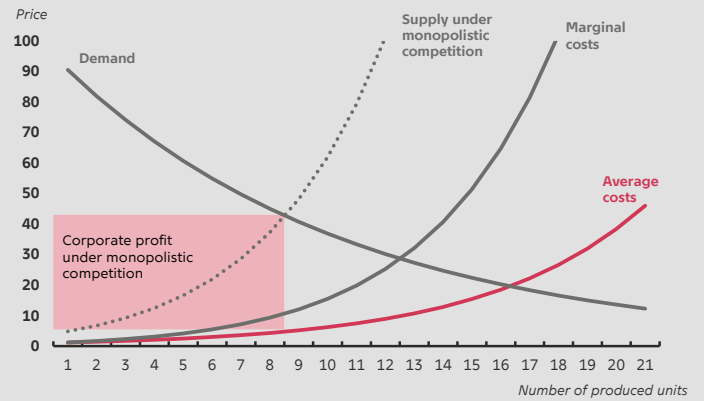
In the following, it is illustrated how changes to supply and demand conditions affect costs, prices, and profits. If marginal costs increase, companies will want to increase prices, see chart B. This leads to a decline in the number of units produced, while profits are also affected. An increase in the costs of materials used in production could be an example of an increase in marginal costs.

An increase in demand will typically also be associated with an increase in marginal costs as production increases. However, as opposed to the example above, this does not reflect a shift in the cost curve. Rather, the demand curve shifts out such that it crosses the cost curve further to the right, where marginal costs are higher. This leads to an increase in prices, while the company also increases its production and profits, see chart C.

The degree of market power affects corporate profits. If companies' market power increases, this will typically lead to an increase in profits. An increase in market power may reflect that consumers become **less price sensitive**, i.e. they become less inclined to substitute away from an expensive variety towards a cheaper alternative even though the price of the expensive variety goes up. A situation where consumers become less price sensitive can be illustrated by a steepening of the demand curve, see chart D. This leads to higher prices and profits.

CHART A

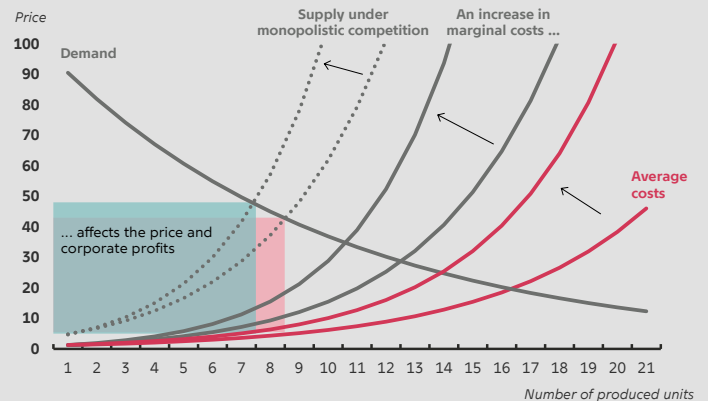
Under monopolistic competition, companies set prices in order to maximise profits



Note: The red area indicates the company's profits under monopolistic competition. The price results from a constant markup over marginal costs.

CHART B

Higher marginal costs lead to higher prices and affect profits



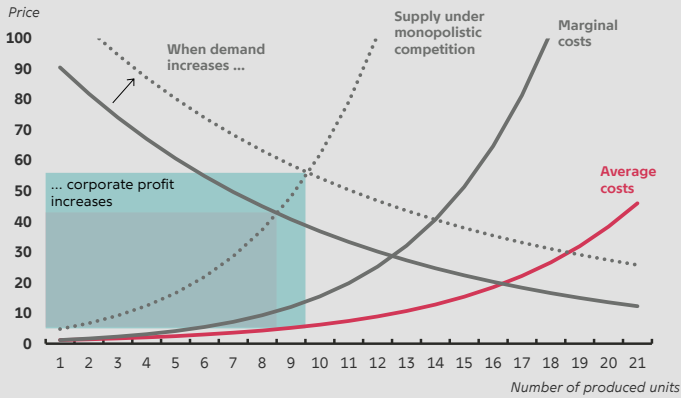
Note: The red area indicates the company's profits before the increase in marginal costs. The green area indicates the company's profits after the increase in marginal costs. Prices in the two states are given by the intersections between the dotted grey lines and the demand curve.

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BOX 3 (continued)

CHART C

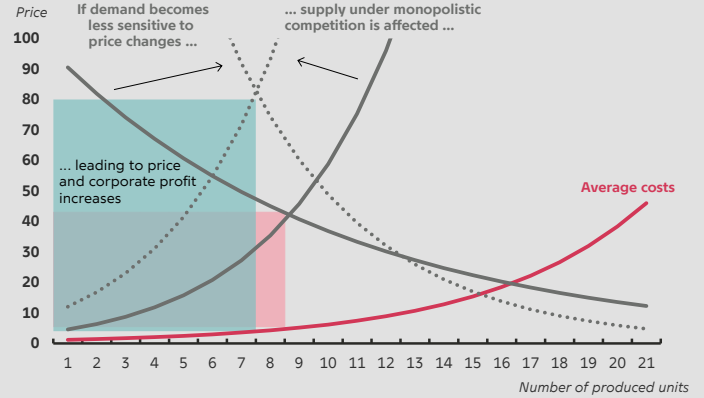
An increase in demand leads to higher prices and higher profits



Note: The red area indicates the company's profits before the increase in demand. The green area indicates the company's profits after the increase in demand.

CHART D

A reduction in the price sensitivity of consumers leads to higher prices and higher profits



Note: The red area indicates the company's profits before the reduction in consumers' price sensitivity. The green area indicates the company's profits after the reduction in consumers' price sensitivity.

Correlation between markups and profits – an illustrative example

To examine more closely the correlation between profits and markups, three examples are reviewed of how they may have developed as a result of an increase in costs of materials. Firstly, a situation with unchanged demand conditions is examined, i.e. how large a consumption households want to have and how they react to changes in prices. This is followed by a discussion of the role played by changes in demand conditions.

The correlation between markups and the different contributions to the GVA deflator is illustrated in chart 5. The left column shows a situation in which it is assumed that a company generates revenue of kr. 200, of which it has costs of materials of kr. 100, resulting in a GVA of kr. 100. Of this, kr. 60 is assumed to go to remuneration of the labour input in production, and the remaining kr. 40 to profits for the company. This gives a markup of 25 per cent, which is calculated as the profit share (kr. 40) of the total costs of materials and labour (kr. 100 + kr. 60).

The analysis then looks at the possible adaptation to a situation where the costs of energy consumption in production increase, for example as a result of higher electricity or fuel prices. Specifically, it is assumed that the (unit) price of materials increases, so that the overall costs of materials increase by kr. 50. In turn, payroll costs are assumed to be unaffected. Other things being equal, the higher costs of materials lead to an increase in the company's average costs. Under some assumptions, the cost of producing one additional unit will increase one-to-one with the average costs.⁸ As the markup indicates the relative difference between the company's sales price and its costs of producing one additional unit, this means that profits in kr. per unit of output increase for an unchanged markup.

⁸ See Colonna et al. (2023).

Based on the increase in production costs, three possible scenarios for how companies react are considered. The three scenarios are illustrated by the three columns to the right of the dotted line in chart 5.

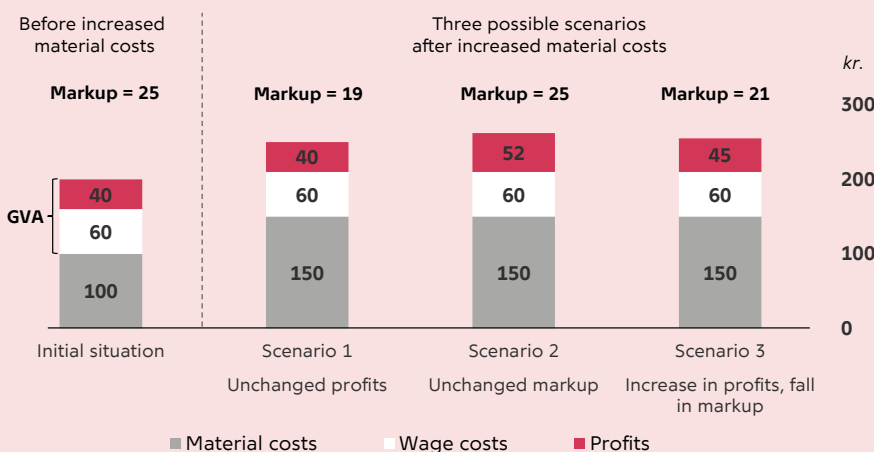
Scenario 1) The company increases its sales price so that profits in kroner per unit of output are unchanged. In this situation, GVA remains unchanged and the total revenue increases to kr. 250, as illustrated in column two. It should be noted that, in this situation, the markup decreases to 19 per cent and that the company’s behaviour thus contributes to alleviating the price pressure from the increased costs. However, a reduction in markup will often not immediately be compatible with unchanged competitive conditions for the companies.

Scenario 2) The company’s markups are kept constant, and the sales price therefore increases due to increased costs. In this situation, the markup is maintained at 25 per cent. However, as the costs on which the markups are based have increased, the profits have also increased and will be kr. 52 in the example shown. GVA thus increases to kr. 112 and the GVA deflator increases by 12 per cent, as illustrated in column 3. The increase in profits leads to inflationary pressure, but this is not due to the companies having gained more market power and having consequently increased their markups.

Scenario 3) The sales price and profits increase, but the company’s markups decrease. There may also be a situation in which the profits increase while the markup decreases. This is illustrated in column 3. In this scenario, the profits increase to kr. 45, and the GVA deflator increases by 5 per cent, but the markup decreases to 21 per cent. The decrease in markups contribute to dampening the inflationary pressure, despite rising profits. A decrease in markups may be due to a sluggish pass-through from increased production costs, but, in the long term, the markup is expected to decrease to 25 per cent subject to unchanged competitive and demand conditions.

CHART 5

Profits may well increase, while markups fall and the company’s behaviour dampens the inflationary pressure



Demand also plays a role in prices and markups

A number of studies have emphasised that high inflation during 2021-2022 was not only driven by increased costs of materials for production, but also by

increased demand to a great extent.⁹ The demand reflects both the level of consumption households want to have and how they react to changes in prices. Both factors may have played a role in the rise in inflation. However, their impact on corporate profits and markups as well as on the pass-through from increased costs to prices differ.

In a situation where consumers will be less inclined to reduce their consumption or switch to the goods and services of a competing company, despite rising prices, the market power of the companies will increase. Companies will therefore be able to increase their profits and markups. In relation to the examples in chart 5, this also means that the pass-through from increased costs to prices will be higher under higher markups, other things being equal.

The situation is different when the households want to increase their overall consumption, but maintain their reaction to price changes. When the reaction to price changes does not change, the market power of the companies and thus their markups do not change either. However, the increased demand results in companies increasing their production, which will often lead to increased costs for the last product produced. This leads to higher prices, even though markups remain unchanged. Increased costs associated with producing the marginal unit may reflect that additional production puts increased pressure on the companies' capital stock. In addition, capacity constraints may make it difficult to increase production, implying that costs rise strongly. This means that an increase in demand may lead to an increase in prices and inflation, thereby affecting corporate profits, even if markups are unaffected.

Restoration of income distribution may resemble a temporary wage-price spiral

The above illustrative example, where the increase in costs of materials increases profits for maintained markups, entails that the wage share, i.e. the labour share of GVA, decreases. The wage share generally depends on a number of factors, including the structures of the labour market and the bargaining position of employees. Provided that these conditions have not changed, it is therefore conceivable that the distribution of GVA between wages and profits will return to the point of departure, so that the decrease in the wage share is restored. For maintained markups, the restoration of the wage share entails further price increases, and the dynamics may resemble a temporary wage-price spiral.

In the example in chart 5, where the company's behaviour pattern does not change and where the markup is therefore kept at 25 per cent, the increased costs of materials result in an increase in profits to kr. 52. With unchanged payroll costs, this means that the wage share in GVA decreases from 60 to 54 per cent, see column two in chart 6. The employees can now try to recoup their share of the income. To achieve a wage share of 60 per cent in a situation where profits are kr. 52, this requires that the wage increases to kr. 78, as illustrated in column 3. However, the wage increase causes the company's costs to rise. With a maintained markup, the price is therefore increased and profits again increase, now to kr. 57. The new increase in profits subsequently means that the employees must again try to obtain a wage increase to recoup the wage share of 60 per cent. With profits of kr. 57, this requires a wage increase to kr. 86, as shown in column 4.

The process of wage and price increases can continue until a new equilibrium is found, in which the wage share is restored and the markup remains unchanged. The new equilibrium is illustrated in column 5. Here, employees and business owners share the income in exactly the same way as before the increase in costs of materials (column 1). However, the increase in costs of materials has not only caused the sales price to increase by kr. 50, but by kr. 100. The extra kr. 50

⁹ See, for example, Harr and Spange (2023) and the references there.

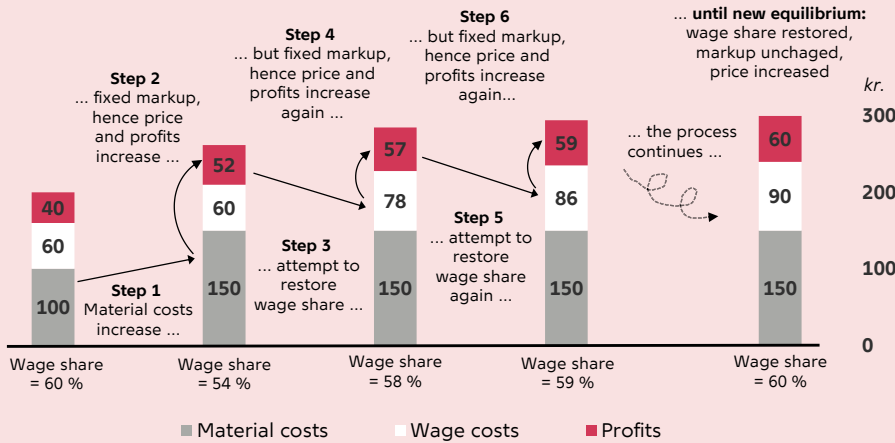
reflects a monopolistically competitive situation in which the business owners receive a share of the profits from production, in combination with an income distribution conflict, in which the employees maintain their share.¹⁰ However, while the adjustment may resemble a temporary wage-price spiral, a genuine spiral can only occur if there is a shift in long-term inflation expectations among households and companies.

Demand conditions also play a role in the adjustment to the new equilibrium. Where consumers have become less inclined to reduce their consumption or switch to the goods and services of a competing company in reaction to increased prices, markups may increase in the long term. This leads to an increase in corporate market power, and thus to an increase in the profit share of GVA. However, if the increased demand during 2021-2022 does not reflect a changed reaction to price changes, but only higher desired consumption, this will generally not change the income distribution in the long term.

How fast the economy adjusts to the new equilibrium depends on how quickly prices and wages react.¹¹ The price reaction may reflect the size of the shock, as there are indications that companies typically change prices more frequently in the event of large shocks.¹² The wage reaction depends to a large extent on the structures of the labour market.

CHART 6

The increase in costs of materials may trigger a chain reaction in which price and wage are increased until the wage share has been restored and the markup remains unchanged



¹⁰ See Lorenzoni and Werning (2023a) for a discussion of the importance of income distribution conflict to the price development, and Lorenzoni and Werning (2023b) for an elaboration on how this is connected with wage-price spirals.

¹¹ See Hansen and Jensen (2023) for an analysis of how wage increases are expected to affect inflation in the coming years.

¹² See, for example, Bobeica et al. (2019).

International studies of markups do not give a clear-cut picture

The approach adopted in this analysis does not make it possible to determine to what extent scenarios 1, 2 and 3 have been dominant in the individual industries since 2019. Based on up-to-date company data, international studies have analysed the development in markups and found mixed results.¹³

For Germany, Italy and Australia, these international studies find that markups do not seem to explain the higher inflation in general, when excluding global industries such as mining and quarrying. However, there are indications that corporate behaviour in specific industries where competition is less global may have contributed to increasing inflation. For the United States, there is conversely evidence that rising markups contributed significantly to the increase in inflation in 2020-2021. However, there are also indications that the increased US markups reflected, to some extent, that companies were raising their prices in anticipation of rising future costs rather than weakened competition.

Stable distribution between wages and profits going forward

From 2021 to 2022, the profit share of GVA for the economy as a whole increased and was around 43 per cent in Q3 2022.¹⁴ However, the profit share has subsequently decreased to approximately 37 per cent, which is approximately equal to the pre-pandemic level, see chart 7. The development largely reflects the global industries, where there have been heavy fluctuations in profits in recent years. For the private non-primary sector excl. utilities and transport, the shares going to profits and wages, respectively, have developed in a more stable manner.

The future development will depend on a number of factors, including the development in markups. A number of international studies document that corporate market power has increased over the past several decades, while the wage share has decreased across countries.¹⁵ For Denmark, the Danish Economic Councils (2022) find an increase in companies' markups from 2000 to 2018. However, Pedersen et al. (2019) find that the wage share has not decreased in Denmark in the same way as in other countries when adjusted for Danish companies' trading and production abroad.

Danmarks Nationalbank forecasts that the wage and profit share of GVA will stabilise around the historical levels in 2023-2025. The forecast reflects a number of assumptions, including that wages are expected to increase and that companies' profits in special industries such as mining and quarrying as well as utilities, where they have increased significantly, are expected to fall. The reversal has already occurred to a significant extent, for example in the utilities sector, where profits have fallen significantly in Q2 2023.

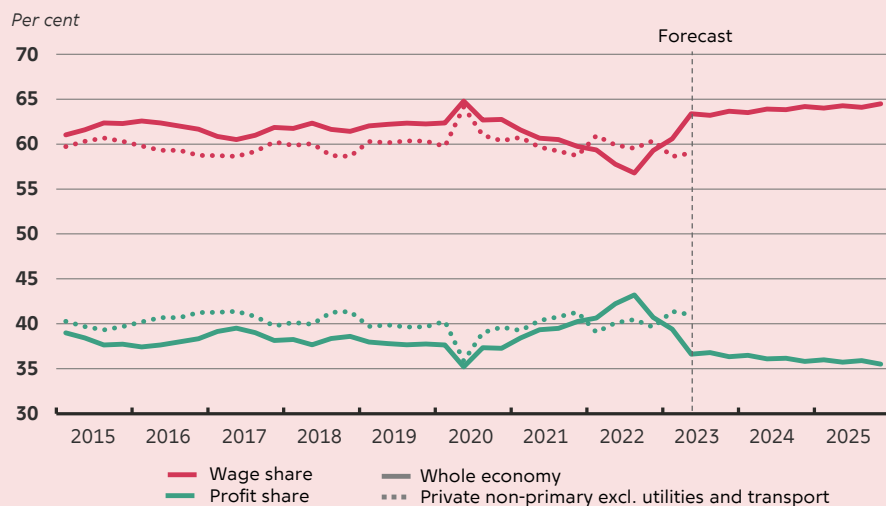
¹³ See Colonna et al. (2023), Reserve Bank of Australia (2023) and Glover et al. (2023).

¹⁴ In this context, GVA excludes merchanting and processing.

¹⁵ See, for example, IMF (2019).

CHART 7

Profits as a share of GVA is at pre-pandemic level



Note: Profits also include taxes. Gross value added is excl. of trading and processing abroad. There is no projection for the private non-primary sector excl. utilities and transport.

Source: Statistics Denmark and own calculations.

Bibliography

Arce, Oscar, Elke Hahn and Gerrit Koester (2023), How tit-for-tat inflation can make everyone poorer, *The ECB blog*, March.

Bobeica, Elena, Matteo Ciccarelli and Isabel Vansteenkiste (2019), The link between labor cost and price inflation in the euro area, *ECB Working Paper*, no. 2235.

Colonna, Fabrizio, Roberto Torrini and Eliana Viviano (2023), The Profit Share and Firm Mark-Up: How To Interpret Them?, *Questioni di Economia e Finanza (Occasional Papers)*, no. 770, May.

The Danish Economic Councils (2023), Trends in market power of Danish firms, *Productivity*, chapter III.

ECB (2023), How have unit profits contributed to the recent strengthening of euro area domestic price pressures?, *ECB Economic Bulletin*, no. 4, box 3.

Glover, Andrew, José Mustre-del-Río and Alice Ende-Becker (2023), How Much Have Record Corporate Profits Contributed to Recent Inflation?, Federal Reserve Bank of Kansas City, Economic Review, First Quarter 2023.

Hansen, Niels-Jakob, Frederik Toscani and Jing Zhou (2023), Euro Area Inflation after the Pandemic and Energy Shock: Import Prices, Profits and Wages, *IMF Working Papers*, no. 2023/131, 23 June.

Hansen, Nicolaj Mose Dreisig and Rasmus Mose Jensen (2023), Pay increases extend high core inflation period, *Danmarks Nationalbank Analysis*, no. 11, September.

Harr, Thomas and Morten Spange (2023), Inflation – why did it rise and what are the drivers ahead?, *Danmarks Nationalbank Economic Memo*, no. 3, February.

Haskel, Jonathan (2023), *What's driving inflation: wages, profits or energy prices?*, speech given at the Peterson Institute for International Economics, Washington DC, May.

IMF (2019), The Rise of Corporate Market Power and Its Macroeconomic Effects, *World Economic Outlook*, April, chapter 3.

Känzig, Diego R. (2021), The Macroeconomic Effects of Oil Supply News: Evidence from OPEC Announcements, *American Economic Review*, 111 (4).

Lagarde, Christine (2023), The path ahead, speech at the conference 'The ECB and Its Watchers XXII', March.

Lorenzoni, Guido and Iván Werning (2023a), Inflation Is Conflict, *NBER Working Paper*, no. w31099, June.

Lorenzoni, Guido and Iván Werning (2023b), Wage Price Spirals, *Technical Report*.

Pedersen, Erik Haller, Adrian Michael Bay Schmith and Rasmus Rold Sørensen (2019), Globalisation affects measures of wage competitiveness, *Danmarks Nationalbank Analysis*, no. 27, December.

Reserve Bank of Australia (2023), Have Business Profits Contributed to Inflation, Box B in *Statement on Monetary Policy*, May.

Schnabel, Isabel (2022), *The globalization of inflation*, speech at a conference organised by Österreichische Vereinigung für Finanzanalyse und Asset Management, May.

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