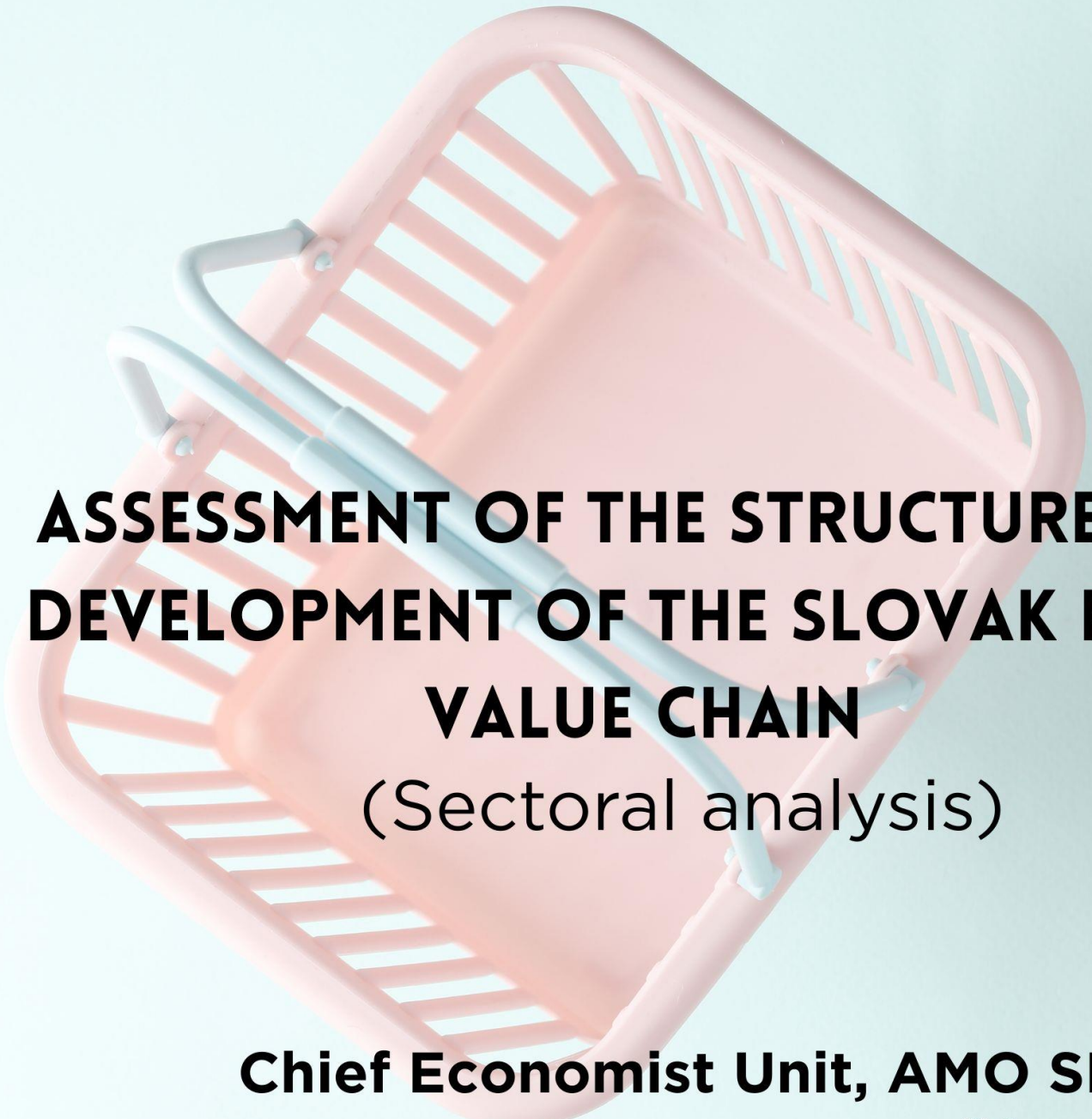




ANTIMONOPOLY
OFFICE
OF THE SLOVAK
REPUBLIC



ASSESSMENT OF THE STRUCTURE AND DEVELOPMENT OF THE SLOVAK FOOD VALUE CHAIN

(Sectoral analysis)

Chief Economist Unit, AMO SR

Author: Richard STANČÍK

20 October 2025



Contents

Summary.....	6
Introduction	8
1 Current economic development	13
1.1 Food consumption	17
1.2 Food price level.....	20
2 International position of the slovak food vertical	27
2.1 Sectoral concentration.....	29
2.2 Investments and subsidies.....	36
2.3 Inputs to production.....	42
2.4 Value added and labor productivity	49
2.5 Production capacity and foreign trade	57
3 Sectoral analysis of the slovak food vertical	64
3.1 Market concentration.....	69
3.2 Margins and profitability	91
3.3 Productivity and labour costs.....	101
Conclusion.....	113
References.....	115
Annexes	119

List of figures, tables, and boxes

Figure 1 - Food prices in Slovakia grew faster than inflation and the EU food prices...	14
Figure 2 - Slovakia recorded the highest increase in household food consumption in the region	17
Figure 3 - Slovak households spend more on food and catering than the EU average, the share is rising further.....	18
Figure 4 - Food poverty affects nearly fifth of slovak households, worsened by rising prices.....	19
Figure 5 - EU food prices are leveling off, but price levels become misaligned with purchasing parity of less developed economies	21
Figure 6 – Data revision places Slovakia as the cheapest food market among its region	22
Figure 7 - Domestic production is more expensive than imports, which dampening overall food inflation	23
Figure 8 - All food categories drove inflation during its peak, with Hungary showing the strongest rise.....	24
Figure 9 - Slovaks prefer processed foods, with low seasonal food consumption compare to majority of EU states	25
Figure 10 - Higher energy costs have pushed processed food prices up	25
Figure 11 - Slovak agri-commodity prices have outpaced the EU average since 2020	28
Figure 12 - Market share of Slovakia's top 10 food firms matches the EU average	30
Figure 13 - Low investment rates in food sectors fail to reduce investment debt	37
Figure 14 - Government subsidies to agriculture remain inefficient.....	39
Figure 15 - Slovak farmers struggle with ineffective use of government subsidies.....	40
Figure 16 - Government support for research and development reveals competitiveness gaps among european farmers	40
Figure 17 - Agricultural input prices in Slovakia rose faster than in majority of EU countries	42
Figure 18 - Slovak companies face among the highest energy prices in the EU	43
Figure 19 - Input intensity has risen across food sectors, mainly due to highest energy consumption within the region	45
Figure 20 - Input productivity in slovak food sectors is stagnating or declining	46
Figure 21 - The share of renewables in food sectors has decreased.....	48
Figure 22 - Slovakia's food waste level reflects EU average	48
Figure 23 - During the inflation peak, european competitors mostly achieved higher margins than slovak producers.....	51
Figure 24 - Employee compensation in agriculture is high, manufacturing seems to follow the same trend.....	53
Figure 25 - Weak labor productivity limits rise of value added in food sectors.....	55
Figure 26 - Slovakia's trade deficit deepens, mostly driven by fruit, vegetables and meat imports	58
Figure 27 – Food import dependence is rising in Slovakia, but self-sufficiency declining across the region.....	59
Figure 28 - Weak export performance highlights low competitiveness of slovak producers	60

Figure 29 - Slovakia's food market remains relatively closed compared to its size	61
Figure 30 - Food production capacity cannot meet domestic household demand ..	62
Figure 31 – Inflation drove record sales growth, strongest in manufacturing	65
Figure 32 – Retail trade shows steady growth, while other sectors remain vulnerable to shocks.....	66
Figure 33 - Market concentration is rising slightly, with challenges in manufacturing ..	71
Figure 34 - Agriculture and trade remain competitive, but manufacturing is dominated by large firms	77
Figure 35 - New firms mostly entered in manufacturing, while wholesale market has consolidated	80
Table B6_1 – Changes in Concentration Index by adjustment for imports	86
Figure B6_1 – Imports reduce concentration, reflecting strong foreign penetration ...	87
Figure B7_1 – Regional concentration index based on company headquarters location.....	89
Figure 36 - Retailers did not benefit from the sharp rise in prices, while processors managed to more than double their profitability	94
Figure 37 - Profit margins grew mainly in large firms, while profitability among small firms has been lagging behind	96
Figure 38 – Large firms pay higher wages due to stronger productivity growth.....	103
Figure 39 - Labor productivity is highest within market leaders, while mixed trends has been recorded elsewhere	106
Figure 40 - Productivity gaps between large and small firms are narrowing, but still remain quite wide	108
Figure 41 - Capital intensity is falling, investment expenditure lagging behind wage growth	111
Table 1 - Overview and development of the Concentration Index (HHI) in slovak food sectors.....	73
Table B6_1 – Changes in Concentration Index by adjustment for imports	86
Table B7_1 – Regional Concentration Index for year 2023 - wages paid approach ...	89
Table B7_2 – Regional Concentration Index for year 2023 - employee location approach	90
Box 1 – Competition trends in food retail and their impact on consumer prices	11
Box 2 – Effects of political interventions on excessive price increases	15
Box 3 – Methodological changes behind the sudden drop of food price level	26
Box 4 – Definition of concentration indicators	33
Box 5 – Methodological challenges in measuring market concentration	81
Box 6 – Foreign competition as a driver of concentration changes	83
Box 7 – Regional concentration in „Manufacture of bread and pastrygoods“ segment	88
Box 8 – Do rising margins drive food price growth? Evidence and insights	99

Announcement

Economic and sectoral studies constitute an important analytical instrument for competition authorities, enabling them to identify and assess potential issues within a given sector, independently of merger control procedures or investigations into anti-competitive conduct. These studies also provide comprehensive evaluations of market and industry structures as well as the prevailing competitive conditions within the sector concerned.

Such studies are a key tool for strengthening the knowledge base of competition authorities in relation to specific industries, while at the same time forming a valuable component of their broader investigative activities. They may also be carried out in the context of a sector inquiry, however, their focus should not be on the examination of conduct infringing competition law. In addition, they may serve as a basis for the adoption of measures aimed at enhancing consumer awareness, initiating competition law enforcement proceedings, or introducing regulatory interventions, depending on the mandate of the authority in question.

The objective of publishing sectoral and economic studies is to foster and enrich expert debate on competition policy in Slovakia, rather than to evaluate conduct that infringes competition rules. The publication has been prepared in line with OECD standards, which provide a methodological framework for analytical units in formulating recommendations addressed to policymakers across different levels of public administration.¹

¹ OECD (2018). „Market Studies Guide for Competition Authorities“.

Summary

The slovak agri-food sector experienced a significant increase in food prices during the period 2021–2024, primarily driven by external factors such as rising input costs, production shocks, disruptions to global supply chains, and higher energy prices. **The energy intensity of production in Slovakia is relatively high compared to neighbouring countries**, as the entire food production chain relies heavily on intermediate consumption of energy inputs. **This structural feature increases the vulnerability of slovak producers to supply shocks and sudden rises in production costs**, while at the same time constraining value-added generation and weakening the competitiveness of domestic producers.

Cumulative food price inflation in Slovakia reached 42% between 2020 and 2023, resulting in a loss of competitiveness of domestic production. Moreover, **the price level of slovak food products exceeded that of imported goods by 8 percentage points, contributing to increased demand for imported food products**. Negative trends in **international trade** in agri-food goods indicate Slovakia's growing dependence on imports, as **reflected in the doubling of the trade deficit in food production between 2010 and 2022**.

Domestic production currently covers only 87% of household consumption, positioning Slovakia among the EU countries with lower production capacity and a higher reliance on imported agri-food products. Small production volumes and a limited supply of higher value-added products prevent slovak firms from achieving economies of scale, resulting in higher unit production costs and weaker price competitiveness vis-à-vis foreign suppliers. This situation also limits the potential for export expansion.

The effectiveness of state subsidies in agriculture remains problematic, as financial support is frequently allocated without sufficient regard to innovation potential or production sustainability. Comparative evidence across EU countries suggests that up to **40% of subsidies in the sector fail to generate direct economic benefits when measured against European averages**. This points to systemic shortcomings in the allocation of public resources. Insufficiently targeted support undermines the competitiveness of slovak producers, who face limited access to modern technologies and use production factors less efficiently.

Labour productivity in the slovak food industry has long lagged behind European benchmarks. None of the slovak subsectors reach the EU average level of labour productivity. The main reasons include underinvestment in the modernisation of production processes, a low degree of automation, and weak uptake of digital technologies. This inefficiency raises labour costs, reduces profit margins, and limits the creation of value added.

During the peak of food price growth, concerns were raised that price increases were driven by higher profit margins, potentially signalling a failure of competition. However, **economic analyses of the slovak economy did not produce conclusive evidence of widespread abuse of market power**. Retailers have maintained a stable gross margin

share over the past decade, and no disproportionate increase was observed during the inflationary period. This suggests that the sector was able to optimise costs and partly absorb inflationary pressures. **Margin developments confirm that inflation was primarily the result of external drivers**, namely higher prices of raw materials, energy, and logistics. **No systematic evidence of anti-competitive conduct has been identified.**

Profit margins in the services segment of the slovak agri-food chain grew at a slower pace compared to primary production and food processing, indicating that retail chains did not disproportionately benefit from inflation. On the contrary, they appear to have contributed to a partial moderation of price increases. The sharp rise in food prices in 2022 and 2023, however, enabled significant profit growth in the lower parts of the value chain. In 2022, profitability was strongest in agriculture, while in 2023 the food processing sector recorded a marked improvement in profit performance.

An analysis of margins by market share indicates that smaller firms generate lower profitability despite comparable gross margin levels, likely due to higher labour intensity per unit of output. By contrast, market leaders benefit from economies of scale, thereby securing a competitive advantage. **Significant differences in capital endowment constrain the development of smaller enterprises**, particularly in food processing and retail, weakening their competitiveness and contributing to a redistribution of market shares in favour of larger firms.

Although the increase in market concentration in the slovak agri-food sector has been relatively gradual and remains within low concentration thresholds, certain segments of the food processing industry display higher susceptibility to weaker competition intensity. Nevertheless, in most parts of the agri-food value chain no significant concerns regarding restricted competition have been identified. **Available evidence does not point to systemic competition failures in the slovak agri-food sector.** Instead, the main factors driving inflation in recent years were rising commodity, energy, and logistics costs.

The structural challenges facing the slovak agri-food sector are frequently misinterpreted as a consequence of insufficient competition. Such a simplified view overlooks the complexity of the sector's difficulties. While competition is an important factor, it is not the principal driver of the sharp food price increases observed in recent years. **The agri-food sector suffers from serious structural weaknesses, in particular low productivity, underinvestment in modernisation, and inefficient allocation of public support. These shortcomings determine the sector's overall production capacity and its ability to generate value added.** Without substantial reforms, the sector will remain vulnerable to global economic shocks, which could further erode its competitiveness and undermine the country's food self-sufficiency.

Introduction

The food supply chain described in this analysis encompasses food production and logistics, beginning with farm-level production and on-farm sales, followed by processing, and culminating in retail sales of both unprocessed and processed food products. Each of these stages involves contractual arrangements or transactions between actors in the chain and thus represents potential points where competition problems or distortions may arise. **Understanding the functioning of competition along the agri-food value chain is of particular importance, as price changes at one stage (e.g. fertilisers) are transmitted to subsequent stages**, ultimately affecting final consumer prices. Market failures and competition distortions may therefore be among the factors influencing price developments within the food chain.

A typical competition concern in this sector relates to the structurally weaker bargaining position of farmers vis-à-vis other participants in the chain, such as processors and retailers. This weaker position may result in farmers receiving lower prices for their products than would prevail in a more competitive market. Moreover, international evidence suggests that weak bargaining power can force farmers to accept commercial practices considered unfair, such as disadvantageous payment terms or contractual conditions.²

However, **food price developments are not driven solely by competition dynamics, making it essential to also assess the potential role of broader economic factors**. For analytical clarity, the market characteristics shaping final prices can be grouped into two broad categories: competition-related factors and economic factors. Key competition-related factors include:

- **Market shares and concentration indices:** economic theory indicates that **higher concentration**, i.e. fewer market participants, **often results in higher prices, as firms gain stronger incentives to raise them**. This relationship is well-established in many economic models.³ However, the link is not always straightforward: if the largest firm is also the most efficient and reduces prices to expand its market share, concentration may increase while prices decline. In such cases, the relationship between concentration and prices may be inverse. **According to the well-known Structure–Conduct–Performance (SCP) paradigm, market structure (S) is a key determinant of firm conduct (C) and, ultimately, market performance (P), including production, prices, and investment**. Market structure is therefore central to understanding how competition functions in any given context;⁴

² Agricultural Markets Task Force (2016). „Improving market outcomes: Enhancing the position of farmers in the supply chain“.

³ European Commission (2024). „Protecting competition in a changing world - Evidence on the evolution of competition in the EU during the past 25 years“.

⁴ European Commission (2024). „Protecting competition in a changing world - Evidence on the evolution of competition in the EU during the past 25 years“.

-
- **Asymmetric bargaining power:** differences in firm size and negotiating capacity lead to imbalanced contractual relationships, influencing quantities supplied and price levels;
 - **Health and safety requirements:** regulatory standards can restrict access for foreign suppliers to established markets and thereby affect market concentration and competitive intensity;
 - **Exemptions from competition law:** agriculture frequently benefits from selective exemptions from antitrust rules, such as cooperative marketing or geographically protected designations of origin. Within the EU, Article 42 of the Treaty on the Functioning of the European Union empowers the legislator to determine the extent to which competition law applies to this sector, while taking into account the objectives of the Common Agricultural Policy (CAP). These include raising agricultural productivity, ensuring a fair standard of living for agricultural communities, stabilising markets, securing supplies, and ensuring reasonable consumer prices⁵;
 - **Price transmission:** refers to the extent to which changes in agricultural producer prices are reflected in consumer prices, and vice versa. A low degree of price transmission is often interpreted as an indicator of imperfect competition. Some empirical findings suggest that price transmission tends to be weaker in occurrence or abuse of market power.

For an accurate assessment of the relationship between price developments and market structure, **it is also necessary to control for sector-specific differences, such as cost structures, demand conditions, or regulatory factors. If these are not taken into account, the observed link between competition and prices may be misleading,** reflecting a combination of influences rather than a genuine causal effect. **These other determinants of price formation are hereafter referred to as economic factors,** including:

- **Firm productivity and cost structures:** determining the capacity to respond flexibly to price shocks. Higher productivity enables firms to optimise resource use, reduce unit costs, and offer more competitive prices;
- **Investments:** enhances efficiency in the use of labour and raw materials, thereby reducing costs and increasing output. Firms investing in new technologies are better able to cope with inflationary pressures and sustain favourable consumer prices;
- **International trade:** presence of foreign firms increases competition, exerts downward pressure on prices, and encourages domestic firms to improve productivity and efficiency. Specialisation and international division of labour facilitate more efficient resource allocation, leading to broader product variety, lower prices, and higher consumer welfare;
- **Commodity price developments on international markets:** climate change and global events, such as economic crises, pandemics, wars, or shifts in major economies' trade policies, can cause sharp fluctuations in commodity prices.

⁵ OECD (2024). „Competition in the Food Supply Chain“.

These affect production volumes and primary producers' incomes, as well as processors' costs and final consumer prices;

- **Government regulation:** encompassing financial support (e.g. subsidies) and trade barriers. The food chain is strongly shaped by government intervention, ranging from direct financial support to the imposition of trade restrictions;
- **Instability in product quality:** many food products are perishable, requiring specialised storage and complex logistics;
- **Long production cycles and rigid planning:** decisions on crop planting or livestock rearing are made far in advance, resulting in relatively inelastic supply at the time of harvest and sale;
- **High exposure to external factors:** agricultural production is heavily dependent on weather and water availability, both unpredictable factors with major impacts on output;
- **Inelastic demand:** as food is an essential good, supply restrictions or price fluctuations carry significant social and political implications;
- **High fixed production costs:** inputs such as seeds, fertilisers, and pesticides constitute largely fixed costs, while output (harvest) remains variable and subject to external shocks.

In the context of severe economic shocks, marked structural changes, or significant price volatility, it is therefore crucial to identify which factors, competitive or economic, play the dominant role in shaping outcomes. Based on these considerations, the food sectors can be characterised as specific in nature, with structural features that ultimately influence product quality, quantity, and prices, thereby directly affecting affordability for consumers. **Strengthening competition** in the agri-food value chain **could deliver significant benefits for the sector**, improving affordability, efficiency, and overall food system performance (see Box 1). However, sectoral competitiveness and effective competition also depend critically on the availability and cost of inputs.

The analysis highlights the competition-related and economic specificities of the slovak food sectors and maps their interlinkages. **This issue is particularly relevant given the sharp increase in food prices, which reached double-digit levels between 2021 and 2023, exceeding historical peaks.** These developments underscore the need for a deeper examination of structural factors and their impact on price formation, competition, and sectoral competitiveness. **Disruptions to supply, alongside rising input costs, including labour availability, may have substantial implications for consumer welfare⁶.**

The following sections of the analysis examine recent macroeconomic developments, with a particular focus on rising food prices and shifts in consumption patterns in Slovakia. An international comparison of slovak food sectors is then presented, assessing key economic performance indicators from a macroeconomic perspective. This includes an evaluation of sectoral concentration, productivity levels, input structures, value-added creation, production capacity, investment intensity, public

⁶ McCorriston, S. – Morgan, C. – Rayner, A. (1998). "Processing technology, market power and price transmission".

support, and the state of foreign trade. These factors are critical for assessing the competitiveness of the slovak food sector relative to other EU countries.

Subsequent sections devote special attention to the slovak food value chain. The analysis explores in detail the relationship between concentration and price formation, as well as the influence of sectoral structures and other economic factors on margins and profitability. It further evaluates how productivity and cost efficiency affect firms' overall economic performance. This comprehensive perspective provides a deeper understanding of the structural challenges and opportunities facing the slovak agri-food sector, which may prove decisive for its future development and its ability to withstand growing competitive pressures.

Box 1 – Competition trends in food retail and their impact on consumer prices

Effective competition in the food sector plays a crucial role in shaping living standards, the affordability of essential goods, and consumer welfare. For example, an analysis by Lear et al. (2024) examines the relationship between market concentration and prices in the grocery retail sector across a sample of five European countries (Belgium, Denmark, France, Germany, and Poland) as well as the United States. The study focuses on the prices of staple goods in order to minimise cross-country differences in consumer behaviour. **The results suggest that in countries with higher levels of concentration, the prices of basic food products are higher⁷.** This is primarily due to the relatively inelastic nature of supply and demand for food, as it constitutes an essential good with limited price sensitivity. Price transmission is also relevant in this context, since a low degree of price pass-through is often interpreted as an indicator of a non-competitive environment, but it is likewise characteristic of relatively inelastic goods.

Another study on trends in modern retail (European Commission, 2014) finds that **concentration among retailers has increased⁸.** The sector could consolidate further in order to ensure both quality and supply volumes, while simultaneously reducing the number of intermediaries. **A notable development among large independent retailers is the growing tendency to establish linkages with wholesale or commodity suppliers, often through trade cooperatives that represent their businesses and interests.** In the slovak context, the largest companies operating in the retail sector are grouped within the SAMO alliance. Abroad, retail cooperatives have faced two main challenges in the past decade. In particular, the necessity to reduce costs and the need to exercise greater control over the production process of final food products in response to heightened consumer demands. This has in some cases led to vertical integration, whereby retail cooperatives integrate actors across the entire value chain in order to secure full control over processes and contractual arrangements.

⁷ Lear et al. (2024). „Exploring aspects of the state of competition in the EU: Final report“.

⁸ European Commission (2014). „The economic impact of modern retail on choice and innovation in the EU food sector“.

Increasing concentration has also been observed in the area of procurement, through the development of retail alliances. These groups operate at regional, national, or international levels and are established by several retailers with the aim of improving purchasing conditions and strengthening their competitiveness vis-à-vis other players in the retail sector. According to recent analysis, **the average value of the Herfindahl-Hirschman Index (HHI) in the grocery retail sector across EU Member States stood at 1,245 in 2018.** Highly concentrated markets (HHI > 2000) were observed in Finland, Norway, and Sweden, whereas in 44% of EEA Member States the HHI remained below 1,000, indicating highly competitive sectors. **Nonetheless, in 82% of EU Member States, both CR4 and HHI values increased between 2009 and 2018.**⁹

In the European context, retail groups in the food sector have become increasingly internationalised over the past two decades. While this may today appear self-evident, internationalisation is in fact a relatively recent phenomenon in the retail sector, which remains more deeply embedded in national economies than many other industries. Even among the most internationalised grocery retailers, only a small number derive more than 50% of their turnover from foreign markets. This process of internationalisation has been driven by several factors. **As retail markets in more developed Member States have reached maturity and growth has stabilised, retailers have increasingly sought expansion abroad, transferring their business models to countries with greater sales growth potential.** The enlargement of the EU and the creation of the Single Market facilitated this expansion by opening new markets to Western European retailers. **These new markets typically offered stronger economic growth and historically lower levels of competition.** In particular, the new Member States of Central and Eastern Europe have, over the past decade, become key destinations for the expansion of Western European retail groups. As a result, **modern retail has developed rapidly in Slovakia as well, contributing to intensified competition in the grocery retail segment.**¹⁰

⁹ Van Dam et al. (2021). „A detailed mapping of the food industry in the European single market: similarities and differences in market structure across countries and sectors“.

¹⁰ Institute for Strategies and Analysis of the Slovak republic(2024). „Maloobchodné refazce na predaji tovarov a potravín v roku 2022 nebohatli“.

1 Current economic development

Periods of high inflation, and in particular food inflation, place increased emphasis on the functioning of economic relationships within the agri-food supply chain. Food constitutes an essential good, and rising food prices have a particularly severe impact on low-income households, which allocate a disproportionately large share of their expenditure to food. Consequently, **food prices affect not only the consumption of food itself but also the overall purchasing power of households.** In this context, the role of competition and well-functioning markets in maintaining affordable food prices is of critical importance, especially during periods of elevated inflation. This situation simultaneously presents a challenge for policymakers, who must ensure the proper functioning of markets and the stability of the supply chain.

Between 2020 and 2024, many advanced economies experienced high rates of food price inflation, which in November 2022 exceeded 14% year-on-year.¹¹ In general, a variety of factors may contribute to such extreme price developments, including rising input costs, poor harvests, breaches of international agreements, wars, physical or regulatory barriers, and even episodes of panic or price crises, as observed during the food price crisis of 2007–2011.¹² According to an analysis conducted by the Ministry of Finance of the Slovak Republic, **the primary driver of high inflation in Slovakia during 2021 and 2022 was the increase in input costs, which were passed through to consumer prices.** Price growth in this period largely reflected higher **production costs, while the contribution of increased profit margins was minimal. Rising input prices in food production were only partially transmitted to consumers, as short-term price volatility was partly absorbed by the manufacturing sector.**¹³ Evidence from food processors suggests that the industry is often compelled to absorb such shocks, given consumers' high price sensitivity.¹⁴ From the second half of 2022, however, when inflation peaked, **increased profits also began to play a significant role, particularly in the agricultural sector,** due to external shocks arising from the war in Ukraine, which drove global agricultural commodity prices sharply upward. **Subsequently, higher profitability was also observed in the food processing sector.**

A comparison with neighbouring countries reveals notable differences between food price growth and overall inflation. In Slovakia, food inflation reached slightly higher levels than in the Czech Republic and Poland, but remained below the levels recorded in Hungary. The year-on-year rate of overall inflation in Slovakia peaked at around 15% in early 2023, compared to 28% for food inflation.¹⁵ Since 2020, food inflation has outpaced overall price growth in all neighbouring countries except the Czech Republic (see Figure 1). **In Slovakia, cumulative food price growth reached 42% over the period 2020–2023,** which is double the cumulative increase in overall inflation

¹¹ Baffes, J. – Mekonnen, D. – Temaj, K. (2024). „Food prices mirroring past peaks despite continuous drop“.

¹² OECD (2024). „Competition in the Food Supply Chain“.

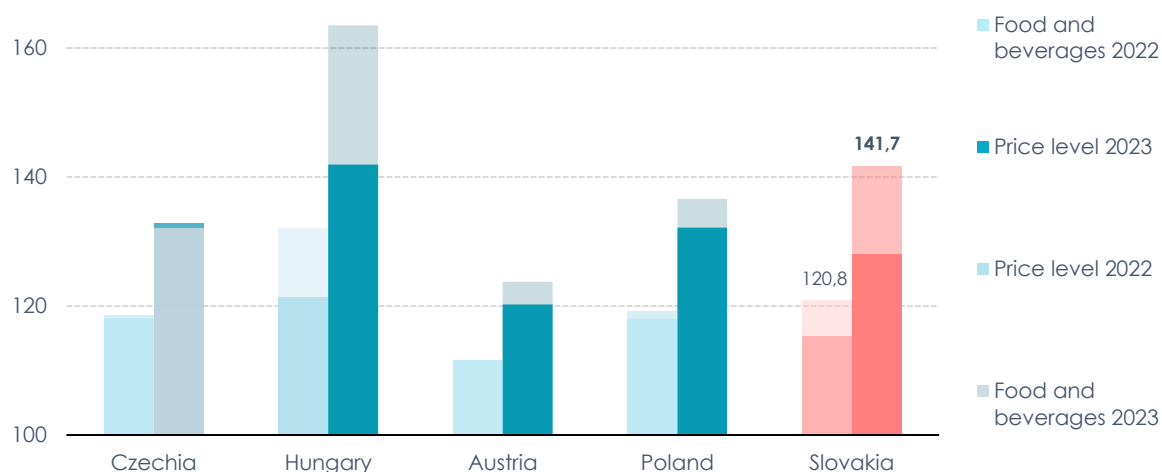
¹³ Ministry of Finance of the Slovak Republic (2024). „Analýza cenového vývoja základných druhov potravín 9/2024“.

¹⁴ European Commission (2016). „The competitive position of the European food and drink industry“.

¹⁵ Vlachynský, M. (2023). „Chlieb a politika“.

(21%). A higher rate of food price growth than in Slovakia was recorded only in Hungary, partly as a result of price and quantity regulation measures (see Box 2).

Figure 1 - Food prices in Slovakia grew faster than inflation and the EU food prices



Note: The values represent the cumulative increase in the price level (HICP) expressed by an index with a base year of 2020. The highlighted part of the bar graph represents the increase in the overall price level compared to the change in the price level of food and beverages

Source: Author's own calculations based on data from the Eurostat database (prc_hicp_aind, data updated on 17/09/2024)

Box 2 – Effects of political interventions on excessive price increases

A market economy is generally associated with price liberalisation, which serves as an instrument to foster the development of the business environment and to create conditions for competitive markets. While acknowledging the validity of this general principle, it is equally important to recognise the risks arising from its violation. **Attempts to address structural or social challenges through price policy, whether as a substitute for social policy or as a response to the lack of competitiveness of certain firms, may seriously disrupt market functioning.** Such interventions often generate distortions of competition and may produce counterproductive effects on economic stability.¹⁶

The rapid increase in price levels in recent years has led to a variety of political responses across EU Member States, many of which directly intervened in the price mechanism. A notable example is Hungary, where a combination of high turnover taxes, regulatory changes and, in particular, price controls on selected food products resulted in a sharp rise in food prices and, in some cases, shortages of certain items on store shelves.¹⁷ In 2022, Hungary introduced price caps on several staple food products (including sugar, wheat flour, sunflower oil, pork, and milk), administratively fixing prices at their October 2021 level. These measures led to the withdrawal of some regulated products from the market, reduced availability of goods, and pressure on retailers, who were unable to sell below production costs. This development triggered price increases in other, non-regulated products and weakened overall market supply. Following the abolition of price caps in December 2022, food prices rose sharply. Similar difficulties were observed in Croatia, which in 2023 introduced price caps on selected basic foodstuffs. **Although price interventions may provide short-term protection to consumers, they undermine competitiveness, reduce efficiency, and discourage investment in the longer term**¹⁸.

By contrast, countries such as Germany, the Netherlands, and Austria refrained from introducing administrative price caps during the inflationary crisis. In Germany and Spain, support was channelled through the temporary reduction of VAT on selected food products, while other mechanisms, such as one-off household compensation schemes, were also applied. These measures did not disrupt market functioning nor did they reduce the incentives of producers and retailers to continue their economic activity. **According to OECD analysis, administrative interventions in the price mechanism contributed to price instability and weakened investment activity across the agri-food value chain**¹⁹.

Markets are generally more effective in regulating margins and prices than government interventions. States do not possess precise information on firms'

¹⁶ Ministry of Finance of the Slovak Republic (2024). „Koncepcia cenovej politiky na roky 2024 – 2027“.

¹⁷ Vlachynský, M. (2023). „Chlieb a politika“.

¹⁸ Cramon-Taubadel, S. – Goodwin, K. (2021). „Price Transmission in Agricultural Markets“.

¹⁹ OECD (2023). „Economic Policy Reforms 2023: Going for Growth“.

production costs or consumer demand. Price regulation may therefore result in food shortages, reduced agricultural output, unwarranted profit losses or even losses for firms, and, ultimately, the collapse of certain segments of the food supply chain, with long-term negative consequences for consumers, taxpayers, and food security.

Repeated attempts at price regulation and interventions in the free market have proven to be ineffective. Price controls and margin regulations lead to distortions manifested in shortages of regulated goods, lower production, declining investment, rising prices of non-regulated products, the long-term erosion of competitiveness among domestic producers, and the crowding-out of smaller producers from the market. **In a market economy, economically unjustified interventions in price policy are highly risky, as they adversely affect microeconomic processes and, in the end, macroeconomic indicators.** Effective intervention requires a well-designed system that is transparent, consistent, and flexible, with clearly defined institutional responsibilities.

Price regulation must be justified and warranted, and is typically applied in cases of natural monopolies or severe market failures, conditions that are not currently present in the food supply chain. While price regulation may generate short-term positive effects, in the long run it constitutes a problematic intervention in the natural functioning of markets. **Price controls distort the fundamental information signal on which markets rely – the price itself.** A negative example can be observed in Hungary's regulation of fuel prices, which led to the exit of certain retail operators who were unable to adjust unit costs below the price cap. Following the lifting of regulation in December 2022, retail petrol and diesel prices rose sharply, exceeding levels in neighbouring countries, as retailers sought to recoup earlier losses.

Countries that implemented price regulation on selected food products not only faced supply shortages of the regulated items but also **recorded higher price growth in non-regulated goods and services.**²⁰ This clearly demonstrates that discussions on competition in the agri-food chain must take account of sector-specific characteristics. The potential impact of policy measures varies depending on the structure of the food supply chain. **Policies that may be effective in one context can be ineffective, or even counterproductive**²¹. Price policy should therefore not substitute for other public policies but complement them, while ensuring consumer protection in cases of genuine market failure. **The promotion of competitive market conditions should take precedence over excessive state intervention in price formation.**

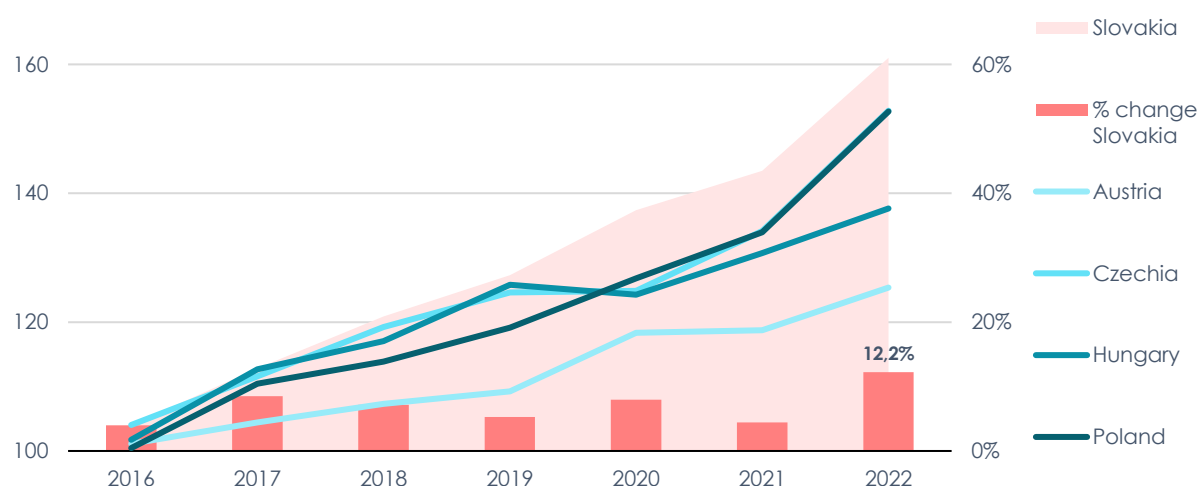
²⁰ Ministry of Agriculture and Rural Development of the Slovak Republic (2023). „Analýza a odporúčania k riešeniu potravinovej inflácie na Slovensku“.

²¹ European Commission (2016). „The competitive position of the European food and drink industry“.

1.1 Food consumption

Since 2015, household food consumption in Slovakia has recorded the most significant increase in the entire region, positioning the country at the forefront of food consumption growth dynamics. **This trend reflects specific factors influencing consumer behaviour and economic conditions in Slovakia, including price growth, declining real incomes, and changes in product availability.** While food consumption has been gradually increasing across all EU Member States, Slovakia stands out in terms of pace, highlighting differences in the socio-economic conditions of EU countries.²² **Up until 2021, growth in consumption was primarily driven by rising real wages, as nominal wage growth exceeded the rate of price increases.** However, from 2022 onwards, **nominal consumption growth was largely fuelled by a sharp rise in food prices, which outpaced consumption growth at 12.2%. As a result, both real consumption and real wages declined.**

Figure 2 - Slovakia recorded the highest increase in household food consumption in the region



Note: The evolution of food consumption (according to the COICOP methodology) is based on nominal values in million euros, represented by an index with a base year of 2015

Source: Author's own calculations based on data from the Eurostat database (nama_10_co3, data updated on 24/10/2024)

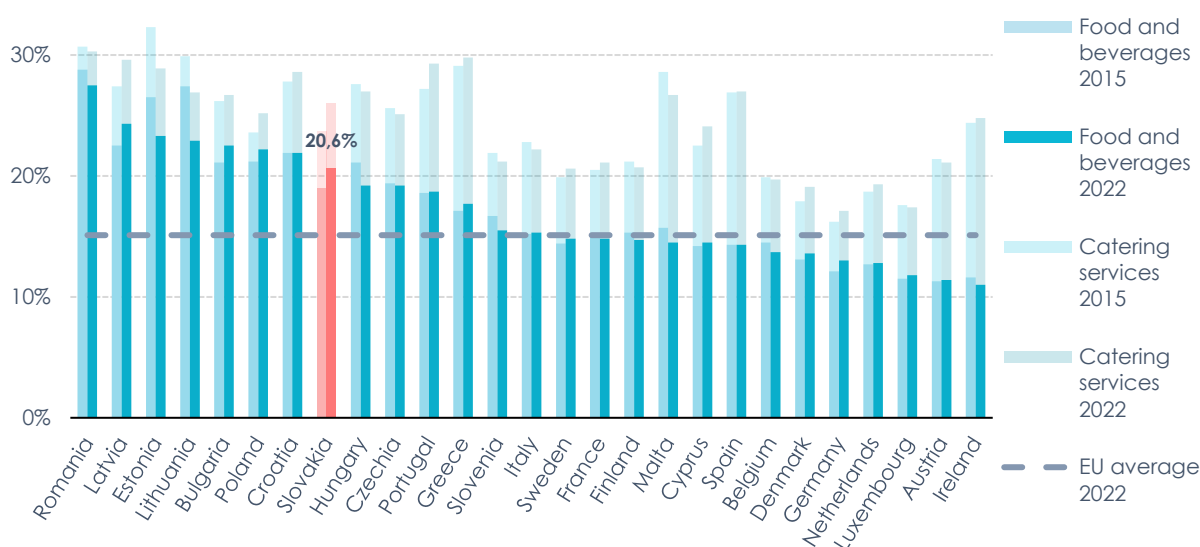
The decrease in real wages has translated into a higher share of household expenditure on food, given that food represents an essential good characterised by low demand elasticity, meaning consumption is less responsive to price changes. **The share of slovak household expenditure on food and catering services significantly exceeds the EU average and shows a continued upward trend.** This development is the outcome of multiple factors, most notably high inflation in recent years, which has reshaped consumer behaviour and spending structures across the EU. Slovakia ranks among the Member States with the highest share of expenditure on food and

²² Údaje podľa metódy COICOP, ktoré vychádzajú z nominálnych hodnôt.

restaurant services, reflecting both stagnation or decline in disposable incomes in purchasing power parity terms and the rapid increase in food prices.

In 2022, expenditure on food and catering services reached 26% of household budgets, of which 20.6 percentage points related to food and non-alcoholic beverages. Since 2015, this share has risen by almost 2 percentage points, while the EU average has remained at 15% (see Figure 3). **The combination of growing household consumption and limited purchasing power means that high food prices have a disproportionately strong impact on slovak consumers, as their relative weight in total expenditures continues to rise.** This underlines regional disparities within the EU in households' ability to adjust to increasing living costs, with these challenges being particularly acute in Slovakia. The situation points to the need for policy solutions to ease households' financial burden, particularly by strengthening real incomes.

Figure 3 - Slovak households spend more on food and catering than the EU average, the share is rising further



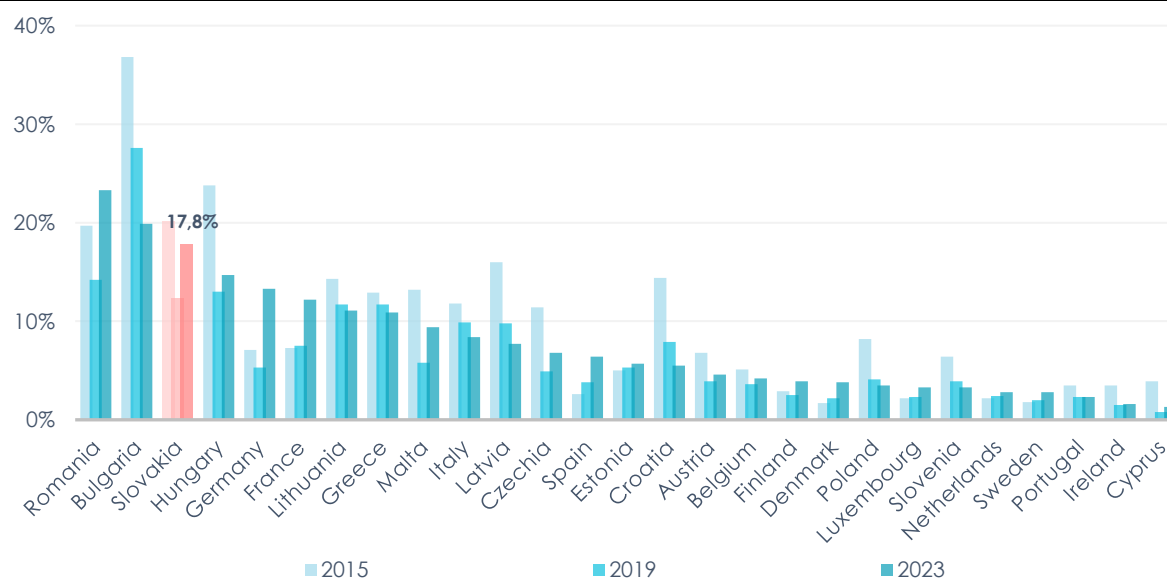
Source: Author's own calculations based on data from the Eurostat database (nama_10_co3, data updated on 24/10/2024)

As a consequence, **Slovakia ranks among EU countries with the highest proportion of households unable to afford sufficient food.** In 2022, more than one-fifth of the population was affected, signalling a marked deterioration in food affordability (see Figure 4). Food poverty now affects nearly one in five households, with its severity substantially aggravated by the inflationary crisis.

This trend is shaped not only by external shocks, such as global economic crises and supply chain disruptions, but also by domestic factors, including low real wages in the context of rising living costs. Furthermore, a recent study has shown that **poorer households in the United Kingdom are more exposed to risks stemming from market concentration, as a greater share of their expenditure is allocated to concentrated sectors of the economy.** A similar pattern has been observed in EU. An OECD analysis

of 17 sectors indicated that **the lowest-income households spend on average 44% of their total budget in concentrated industries**. Addressing this issue requires a systematic approach, combining targeted support for the most vulnerable groups, improved access to essential food products, and measures to strengthen the competitiveness of firms in the internal market, potentially leading to price reduction or stabilisation²³.

Figure 4 - Food poverty affects nearly fifth of slovak households, worsened by rising prices



Note: The indicator refers to the percentage of people in the total population who are in a state of inability to afford a meal with meat (or vegetarian equivalent) every other day. The data are part of the EU-SILC statistical survey

Source: Eurostat database (ilc_mdes03, data updated on 04/10/2024)

In recent years, Slovakia has experienced a sharp rise in household food consumption, placing it among EU countries with the highest share of food-related expenditure. This reflects not only rising living costs, but also changes in consumer behaviour and price developments. **It is therefore essential to devote greater attention to analysing the factors shaping food price formation, including global economic dynamics, domestic conditions, and the functioning of logistics chains within the agri-food sector.** A deeper understanding of these interlinkages will help design policy measures to mitigate negative impacts on the population, particularly on socially vulnerable groups.

²³ Davies, S. - Mariuzzo, F. (2022). „The changing face of antitrust in the world of Big Tech: Collusion versus Monopolisation“.

1.2 Food price level

Consumer price inflation in Slovakia reached historically high levels between 2021 and 2023. According to estimates by the Ministry of Finance of the Slovak Republic, **the main drivers of elevated inflation in 2021 and 2022 were higher input costs, which were subsequently passed through to consumer prices. The acceleration of inflation was triggered by a sequence of external shocks**²⁴. The global pandemic restricted population mobility, leading to a shift in household consumption from services towards goods. This surge in demand, combined with the asynchronous timing of lockdowns across countries, caused shortages of production components and a subsequent increase in their prices. From mid-2021, Russia began to curtail natural gas supplies to Europe, resulting in a sharp escalation of energy prices.

In the second half of 2022, when inflation peaked, rising profit margins also became an important factor. **Due to the relatively higher energy intensity of its food industry, Slovakia is more sensitive to such cost pressures than more advanced EU economies. This sensitivity contributed to food inflation in Slovakia ranking among the highest in the European Union.** In 2023, year-on-year comparisons continued to show faster food price growth in Eastern EU Member States relative to Western ones, reflecting structural differences in regional economic conditions and corporate cost structures.

Despite a partial decline in global food commodity prices, food price pressures in Slovakia persisted, primarily due to significantly higher costs across the entire value chain. Food producers faced markedly increased prices of fertilisers, feed, energy, raw materials, transport, and packaging, reflecting recent disruptions in global supply chains. As a result, the Slovak food sector recorded the fastest price growth among all consumer categories, making a substantial contribution to the overall high inflation rate. **This situation is likely to persist, with food prices expected to continue rising from 2025 onwards, albeit at a more moderate pace than during the record years 2022–2024**²⁵. While the tax reform includes a reduction in VAT rates on food, which could temporarily dampen price growth, this effect is expected to be short-lived. The introduction of a transaction tax, increasing costs across the production chain, is likely to exert renewed upward pressure on food prices. A slight acceleration in food consumer price inflation and its increasing contribution to the overall price level has already been observed in early 2025²⁶.

In 2023, food prices in Slovakia reached 106% of the EU average, exceeding the Union mean. By contrast, significantly lower food prices were recorded in Poland, at just 76% of the EU average. Countries such as Czechia, Lithuania, Slovenia and Hungary were broadly aligned with the EU average, while Latvia, Slovakia and Estonia exceeded it (see Figure 5). **Year-on-year, food prices in Eastern EU Member States increased faster**

²⁴ Ministry of Finance of the Slovak Republic (2024). „Analýza cenového vývoja základných druhov potravín 9/2024“.

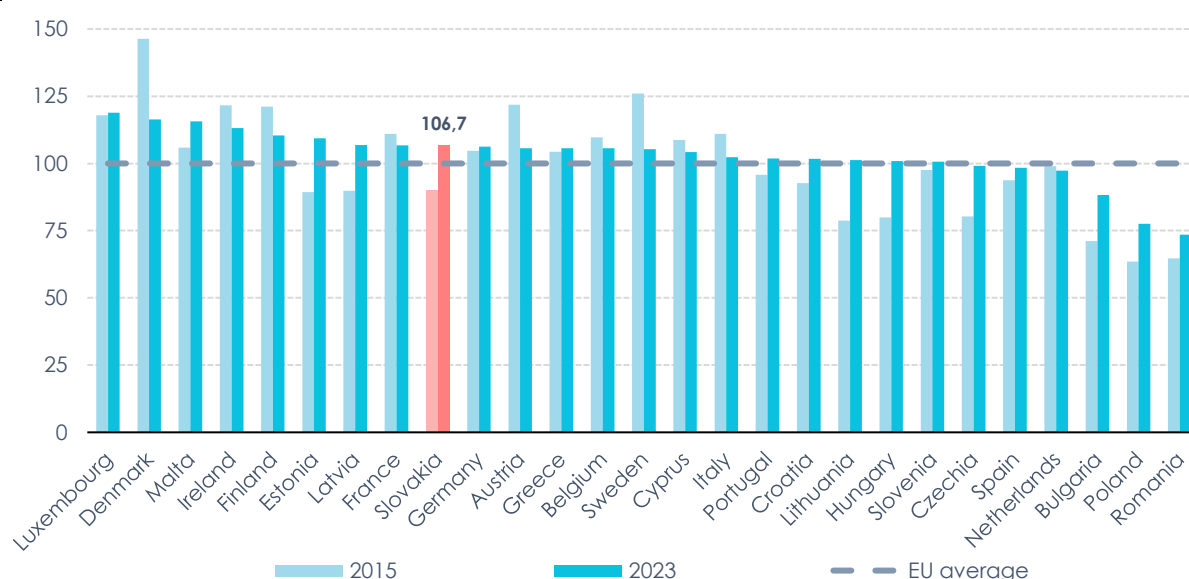
²⁵ Ministry of Finance of the Slovak Republic (2025). „Slovenská ekonomika vstupuje do globálnej ekonomickej neistoty“. Makroekonomická prognóza na roky 2024 - 2029.

²⁶ National bank of the Slovak republic (2025). „Za zrýchlením inflácie boli najmä dane a potraviny“, UMS analysts' comment.

than in Western Member States, highlighting persistent regional divergences in price dynamics.

Figureical evidence indicates a gradual increase in price levels between 2015 and 2023 across most EU countries. Economically weaker Member States with initially lower food price levels recorded comparatively stronger price growth. **This convergence process contributes to the gradual alignment of food price levels** (in purchasing power parity terms) **across the EU, thereby narrowing regional disparities.**

Figure 5 - EU food prices are leveling off, but price levels become misaligned with purchasing parity of less developed economies



Note: Index EU27=100

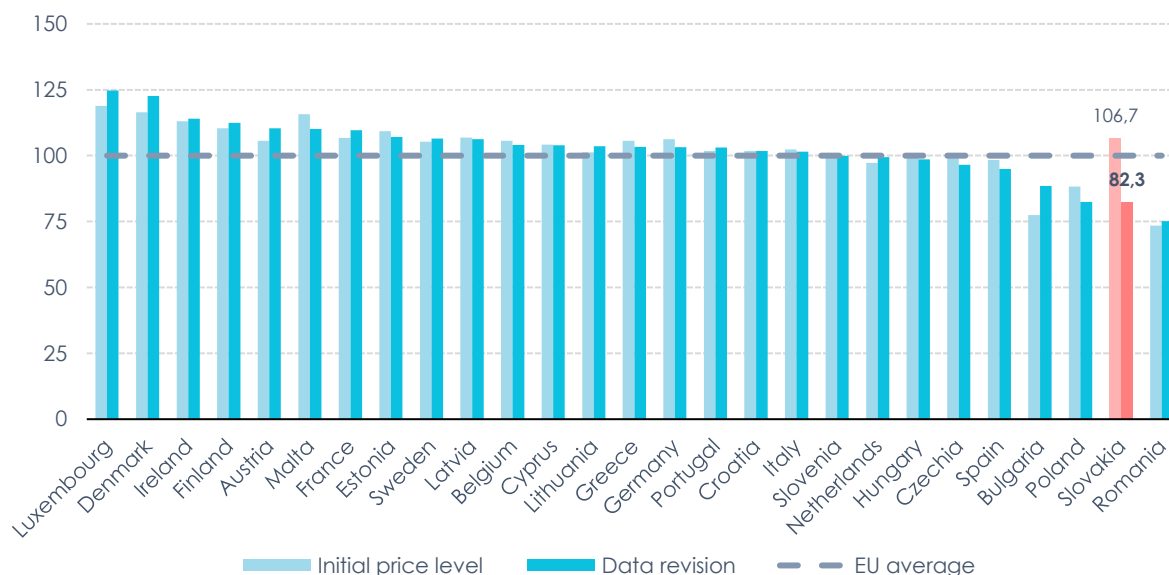
Source: Author's own calculations based on data from the Eurostat database (prc_hicp_aind, data updated on 17/09/2024)

During the analysis, Eurostat revised its statistical database, which significantly altered Slovakia's reported consumer price index for food. According to the original June 2023 data, Slovakia ranked among the countries with the most expensive food in the region. However, following methodological updates, the revised data indicated that food prices in Slovakia were the lowest in the region, even below those in Poland. The index for "Food and non-alcoholic beverages" declined from 106.7% to 82.3% of the EU average, a substantial adjustment of almost 25 percentage points (see Figure 6). This revision does not reflect a statistical error or an actual drop in food prices in Slovakia, but rather the implementation of more precise and modernised data collection methods (see Box 3). As the revision relates solely to 2023 and earlier series remain unchanged, time-series comparisons before and after the revision are not appropriate.

Similar methodological revisions have led to sharp index declines in other EU countries. For example, in Denmark the introduction of the new data collection system in 2016 resulted in a 15.7-percentage-point year-on-year drop in the food and beverages

consumer price index²⁷. Austria implemented the same methodology in 2019, leading to a 15.9-percentage-point reduction²⁸. These cases illustrate how harmonisation and modernisation of statistical methodologies can significantly affect headline indicators, which is critical to account for in international price comparisons.

Figure 6 – Data revision places Slovakia as the cheapest food market among its region



Note: Index EU27=100

Source: Author's own calculations based on data from the Eurostat database (prc_hicp_aind, data updated on 14/01/2025)

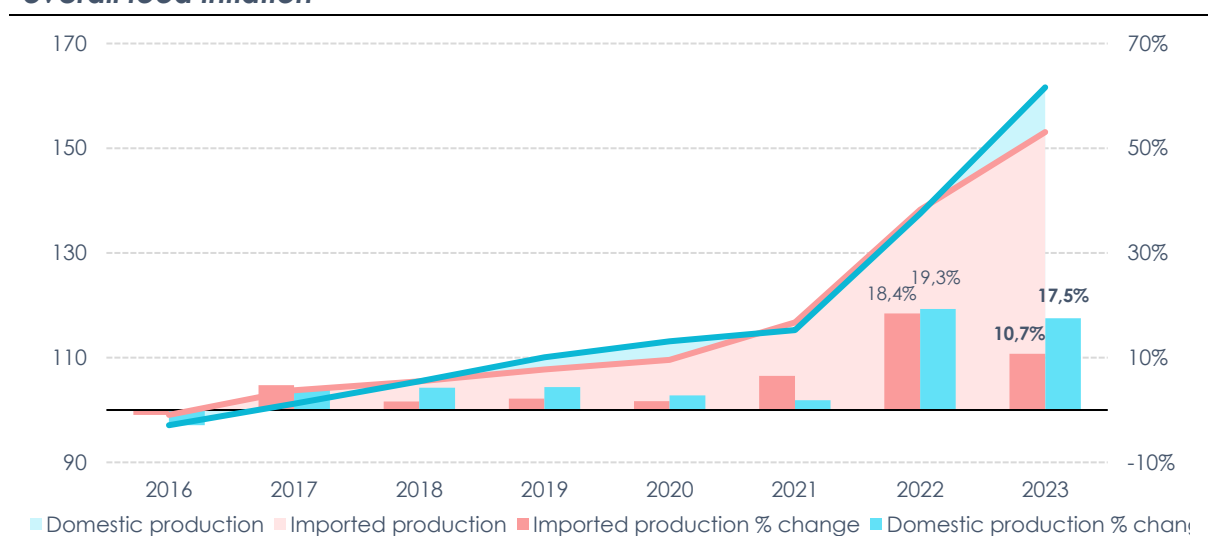
At the same time, price convergence, the functioning of the EU single market, and the relatively low capital intensity of labour have weakened the position of domestic producers. The former competitive advantage of lower costs and prices has eroded, rendering foreign production relatively cheaper compared to domestically produced food. This trend has contributed to a growing share of imported food in domestic consumption, as consumer preferences are strongly shaped by final price differentials.

Until 2021, domestic and imported food prices in Slovakia followed a similar moderate growth trajectory. A sharp break occurred in 2022, when both categories recorded a steep price surge. However, **domestic food prices began rising faster than those of imported products, pushing the domestic food price level above that of imports in recent years.** Notably, domestic food prices had already slightly exceeded import prices as early as 2018. By 2023, the cumulative gap in growth between the two categories had widened to 8 percentage points over the last decade (see Figure 7).

²⁷ Eurostat (database prc_ppp_ind, data updated on 14/01/2025)

²⁸ Statistics Austria (2023). „Use of scanner data and webscraping in price statistics“.

Figure 7 - Domestic production is more expensive than imports, which dampening overall food inflation



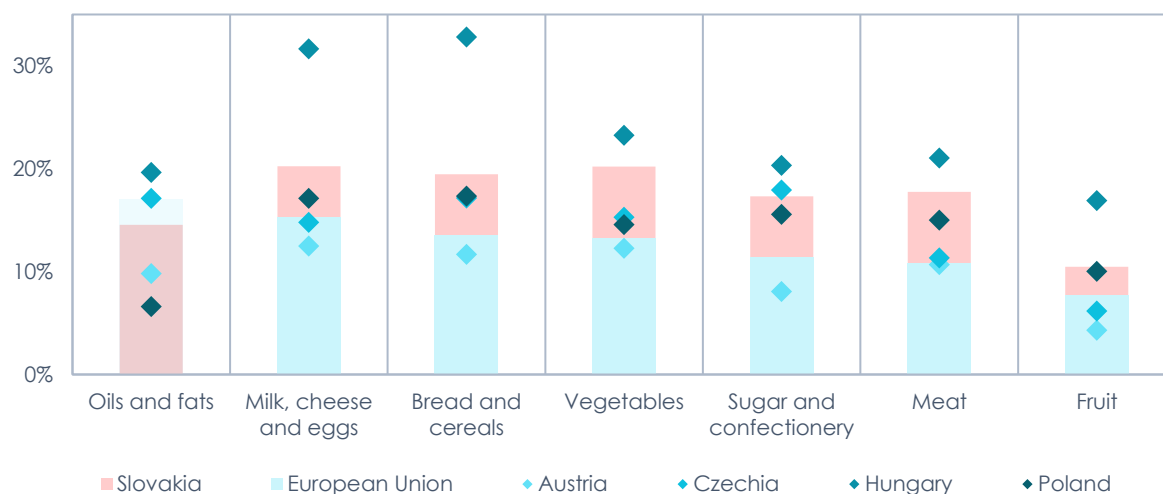
Source: Author's own calculations based on data from the Eurostat database (prc_hicp_aind, data updated on 17/09/2024)

Food inflation in Slovakia was driven across all product categories, with only Hungary recording higher growth rates across the board (see Figure 8). Between 2021 and 2023, **Slovakia registered faster price growth in nearly all categories compared with the EU average**, with the exception of "Oils and fats", where EU growth exceeded Slovakia's by 2.4 percentage points.

The fruit category exhibited the lowest price volatility not only in Slovakia but also across all countries under review. While seasonal food products, including fruit, are typically sensitive to changes in price levels due to fluctuations in supply and demand driven by a range of exogenous factors, in this instance they proved to be more stable. The main drivers of fruit price volatility are unexpected changes in climatic conditions and weather-related shocks, which may trigger abrupt shifts in supply or demand. Despite these risks, fruit prices remained relatively stable. **This development can be attributed to the fact that the recent increase in food prices was primarily driven by higher input costs in agricultural production, particularly rising prices of agricultural commodities and energy.** These factors exerted only a limited impact on seasonal food products such as fruit, compared with other food categories.

Between 2021 and 2023, Slovakia experienced a higher average annual growth rate of food prices across all categories than neighbouring Poland and Austria, underlining the breadth of price increases across the entire food basket. **This pattern confirms that food inflation was not the result of price hikes in a narrow set of products, but was broad-based across all categories.**

Figure 8 - All food categories drove inflation during its peak, with Hungary showing the strongest rise



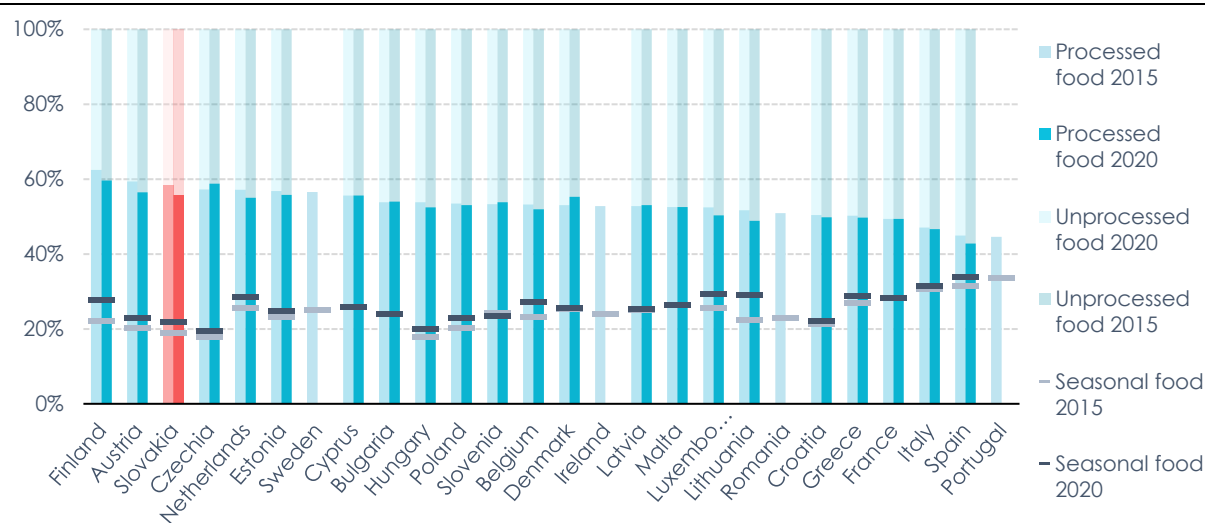
Note: The average price level change reflects the average annual percentage change observed between years 2021/2022 and 2022/2023

Source: Author's own calculations based on data from the Eurostat database (prc_hicp_aind, data updated on 17/09/2024)

According to the Ministry of Finance of the Slovak Republic, **the relatively high energy intensity of Slovakia's food industry may also be linked to the large share of processed foods in the slovak consumption basket**²⁹. EU Member States with higher shares of seasonal and unprocessed food consumption typically exhibit lower energy intensity in food production, reflected in slower food price growth. On average, seasonal food prices in the EU increased one-third more slowly than the rest of the food basket. **In Slovakia, processed food consumption was the third highest in the EU in 2020**, while the share of seasonal foods was the second lowest, at 19%, just ahead of Czechia (see Figure 9). The long-term downward trend in seasonal food consumption is likely to further reinforce the higher energy burden of slovak food production.

²⁹ Ministry of Finance of the Slovak Republic (2024). „Analýza cenového vývoja základných druhov potravín 9/2024“.

Figure 9 - Slovaks prefer processed foods, with low seasonal food consumption compare to majority of EU states

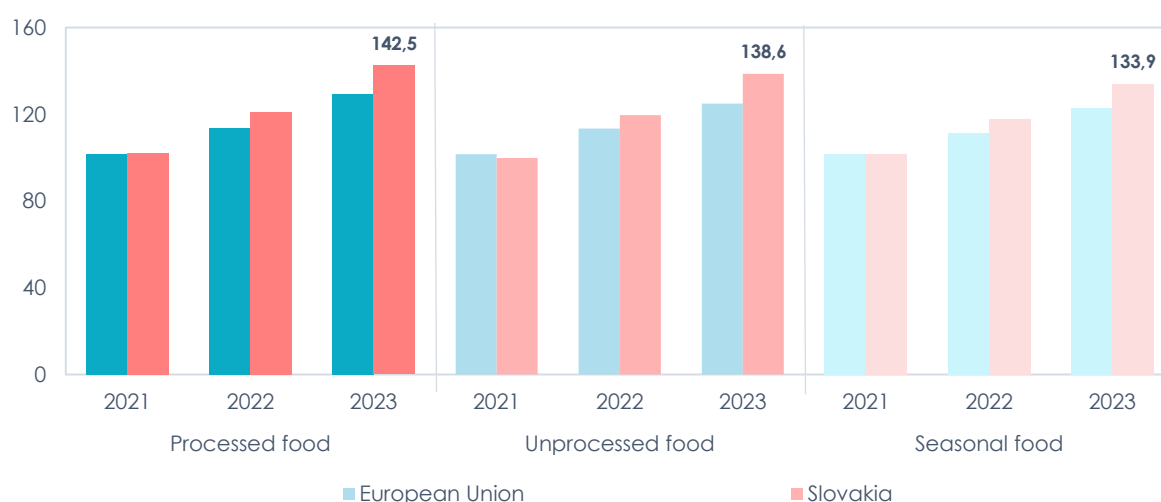


Note: Categories "Processed food", "Unprocessed food" and "Seasonal food" are aggregated according to the ECOICOP methodology

Source: Author's own calculations based on data from the Eurostat database (hbs_exp_t121, data updated on 25/07/2024)

Seasonal foods recorded the lowest price growth, while processed foods showed the highest cumulative increase since 2020 (see Figure 10). Between 2020 and 2023, processed food prices rose cumulatively by 42.5%, exceeding unprocessed food price growth by 4 percentage points and seasonal food growth by 8.5 percentage points. With processed foods representing nearly 60% of the total consumption basket, their weight has a significant impact on both overall price developments and the energy intensity of Slovakia's food sector.

Figure 10 - Higher energy costs have pushed processed food prices up



Source: Author's own calculations based on data from the Eurostat database (prc_hicp_aind, data updated on 17/09/2024)

Box 3 – Methodological changes behind the sudden drop of food price level

Until the end of 2023, the Statistical Office of the Slovak Republic (SO SR) calculated the Consumer Price Index using data collected directly in retail outlets across Slovakia. These data, referred to as so-called „retail prices“ **did not account for discounts or promotional sales, and therefore provided only a partial representation of actual consumer expenditures.** In an effort to enhance the accuracy and quality of statistical data, the SO SR initiated, in 2023, cooperation with the largest retail chains to obtain transactional data through scanner technology.³⁰

The new methodology, known as ‘scanner data,’ enables the monitoring of actual prices, including discounted and promotional items. This approach captures a broader spectrum of prices and transactions, thereby more accurately reflecting the expenses of typical consumers. Furthermore, the methodology incorporates diverse brands and manufacturers, mitigating the risk of bias arising from a limited product selection. A substantial share of discounted goods now contributes to the calculation of average prices, which was not possible under the previous system.

Currently, the SO SR collects weekly data on food and non-alcoholic beverages from the five largest retail chains, covering approximately 80% of total retail sales in this sector. This transition has improved the precision of price measurement and better reflects real consumer behavior in the market.

Several European Union Member States already utilize scanner data, enabling them to report lower average food prices in their official statistics.³¹ With the adoption of this modern data source, Slovakia has joined the group of twelve European countries that were using such data for inflation calculation prior to 2021, including Germany, Italy, the Netherlands, Sweden, as well as Poland and Slovenia³². **It is anticipated that additional Member States will gradually adopt the same methodology or are currently in the process of implementation³³.** This transition may lead to comparable adjustments in their statistical outputs. At the same time, **it could result in a slight upward revision of slovak values, as the average value of the EU consumption basket, against which slovak prices are benchmarked, would decrease.**

³⁰ Statistical Office of the Slovak Republic (2024). „Informácia o zmene metodiky výpočtu indexu spotrebiteľských cien za potraviny a nealkoholické nápoje“.

³¹ Report from the Commission to the European Parliament and the Council prepared in accordance with Regulation (EU) 2016/792 on harmonized consumer price indices and the house price index

³² European Union (2022). „Guide on Multilateral Methods in the Harmonised Index of Consumer Prices“.

³³ European Union (2024). „Harmonised Index of Consumer Prices (HICP) - Methodological Manual 2024 edition“.

2 International position of the slovak food vertical

Since the onset of Russia's military aggression against Ukraine in February 2022, global concerns have emerged regarding potential shortages of certain foodstuffs and agricultural commodities. These concerns primarily stemmed from the disruption of production in Ukraine, which resulted in the cessation of cultivation or manufacturing of certain products, thereby limiting Ukraine's capacity to export agricultural goods, particularly wheat. **Uncertainty regarding input costs for the forthcoming season may have incentivized some farmers to withhold production in anticipation of future price increases.** This behavior further exerted upward pressure on commodity prices, influencing both supply and demand dynamics in the market³⁴.

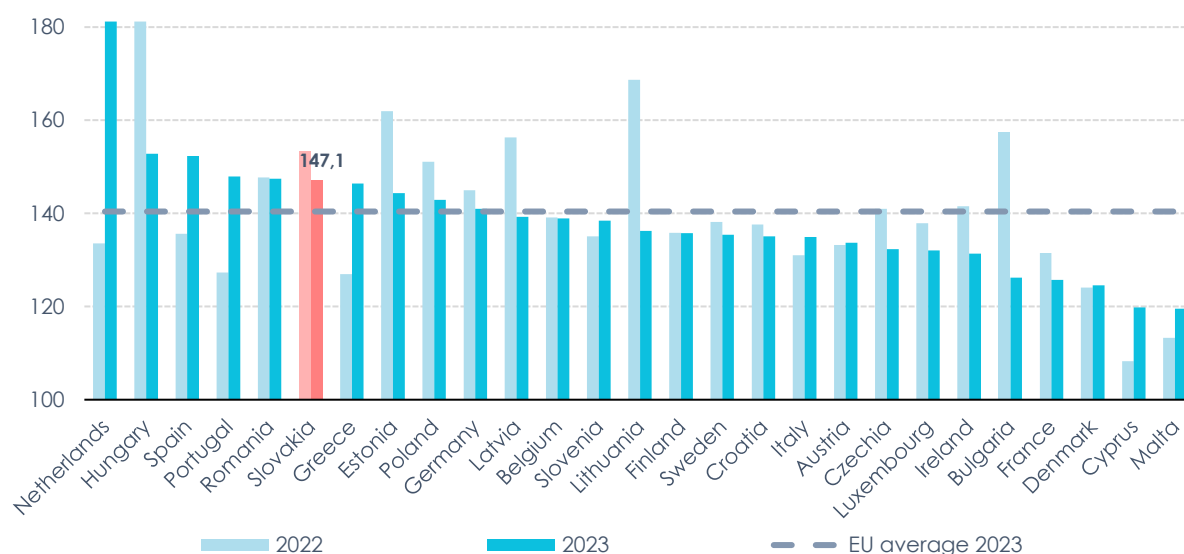
Price developments for agricultural commodities in Slovakia have largely mirrored global market trends. The sharp increase in prices observed towards the end of 2022 was particularly pronounced within the agricultural production sector. The growth rate of agro-commodity prices in Slovakia ranked among the highest in the European Union (see Figure 11). **In 2022, the cumulative increase in slovak agro-commodity prices since 2020 exceeded 53%,** driven largely by cereals and industrial crops, whose year-on-year price increases surpassed 50% (see Annex 1). In contrast to most European producers, slovak prices declined in 2023. Following the initial market disruptions and panic caused by the interruption of Ukrainian production, the market stabilized. Prices of cereals and industrial crops returned to levels observed before 2022, though overall price levels remained elevated, largely due to rising costs in animal products, notably pork, milk, and fresh eggs.

In an international comparison, significant increases in agricultural production prices in 2022 were also recorded in the Baltic states and Hungary, primarily due to higher prices for oilseeds and sugar beet. Conversely, in 2023, the Netherlands experienced substantial price growth, particularly in the vegetable sector, including onions, carrots, and potatoes.

Analysis of selected **agro-commodity prices on international markets indicates that slovak commodities generally align with the median of European prices** (see Annexes 2 and 3). An exception is observed in the case of potatoes, which consistently exceed the EU median. Despite this, slovak farmers maintain price competitiveness, as their pricing strategies allow them to respond efficiently to market developments and to preserve stable positions within the European agricultural market.

³⁴ Ministry of Finance of the Slovak Republic (2024). „Analýza cenového vývoja základných druhov potravín 9/2024“.

Figure 11 - Slovak agri-commodity prices have outpaced the EU average since 2020



Note: The price level is represented by the price index at current prices with a base year of 2020

Source: Author's own calculations based on data from the Eurostat database (agri_pi15_outa, data updated on 19/10/2024)

Agro-commodities, serving as inputs for processors and food retailers, play a critical role in the pricing of final products. While their influence on retail food prices is significant, it is not the sole determinant. **Other critical factors affecting price formation include energy, labor, and logistics costs, as well as technological innovations within production and distribution processes. Additionally, international trade relations, regulatory frameworks, and competitive dynamics at both local and global levels exert substantial influence on pricing.**

The current economic environment, characterized by volatile price dynamics, geopolitical tensions, and unpredictable climatic conditions, underscores the need for comprehensive analysis of the factors shaping price trends within the food value chain. **These factors affect not only producers and processors directly, but also the overall competitiveness of the sector under both domestic and international conditions.**

Accordingly, the subsequent sections of this chapter provide a detailed examination of the key economic and competition-related factors, alongside mechanisms influencing the performance of food sector activities, particularly in an international context, thereby offering deeper insight into the specific position of slovak sectors within the food value chain.

2.1 Sectoral concentration

Effective competition incentivises firms to reduce prices, improve product quality, increase productivity, and foster innovation. This process rewards more efficient firms with greater market shares, while gradually displacing less efficient enterprises, thereby supporting higher levels of investment, innovation, productivity, and employment. A key element in the assessment of market power is the analysis of sectoral structures in which firms operate. While such analysis alone does not provide a complete picture of the extent of market power, it nevertheless offers valuable insights into the structural position of firms relative to other market participants.

Sectoral concentration data can therefore provide indicative evidence regarding the conditions of competition. A number of studies document a relationship between concentration levels and market power in certain industries³⁵. Research conducted by the European Commission suggests that in advanced economies, including within the EU, there has been an increase in concentration, margins, and profitability, accompanied by a decline in business dynamism³⁶. By contrast, OECD analysis of the agri-food sector indicates that available evidence does not confirm systemic competition concerns in advanced economies³⁷.

Within this analysis, we focus on three alternative indicators of market power: the concentration ratio (CR), the Herfindahl-Hirschman Index (HHI), and margin estimates. **The concentration ratio and the HHI reflect the extent to which an economic segment is dominated by a limited number of firms, while the level of margins captures the ability of firms to set prices above marginal costs** (see Box 4 for further details). In general, the concept of margins is more closely aligned with the traditional understanding of market power, as it directly compares price levels relative to costs³⁸. De Loecker documents an increase in average margins in the United States, rising from approximately 21% above marginal costs in 1980 to 61% in 2016. Evidence suggests that this upward trend was primarily driven by rising margins among the largest firms and accompanied by growing profitability. Although much of the empirical research has focused on the US, similar patterns appear to be observable in the EU³⁹. By contrast, CR and HHI reflect a broader concept of market power, encompassing bargaining power. They do not directly measure firms' ability to influence prices but rather point to relative market shares and the intensity of competition.

Data from the CompNet database show that between 2010 and 2020, within the food supply chain, the **concentration of the ten largest firms (CR10) was highest in food processing, followed by retail and wholesale** (see Figure 12). This pattern is evident not only in Slovakia but also across the European economies under review.

³⁵ Deconinck, K. (2021). „Concentration and market power in the food chain“.

³⁶ European Commission (2024). „Protecting competition in a changing world - Evidence on the evolution of competition in the EU during the past 25 years“.

³⁷ OECD (2024). „Competition in the Food Supply Chain“.

³⁸ Cavalleri et al. (2019). „Concentration, Market Power and Dynamism in the Euro Area“.

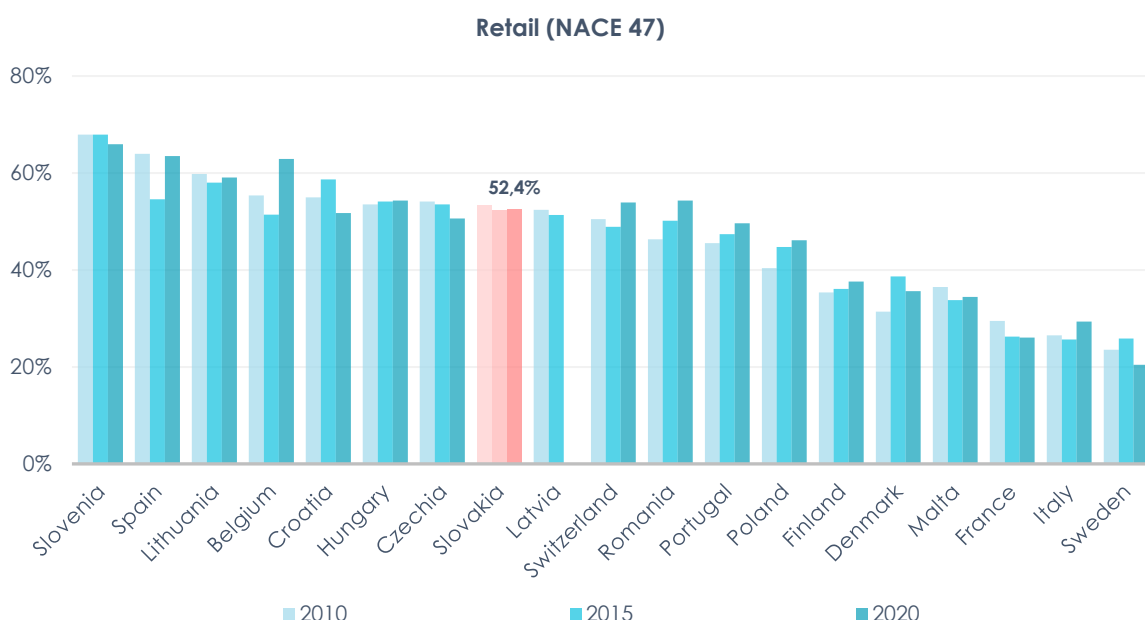
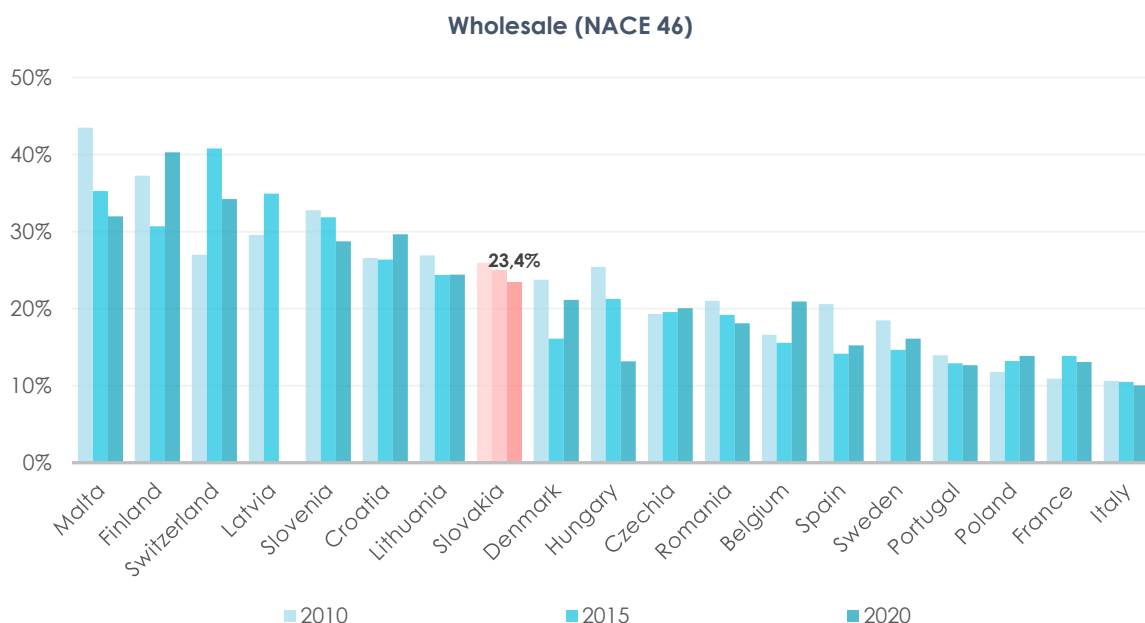
³⁹ De Loecker, J. - Eeckhout, J. - Unger, G. (2020). „The rise of market power and the macroeconomic implications“.

In retail, the ten largest firms account for between 20% and 70% of market share, depending on the Member State. In wholesale, the corresponding range is between 10% and slightly above 40%. In food processing, the distribution of concentration levels is wide across sub-sectors. **Slovakia slightly exceeds the average across all food-related sectors, although a modest downward trend in market shares can be observed.**

The data further suggest that countries with smaller domestic markets tend to display higher levels of concentration. International comparison indicates that the highest market shares of the ten largest firms are typically found in Nordic and Baltic countries. By contrast, larger markets such as France and Italy record the lowest levels of concentration within the observed sectors.

Figure 12 - Market share of Slovakia's top 10 food firms matches the EU average





Note: Calculation of indicator CR10 refers to 2-digit NACE code

Source: Author's own calculations based on data from the CopmNet database

Nevertheless, many sectors remain characterised by low concentration, and sector-level measurement presents a number of methodological challenges. **Sectors are often broadly defined and may not capture the degree of concentration in specific markets where firms effectively compete.** This may reflect the use of broad industrial classifications that aggregate data, combining high market shares held by firms in narrowly defined segments. For example, in retail and wholesale, **sectoral data are aggregated beyond food-related activities, resulting in lower reported concentration compared to industry-level measures**⁴⁰. Moreover, important aspects such as imports

⁴⁰ European Commission (2024). „Protecting competition in a changing world - Evidence on the evolution of competition in the EU during the past 25 years“.

and exports are often overlooked, potentially distorting the assessment of market shares. **While the relationship between concentration and market power is not always straightforward, low concentration generally implies limited market power.** A more detailed analysis of narrowly defined industries in Slovakia is presented in Section 3.1 Sectoral Concentration.

Given the limitations of sectoral concentration data in CompNet, international comparison of competition intensity based on the HHI is informed by a recent study on the state of competition in the EU food manufacturing sector⁴¹. According to this analysis, **35% of sub-sectors are highly concentrated** (HHI above 2500), **14% are moderately concentrated** (HHI between 1500 and 2500), while **51% are unconcentrated** (HHI below 1500). For instance, sugar, tobacco, beer and malt, and other fermented beverages are classified as concentrated across all observed countries. By contrast, fruit and vegetable processing, bakery products, animal feed, and other food manufacturing are considered unconcentrated across the sample. **Some countries, however, tend to display higher levels of sub-sector concentration.** For example, Hungary, Finland, and Sweden report a greater number of concentrated sub-sectors, while Italy and Spain report fewer. **These results are not unexpected, as smaller economies typically exhibit higher concentration due to a limited number of firms and substitutes, with an inverse relationship observed between concentration and economic size**⁴².

Furthermore, analysis by Nes et al. (2021) highlights cross-country and cross-sectoral differences in margins. The wholesale sector records the lowest average margins (between 5% and 10%), followed by retail (between 6% and 17%). **Food processing registers the highest average margins**, ranging from 15% to 42%. **The manufacturing sector also displays the widest dispersion, implying significant heterogeneity of market power across firms**, in contrast to retail and wholesale. In addition to having the lowest margins, the wholesale sector also exhibits a higher share of loss-making firms **compared to other sectors**⁴³.

Overall, however, there is limited empirical evidence to support the hypothesis of a widespread increase in market power across the food supply chain. One possible explanation is that buyer power within the value chain constitutes only a minor concern, as the structural weakness of certain market actors may be shaped by a range of additional factors. In such cases, insufficient competition might be a misperception, while the actual challenges are more likely the result of a combination of multiple economic drivers⁴⁴.

⁴¹ Nes, K. - Colen, L. - Ciaian, P. (2021). „Market Power in Food Industry in Selected EU Member States“.

⁴² European Commission (2024). „Protecting competition in a changing world - Evidence on the evolution of competition in the EU during the past 25 years“.

⁴³ Nes, K. - Colen, L. - Ciaian, P. (2021). „Market Power in Food Industry in Selected EU Member States“.

⁴⁴ Deconinck, K. (2021). „Concentration and market power in the food chain“.

Box 4 – Definition of concentration indicators

1. Concentration ratio

The CR_n index represents the percentage of turnover accounted for by the n largest firms within a defined market segment and can be expressed using the following formula:

$$CR_n = \sum_{i=1}^n MarketShare_i \quad (1)$$

assuming,

$$MarketShare = \frac{Revenues_i}{\sum_j^N Revenues_j} * 100 \quad (2)$$

where,

N denotes the total number of firms within the segment

i represents the rank of a firm, ordered according to its revenue volume

The CR_n index generally expresses the percentage share of turnover accounted for by the n largest firms within a given market segment. A higher CR_n value indicates greater market concentration. The most commonly used variant is the CR₄ index, which measures the share of sectoral turnover attributed to the four largest firms in a given economic segment. This index was employed to estimate market concentration within the slovak food value chain. It should be noted, however, that concentration measures do not account for the broader structure of a sector beyond the specified number of largest firms. To provide a more comprehensive view of sectoral structure, the analysis is complemented by CR₁ and CR₁₀ indices, which consider the market share of the leading firm and the ten largest firms, respectively.

In the context of EU competition policy, a firm with a market share below 40% is generally unlikely to be considered dominant under Article 102 of the Treaty on the Functioning of the European Union (TFEU). Conversely, a market share above this threshold indicates a potential for dominance. Accordingly, concentrated segments are specifically subdivided into those where CR₄ exceeds 60% and CR₁ exceeds 40%, representing concentrated markets with a potentially dominant firm⁴⁵.

Concentration levels are generally classified as follows:

- unconcentrated markets with value below 40%
- moderately concentrated markets with value between 40% and 60%
- highly concentrated markets with value over 60%

2. HHI

Unlike CR_n, **the Herfindahl-Hirschman Index (HHI) accounts for the distribution of all firms within an economic sector** and is defined by the following formula:

⁴⁵ European Commission (2024). „Protecting competition in a changing world - Evidence on the evolution of competition in the EU during the past 25 years“.

$$HHI = \sum_{i=1}^N MarketShare_i^2 \quad (3)$$

Because the HHI assigns greater weight to larger firms, it is often considered a superior indicator of market power⁴⁶. The HHI ranges from 0 to 10,000, with 0 representing perfect competition and 10,000 representing a monopoly. According to the United States Department of Justice⁴⁷, an economic segment is classified as:

- unconcentrated with value below 1 500
- moderately concentrated with value between 1 500 and 2 500
- highly concentrated with value over 2 500

Both HHI and CR indices implicitly assume that higher concentration increases the ability of firms to exert market power. However, sectoral concentration may not always perfectly reflect market power⁴⁸. First, the accuracy of concentration measures depends on correctly defining the economic segment, which can be challenging for agricultural products that are perishable, bulky, or difficult to transport. In such cases, producers may face greater purchasing power than suggested by national concentration indicators such as CR or HHI. Second, in sectors where established firms face new entrants, competition may remain robust despite high concentration⁴⁹. Nevertheless, when used alongside additional evidence, concentration indicators provide useful guidance for identifying firms with potential market power.

3. Margin estimations

Unlike concentration indices, the margin indicator reflects a firm's pricing power. **In perfectly competitive markets, prices equal marginal costs**, so any deviation may indicate market power. Another measure of potential market power is the price-cost margin, as developed by De Loecker and Warzynski (2012).

The formula is as follows:

$$Margin = \frac{Price_i}{Marginal\ costs_i} \quad (4)$$

Estimating margins for individual food products is challenging, given the multiple cost factors influencing final prices. Therefore, sector-level gross and profit margins are calculated using data from the Slovak Registry of Financial Statements, where gross margin represents the ratio of gross value added (GVA) to total firm turnover and profit margin represents the ratio of earnings before tax (EBT) to total firm turnover. The equation can be expressed as follows:

⁴⁶ Sexton, R. J. (2012). „Market power, misconceptions, and modern agricultural markets“.

⁴⁷ United States Department of Justice and Federal Trade Commission. (2010). „Horizontal Merger Guidelines“.

⁴⁸ Nes, K. - Colen, L. - Ciaian, P. (2021). „Market Power in Food Industry in Selected EU Member States“.

⁴⁹ Deconinck, K. (2021). „Concentration and market power in the food chain“.

$$Gross\ margin = \frac{\sum_{j=1}^N Gross\ Value\ Added_j}{\sum_{j=1}^N Revenues_j} * 100 \quad (5)$$

$$Profit\ margin = \frac{\sum_{j=1}^N Earnings\ Before\ Tax_j}{\sum_{j=1}^N Revenues_j} * 100 \quad (6)$$

In Section 3.1, Sectoral Concentration, CR4, CR1, and CR10 indices are used to provide an overview of market share distribution among the largest firms and to assess concentration levels in the analyzed economic segments. The analysis is complemented by the HHI, which considers the market shares of all domestic firms within each sector, not only the largest entities. Finally, margin trends and their distribution across market shares are examined, allowing a more precise assessment of the impact of concentration on sectoral and firm-level economic outcomes within the respective segments.

2.2 Investments and subsidies

The relationship between competition and innovation typically follows an inverted U-shape. While strong competition stimulates innovation, the division of the market structure into technological leaders and lagging firms reflects divergent incentives to innovate. The most technologically advanced firms gain a competitive edge that limits rivalry and reduces innovation incentives among less productive competitors⁵⁰.

Changes in competitive intensity may also stem from rising investments in intangible assets, which tend to be concentrated in large firms. Such assets—including software and research and development—require substantial upfront costs, thereby contributing to higher market concentration and shifting market shares toward larger players. OECD analysis indicates that **investment, particularly in intangible assets, is positively correlated with profit margins and concentration, especially among the most productive firms**⁵¹.

At the same time, firms invest to achieve lower marginal production costs through the adoption of new technologies. This process can generate greater economies of scale, lower consumer prices, and, ultimately, increased welfare gains. Investment thus plays a pivotal role in enhancing efficiency throughout the entire production chain, from primary agriculture to final consumer sales⁵².

In Slovakia, investment levels in agriculture and food manufacturing are broadly in line with the EU average (see Figure 13). However, **addressing the existing investment gap would require above-average levels of capital formation.** The slovak wholesale and retail trade sectors show even weaker performance, with investment levels falling below the EU average. Substantial variation exists across sectors: agriculture records an average investment rate of approximately 30%, the manufacturing sector around 20%, whereas in retail and wholesale trade, investment remains at single-digit levels, reflecting significantly lower investment needs in these activities.

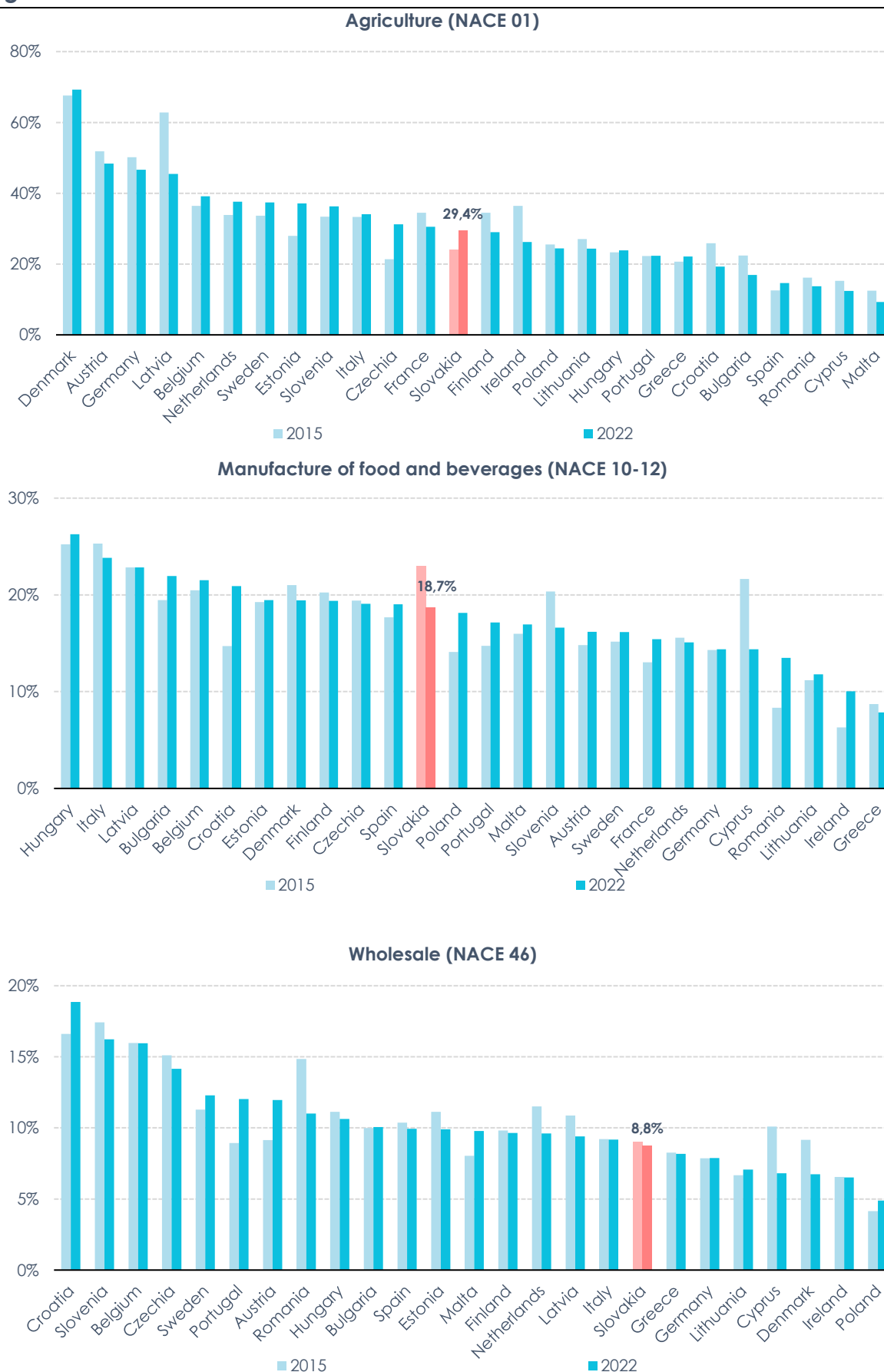
Strengthening the investment rate should be regarded as a key pillar for enhancing the competitiveness of slovak agri-food producers. The relatively low value-added content of production in several sectors constrains the capacity to generate savings that could be reinvested. Given that greater support for investment activity contributes to improving the overall business environment, it is essential to prioritise measures aimed at boosting productivity, fostering innovation, and improving the efficiency of production processes. Such measures would strengthen the competitiveness of enterprises across all segments of the food value chain.

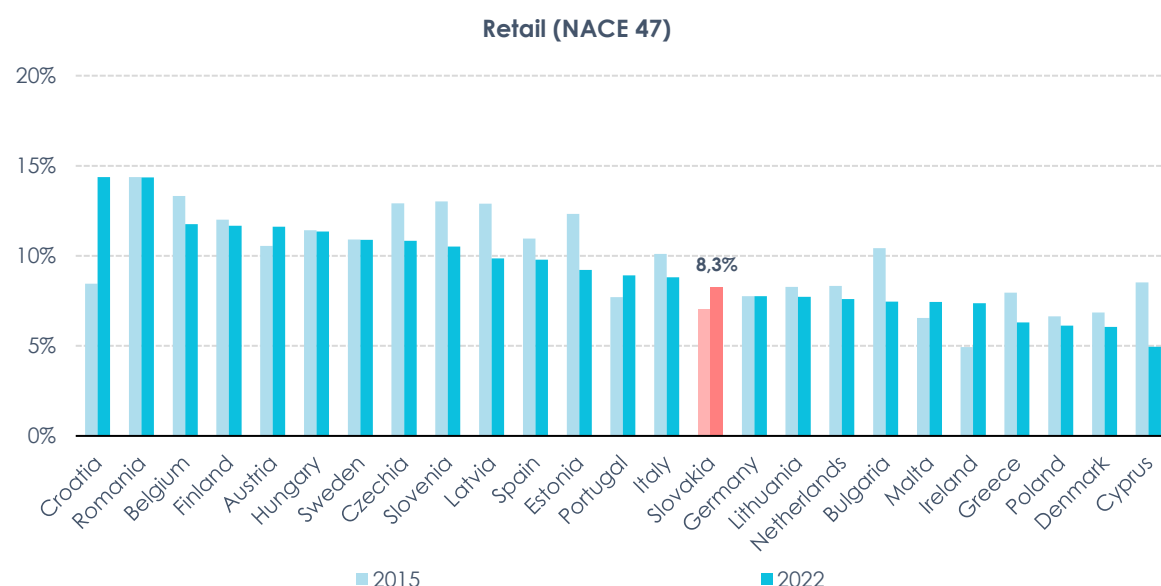
⁵⁰ Aghion, P. - Bloom, N. - Blundell, R. - Griffith, R. - Howitt, P. (2005). Competition and innovation: An inverted-U relationship

⁵¹ OECD (2024). „Monopolisation, moat building and entrenchment strategies“.

⁵² De Loecker, J. - Eeckhout, J. - Unger, G. (2020). „The rise of market power and the macroeconomic implications“.

Figure 13 - Low investment rates in food sectors fail to reduce investment debt



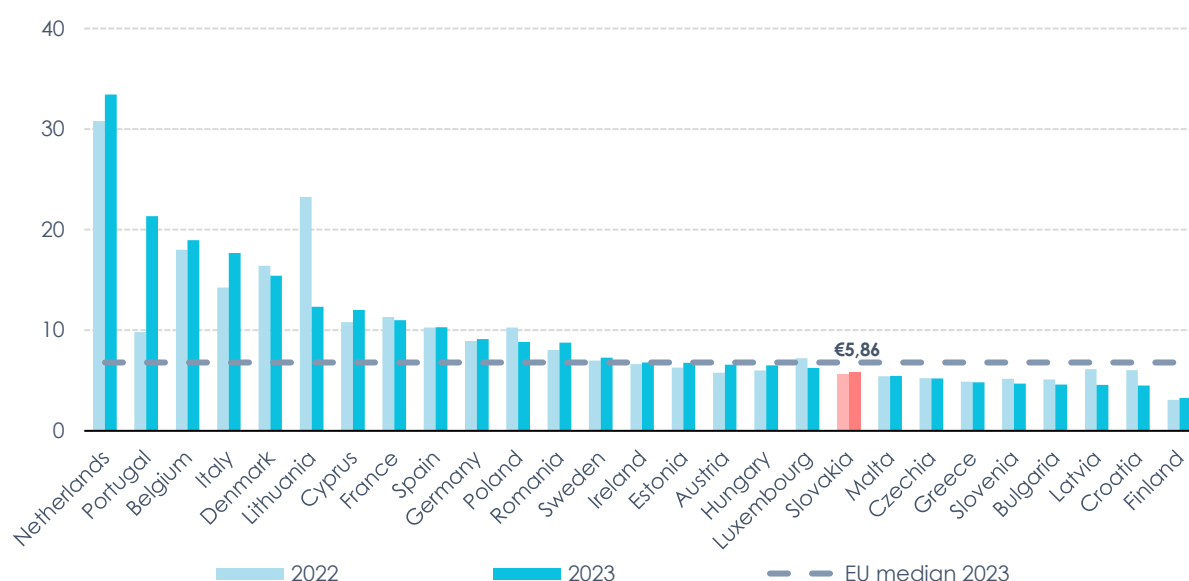


Source: Author's own calculations based on data from the Eurostat database (nama_10_a64, data updated on 24/09/2024)

Enhancing the stability of domestic production is often cited as a rationale for government initiatives aimed at supporting and subsidising agricultural activity. Many countries provide substantial assistance to offset input costs in agricultural production, reflecting the fact that domestic input prices frequently exceed international benchmarks. **To maintain the price competitiveness of domestic agricultural production, which is burdened by high costs, governments resort to subsidy schemes and support mechanisms designed to compensate for these cost differentials.** In Slovakia, financial resources used in agriculture are not exclusively of national origin. A significant share of funding is provided by the European Union through the Common Agricultural Policy (CAP). However, the attainment of the desired outcomes depends on ensuring that these funds are allocated in an effective and targeted manner.

The productivity of agricultural subsidies in Slovakia remains below the EU median (see Figure 14). Slovakia's performance in this area is broadly comparable to that of Czechia, Austria, and Hungary, yet considerable scope for improvement remains. By contrast, Poland and several economically more advanced Western European countries achieve substantially higher levels of subsidy efficiency.

Figure 14 - Government subsidies to agriculture remain inefficient



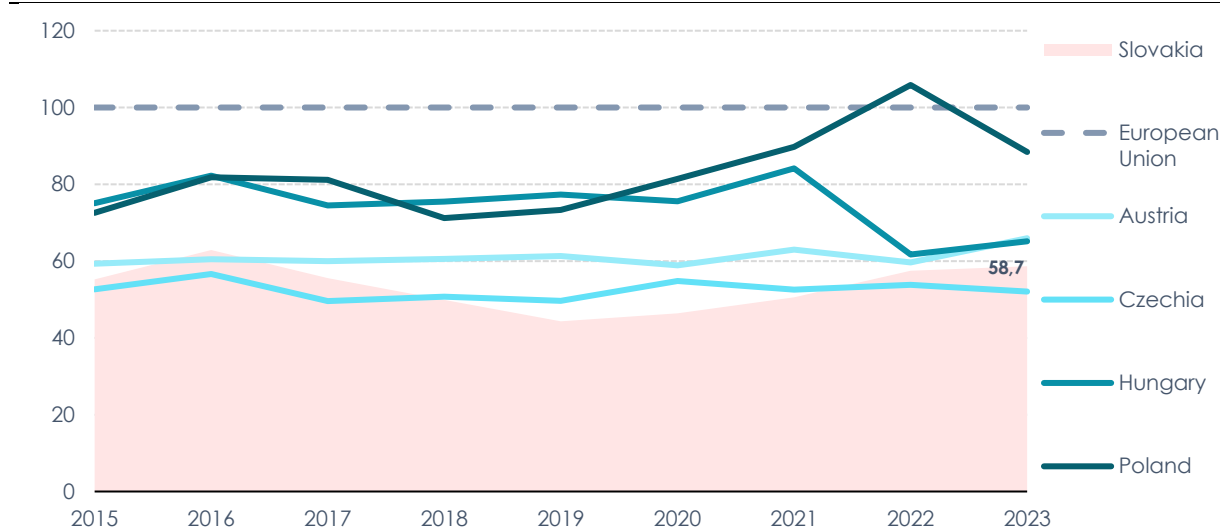
Note: The government subsidy productivity indicator expresses the ratio of gross value added to total government subsidies in current prices

Source: Author's own calculations based on data from the Eurostat database (aact_eaa)

Subsidy absorption efficiency in Slovakia has long stagnated, reaching only around 60% of the EU average (see Figure 15). This low efficiency contributes to widening productivity gaps between slovak agriculture and the more advanced EU economies. It is therefore essential to implement measures that improve the effectiveness of subsidy use, thereby strengthening the competitiveness of slovak farmers and contributing to the more stable and sustainable development of the sector as a whole. Optimising the allocation of public resources and prioritising innovation support could represent key steps towards improving this situation.

When interpreting the indicator of subsidy absorption efficiency, it is necessary to highlight several methodological limitations. First, available data often fail to capture the structure of support. **Different forms of subsidies generate distinct effects on productivity and overall sectoral performance, which may significantly influence the interpretation of the indicator as a whole.** Furthermore, cross-country comparisons of efficiency expressed in current prices, without taking into account differences in price levels and purchasing power, may lead to biased conclusions. The same nominal subsidy may carry very different economic weight in economies with high versus low purchasing power parity. For this reason, the indicator of efficiency should be regarded primarily as indicative and particularly suitable for monitoring trends over time, rather than as an absolute measure of efficiency across countries.

Figure 15 - Slovak farmers struggle with ineffective use of government subsidies

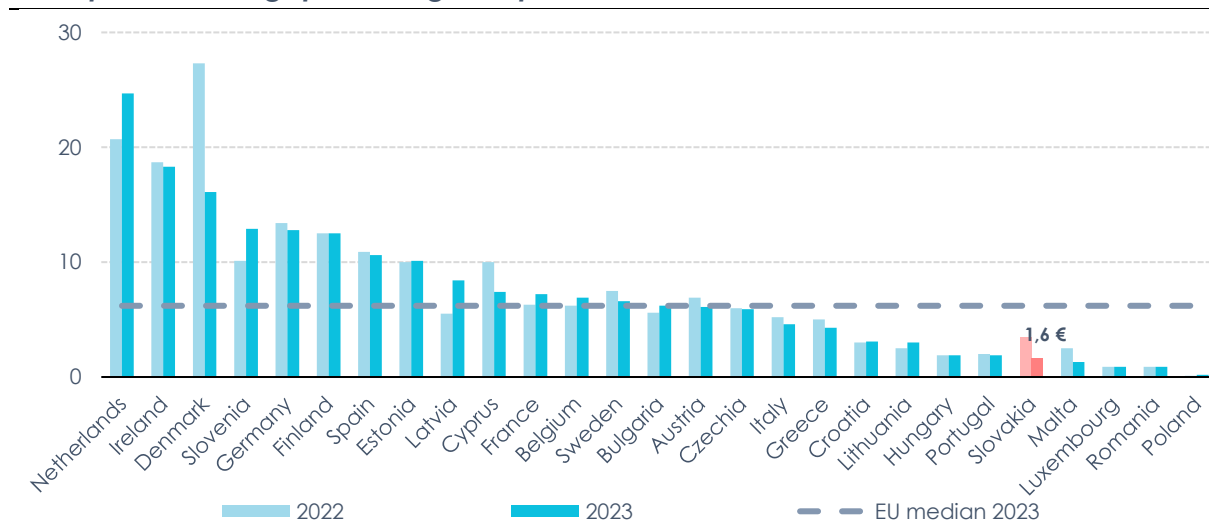


Note: The government subsidy productivity indicator expresses the ratio of gross value added to total government subsidies at current prices

Source: Author's own calculations based on data from the Eurostat database (aact_eaa)

A further concern relates to the pronounced disparities in financial resources devoted to agricultural research and development (R&D). **Innovations**, capability of generating higher added value and boosting overall productivity, **remain insufficiently supported in Slovakia**. This shortcoming is evident in per capita R&D expenditure, where Slovakia ranks among the lowest in the EU. In 2023, median per capita R&D spending in the EU reached 6,2 euros (see Figure 16). In contrast, Slovakia allocated only 3,4 euros per capita in 2022, and by 2023, **this amount had fallen to less than half of that already low level, representing just one quarter of the EU median**. This adverse trend is not new, even prior to 2022, Slovakia's support for agricultural R&D had not reached significantly higher levels.

Figure 16 - Government support for research and development reveals competitiveness gaps among european farmers



Note: Values of government support for R&D are expressed in current prices per capita

Source: Eurostat database (sdg_02_30, data updated on 05/08/2024)

Investments play a crucial role in enhancing the competitiveness of the agri-food sector, as they enable technological modernisation, improvements in production efficiency, and the promotion of innovation. Through investment, enterprises can increase the added value of their products, reduce production costs, and respond more effectively to market demands, thereby strengthening their competitive position both domestically and internationally. **In Slovakia, however, the agri-food industry has long suffered from an investment deficit, which has negatively affected its overall performance. Low levels of financing for research and development, outdated technologies, and weak innovation support contribute to the sector's lagging position compared to more advanced EU economies.**

In both slovak agriculture and food manufacturing, this investment shortfall has accumulated over the long term, manifesting in technological obsolescence, a low rate of capital stock renewal, and limited capacity to adopt new technologies. While direct quantification of the total investment gap remains challenging due to the lack of statistical data on required investment volumes, **indirect evidence can be found in the sector's persistently low labour productivity.** Whereas western European countries have experienced significant productivity gains in recent decades, driven by digitalisation, automation, and substantial investment in research and development, Slovakia's agri-food sector has recorded only modest improvements. These disparities reflect not only lower levels of investment but also reduced investment efficiency, which further exacerbates the existing investment gap.

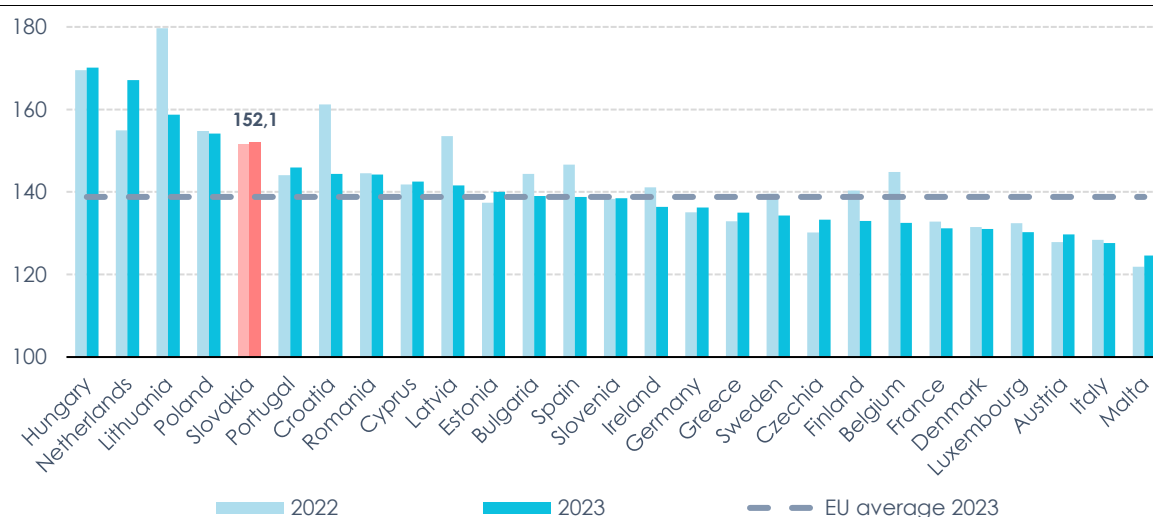
2.3 Inputs to production

In advanced industries and mature markets, the productivity of production factors plays a decisive role in generating value added. However, **where value added grows more slowly than turnover, sectors become increasingly reliant on inputs, heightening their dependency.** Such conditions can adversely affect profit margins, as sharp increases in input costs are passed on to consumers through higher prices.

OECD analysis indicates that sectors with higher dependence on regulated inputs, such as energy, tend to exhibit greater concentration, lower margins, and higher product prices.⁵³ This phenomenon can be explained by the ability of larger enterprises to manage elevated costs more effectively, either through operational efficiency or by diversifying input sources. **The rapid increase in food prices between 2022 and 2024 was driven primarily by cost and production shocks**, including rising prices of food commodities, fertilisers, and energy.

Production costs in Slovakia's food sectors remain elevated and continue to rise, in contrast to developments in most other EU countries. The increase in input prices on international markets led to a cumulative rise in the price level of agricultural production inputs in Slovakia of more than 52% since 2020, representing the fifth-highest value among EU Member States in 2023 (see Figure 17). Despite a modest year-on-year decline in the EU average input price level (–1,3 p.p.), no such adjustment occurred in Slovakia. On the contrary, in 2023 input prices in primary production rose by 0,6 p.p. compared to the previous year.

Figure 17 - Agricultural input prices in Slovakia rose faster than in majority of EU countries



Note: The price level is represented by the price index at current prices with a base year of 2020

Source: Eurostat database (agri_pi15_ina, data updated on 19/10/2024)

According to Eurostat, the increase in production costs in Slovakia in 2023 was most significantly affected by the surge in energy prices (79,5% year-on-year surge) and

⁵³ OECD (2024). „Competition in the Food Supply Chain“.

animal feed (43,5%). **The cumulative rise in energy prices in Slovakia between 2020 and 2023 reached 123%**, the highest value in the region and nearly double the EU average of 63,7%. By contrast, these categories recorded a slight decline in 2023 at the EU level, while the price levels of most other input categories largely stagnated. The persistently high overall input price index in Slovakia was primarily sustained by the rising cost of seeds and planting stock, which increased by 8,2% (see Annex 4).

Energy input prices for slovak enterprises continued to grow in 2023, despite falling prices on international markets. Electricity prices in Slovakia ranked among the highest in the EU, with only Hungary and Cyprus recording higher levels (see Figure 18). In the case of natural gas, another key input in food production, prices in Slovakia also exceeded the EU average. It should be noted that while most European countries experienced a decline in domestic energy prices in line with reductions in wholesale market prices, this trend did not materialise in Slovakia.

Figure 18 - Slovak companies face among the highest energy prices in the EU



Note: The values represent the selling prices of energy for firms converted to kWh

Source: Author's own calculations based on data from the Eurostat database (nrg_pc_203_c, nrg_pc_205_c, data updated on 29/07/2024)

The rise in energy prices has had a pronounced impact in Slovakia, as farmers and producers across the entire value chain display a comparatively high share of intermediate consumption (particularly energy inputs) in production relative to neighbouring countries. This situation exposes slovak producers to greater risks in the event of supply shocks or sudden increases in production costs. At the same time, it constrains the capacity to generate value added, thereby undermining the competitiveness of slovak producers. Equally important is the international dimension, particularly in the context of diversifying imported production inputs, especially energy. **Insufficient diversification may jeopardise competitiveness, as well as the sustainability and resilience of the agri-food sector, in the event of sharp price increases or disruptions in the supply of production factors.**

In 2022, the intensity of intermediate consumption increased across all stages of the agri-food value chain compared to 2015. The change in the share of intermediate consumption in Slovakia during the observed period ranged from 3,6 percentage points in the food and beverages sector to 9,2 percentage points in agriculture (see Figure 19). It is particularly concerning that the share of intermediate consumption in output continues to rise despite already being relatively high at the beginning of the period. This raises questions about the maximum level this share might reach, thereby fuelling concerns regarding the ability of slovak agri-food sectors to generate sufficient levels of value added.

In 2022, the intensity of intermediate consumption in most slovak sectors reached high levels compared to neighbouring countries. These values are particularly pronounced in the manufacturing industry, where low value added is a structural characteristic. The greatest potential to reduce intermediate consumption intensity thus lies in primary production and in service sectors such as wholesale and retail trade.

Although certain shifts in the share of intermediate consumption were also observed in the agri-food sectors of neighbouring countries, these changes, either upward or downward, were not as pronounced as in Slovakia. Austria represents a notable exception, as no significant increase in the share of intermediate consumption in output was recorded. **Higher levels of value added in Austria are likely the result of higher productivity, more intensive investment, and better diversification of production inputs,** especially energy, during periods of cost shocks.

Energy inputs were the key driver of changes in intermediate consumption shares. In 2022, the overall share of energy inputs in Slovakia's agri-food sectors reached the highest level in the region. All stages of the agri-food value chain recorded a marked increase in the share of energy inputs. The most substantial increase occurred in the retail sector, where the share of energy inputs in total output rose from 1,8% to 4,8%. A significant increase in the intensity of energy inputs was also recorded in agriculture, which contributed substantially to the overall rise in intermediate consumption to nearly 50%. While the impact of energy price shocks was felt across all neighbouring countries, Slovakia registered the most pronounced shift in values within the region.

Figure 19 - Input intensity has risen across food sectors, mainly due to highest energy consumption within the region



Note: Blue represents intermediate consumption intensity, while red represents energy intensity. Intensity indicator refers to the energy consumption to the total output of each sector

Source: Author's own calculations based on data from the FIGARO input-output tables

The above-mentioned factors directly affect the productivity of the production process, which can be expressed as input productivity, commonly referred to as total factor productivity (TFP). **The level of unit input productivity in Slovakia remains low, with the processing industry consistently recording the weakest results** (see Figure 20). Average productivity in this sector currently stands at 0,44 (normalised per unit of inputs). Lower productivity in the processing industry is not an exceptional phenomenon, as industrial sectors in general exhibit a limited capacity to generate value added. Nevertheless, the processing industry plays a crucial role in the economy, given that a broad spectrum of other economic activities depends on its output. Lower levels of value added in this sector are primarily driven by higher costs and greater volumes of production inputs and should therefore not be interpreted as an indicator of inefficiency. **While other segments of the agri-food value chain display**

higher productivity, their relative performance remains below that of neighbouring countries.

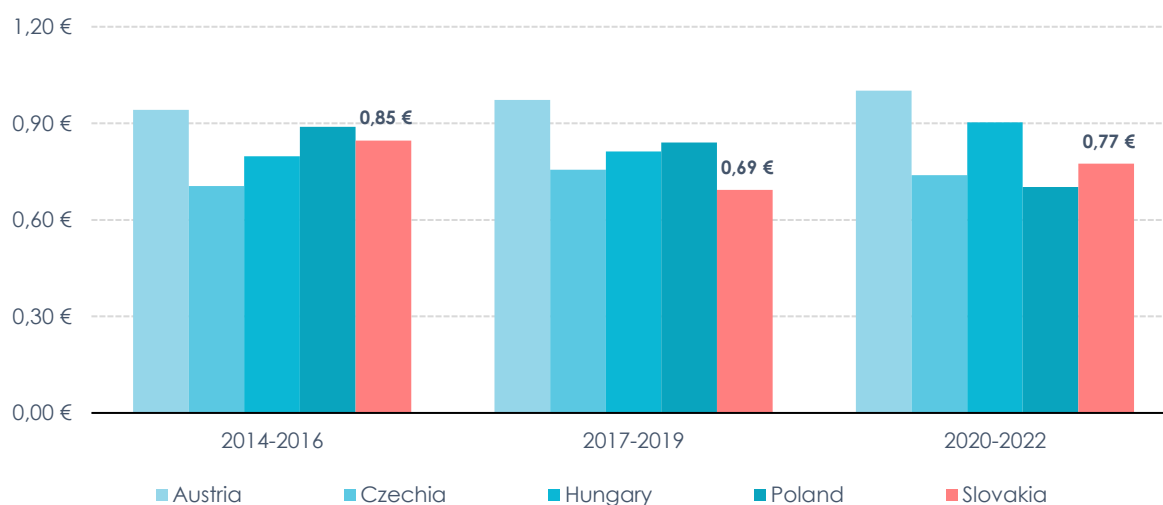
The capacity of individual sectors to generate value added varies considerably across countries. None of the observed countries consistently dominates productivity levels across all sectors. Current data show that Austria leads in wholesale and in the processing industry, Hungary in retail, and Poland in agriculture. However, it is essential to monitor differences in trend dynamics. **While Austria records growth or long-term stability in productivity, Slovakia has experienced a decline, or at best stagnation, in recent years.**

The limited capacity to generate value added highlights the increasing dependence of production on intermediate consumption, as well as the restricted ability to generate profits or savings necessary for investment in efficiency-enhancing improvements in agri-food production. Another adverse consequence of stagnating productivity is the reduced scope for wage growth, which may diminish the attractiveness of the sectors and lead to difficulties in securing required labour force.

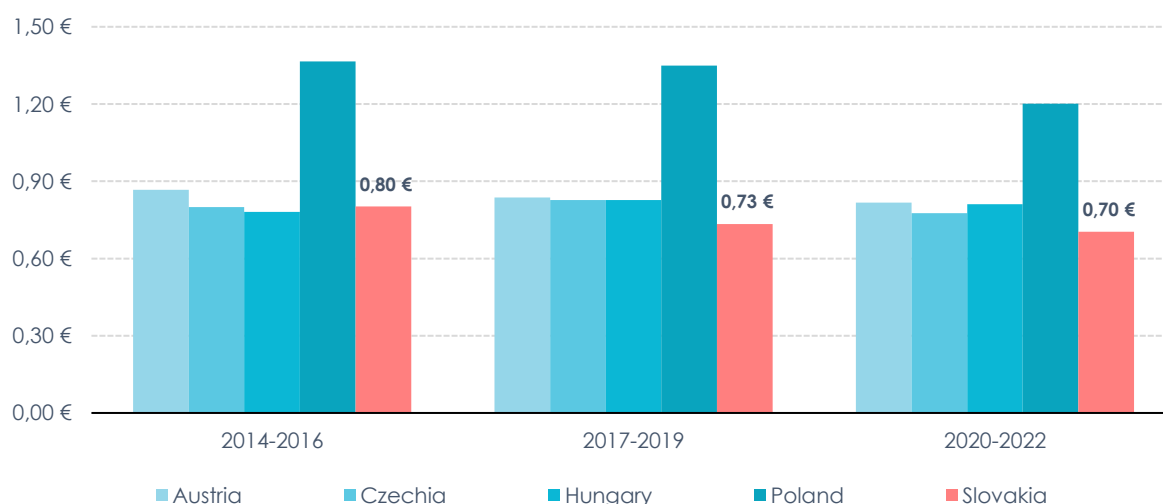
Figure 20 - Input productivity in slovak food sectors is stagnating or declining



Wholesale (NACE 46)



Retail (NACE 47)

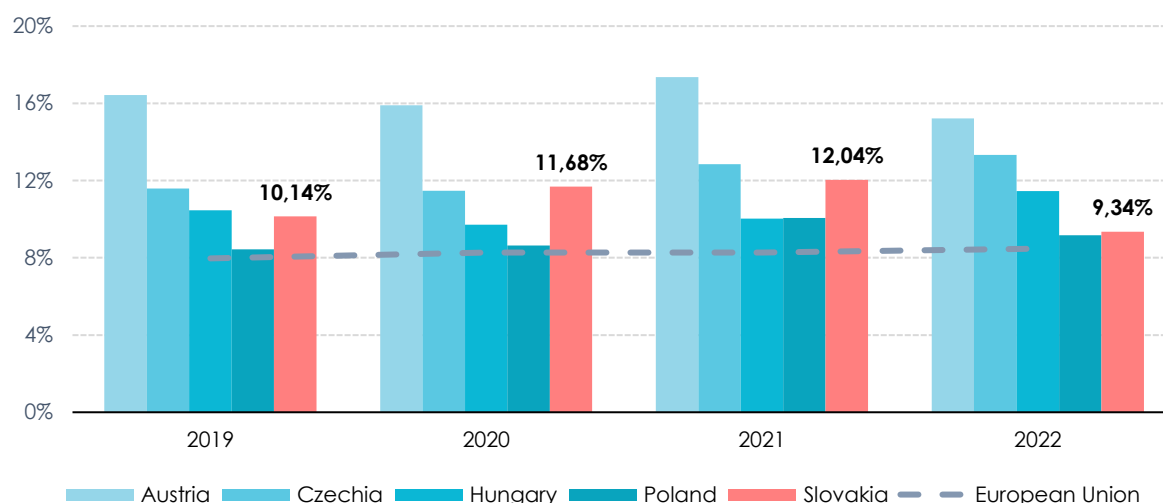


Note: The indicator expresses the gross value added normalised per unit of variable inputs. Variable input indicator refers to the sum of intermediate consumption and compensation of employees within the sector

Source: Author's own calculations based on data from the FIGARO input-output tables

One positive aspect of Slovakia's agri-food value chain is its environmental performance. The share of renewable energy in the slovak agri-food sectors is comparatively high. With the exception of 2022, when levels declined both in Slovakia and in neighbouring countries due to price shocks in energy markets, the slovak agri-food value chain maintained above-average shares, reaching almost 12% in 2021 (4 percentage points above EU average). Within the region, Austria leads with renewable energy shares ranging between 15% and 18% (see Figure 21). **The use of renewable energy sources is not only beneficial from an environmental perspective, but also enhances diversification of energy supply, thereby supporting the stability and resilience of agri-food production.**

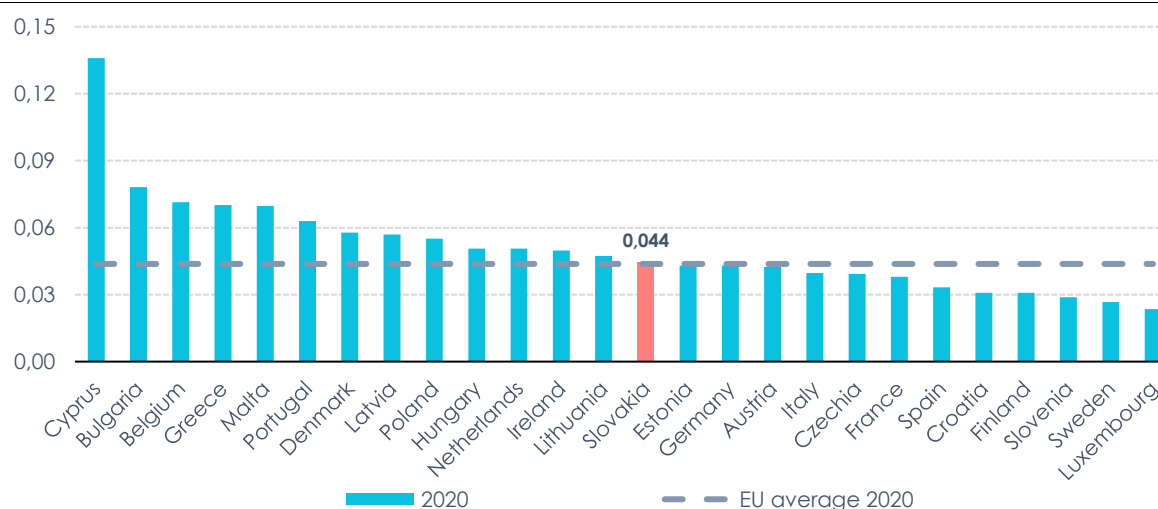
Figure 21 - The share of renewables in food sectors has decreased



Zdroj: Source: Author's own calculations based on data from the Eurostat database (nrg_cb_rw, data updated on 14/08/2024)

Another important dimension of environmental sustainability is the level of food waste generated along the value chain, from production to final consumption. When recalculated in terms of waste per unit of consumption, each euro spent on food generates 44 grams of waste across the entire agri-food chain, which corresponds to the EU average (see Figure 22). However, these figures may be biased, as they do not account for international trade, specifically the scale of exported production and imported food consumption. **Given the significantly higher share of household expenditure on food in Slovakia, reflecting relatively low purchasing power, reducing food waste represents an important avenue for alleviating the disproportionately high consumption burden.** More efficient management of food not only contributes to cost-effectiveness in consumption but also reduces environmental impacts and enhances the resilience of households to price shocks.

Figure 22 - Slovakia's food waste level reflects EU average



Source: Author's own calculations based on data from the Eurostat database (nrg_cb_rw, data updated on 14/08/2024)

2.4 Value added and labor productivity

Additional factors influencing the competitiveness of firms include labour productivity and the capacity to generate value added. **Labour productivity and value-added creation are key determinants of production competitiveness across all sectors**, including the food industry. Within the food value chain, these factors play a pivotal role in enhancing efficiency, product quality, and the sustainability of production.

Slovak food production, facing increasing competition in both domestic and international markets, must deploy resources efficiently and focus on maximising value added to maintain its market position. The capacity for efficient resource utilisation directly affects the level of margins, which serve as key indicators of value creation and firm profitability. **Higher labour productivity and increased value-added generation enable producers to optimise costs, thereby creating room for margin expansion without negatively affecting price competitiveness or market positioning.**

For international comparisons of margins in agriculture and food production sectors, national accounts methodologies are employed, as the collection of firm-level data across EU countries is highly challenging. The share of value added or operating surplus cannot be fully equated with the concept of margins, as their computation relies on data recorded in company financial statements (see Box 3). These statements include distinct indicators calculated using methodologies differing from the harmonised national accounts system. Nonetheless, these indicators provide valuable insights that, similar to margins, reflect the capacity of slovak food producers to create economic value and the efficiency of production processes. They also facilitate the positioning of slovak food sectors in an international context. A detailed calculation of sector-level margins based on slovak firm-level data is presented in Section 3.2, Margins and Profitability.

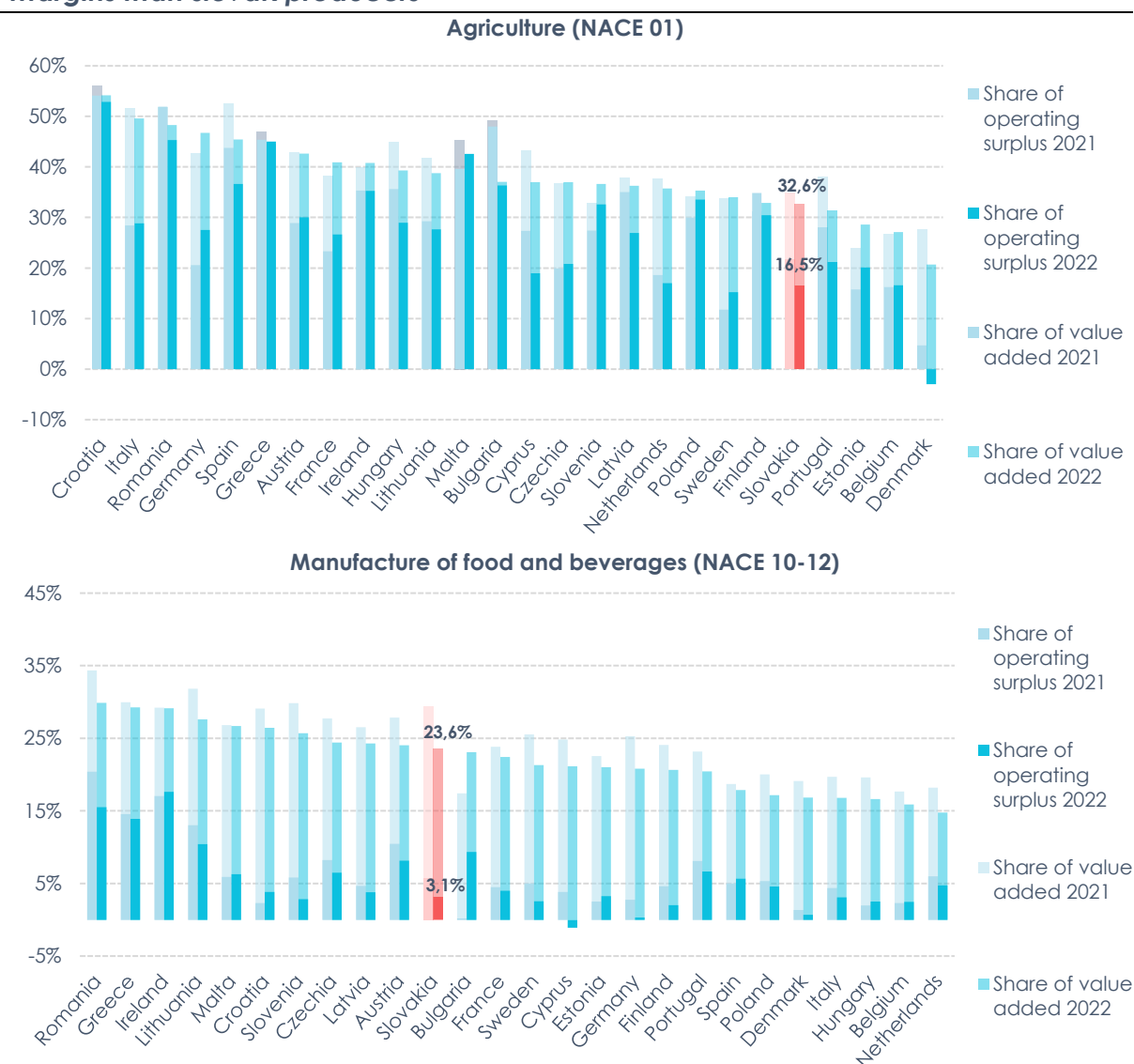
Based on Eurostat data, it can be noted that **margins in Slovakia's primary production and processing sectors were not disproportionately high compared to other EU countries** (see Figure 23). Gross margins in agriculture, expressed as the ratio of value added to total output, reached 34,8% and 32,6% in 2021 and 2022, respectively, placing them among the lowest in the EU. **Similarly, profitability, expressed as the ratio of operating surplus to output, remained below the EU median in both years**, at 21,6% in 2021 and declining to 16,5% in 2022.

It is important to emphasise that agriculture is a sector heavily dependent on government subsidies and various support schemes. These mechanisms compensate for differences in production costs to maintain sector competitiveness. **Consequently, in some countries, the share of operating surplus may exceed the share of value added, a phenomenon unusual in other sectors, as operating surplus typically constitutes only a portion of value added.** This indicates that the capacity for value creation in agriculture within the EU is strongly influenced by the level of subsidies, which vary significantly across Member States. Therefore, the efficiency of production in this sector cannot be evaluated independently of the scale of financial support received.

In the processing sectors, economic efficiency of production can be more clearly compared. **Gross margins in these sectors slightly exceeded the EU median in both years.** However, in 2022, a decline of 5,8 percentage points relative to the previous year was observed, indicating that **rising input costs during a period of food price increases reduced the share of value added. This trend was observed across most EU countries**, except Bulgaria, leading to a decline in the EU median from 25,1% to 21,9%. **In addition, the share of operating surplus relative to output also decreased, suggesting that food processors had to absorb higher costs from their profits.** This decline was observed in Slovakia as well as in most EU countries, with the slovak operating surplus ratio falling from 5,7% in 2021 to 3,1% in 2022.

It should be emphasised that, in contrast to gross margins, the share of profits relative to output in the slovak processing sector remains below the EU median. **The larger gap between operating surplus and value added indicates that slovak food producers likely face higher operating costs compared with foreign competitors.** These costs constrain the capacity to generate profits and savings, which over the long term translates into insufficient investment and reduced expected economic surpluses, further resulting in stagnation of economic activity and a loss of international competitiveness.

Figure 23 - During the inflation peak, european competitors mostly achieved higher margins than slovak producers



Source: Author's own calculations based on data from the Eurostat database (nama_10_a64, data updated on 11/11/2024)

The share of wages in gross value added, which remained relatively stable throughout much of the twentieth century and accounted for a significant portion of variable production costs, has experienced a marked decline since 2000. This trend reflects a structural shift in cost composition, characterized by a reallocation of expenditure from labour to capital, i.e., from variable to fixed costs⁵⁴. This structural transformation has significant implications for the interpretation of corporate economic performance. In particular, **increases in profit margins do not necessarily translate into higher net profits, as net profit represents revenues after deduction of all costs, including variable costs such as wages and material inputs, as well as fixed capital costs such as depreciation and interest.**

⁵⁴ European Commission (2024). „Protecting competition in a changing world - Evidence on the evolution of competition in the EU during the past 25 years“.

Recent research indicates, however, that firms tend to retain a substantial portion of cost savings derived from lower marginal costs and convert them into higher profit shares. Consequently, **the ratio of net profit to total output has been rising over the long term, a development closely associated with the declining share of wages.** This dynamic suggests that capital-intensive production and cost optimisation exert a strong influence on corporate financial outcomes, while simultaneously raising questions regarding the equitable distribution of economic value between capital and labour⁵⁵.

In the slovak food sector, no trend of a declining wage share is observed. On the contrary, particularly in agriculture and, to a lesser extent, in processing sectors, the share of employee compensation in value added remains relatively high. In the processing industry, slovak values are broadly in line with the EU average (56,7% in 2021), whereas in agriculture the share reaches 43,5%, representing the fourth-highest value in the EU (see Figure 24). **The higher percentage share of wages in value added in the processing industry, compared with agriculture, primarily reflects the lower level of value added generated in the sector rather than higher wage levels.** Countries with high wage shares in both sectors include Denmark, Estonia, Latvia, and Germany. These countries, together with Slovakia, generate relatively low value added in relation to wage costs, which has negative long-term implications.

A high share of employee compensation in value added may indicate low efficiency in the utilisation of human resources and limited labour productivity, negatively affecting firms' capacity to generate savings for future investment and constraining profit potential. Nevertheless, **a high wage share is not inherently a negative indicator. Ideally, it reflects a highly skilled workforce and a transition towards a knowledge-based economy with higher value added. Problems arise, however, when wages grow faster than labour productivity, as is currently the case in the slovak food sector.** Here, the wage share increases primarily because value added grows slowly while wages rise more rapidly, posing a long-term risk to sectoral competitiveness. In contrast, countries such as Greece, Romania, Ireland, and Austria exhibit low wage shares, indicative of higher labour productivity and greater specialisation in food production. These factors create more favourable conditions for the expected development of these sectors.

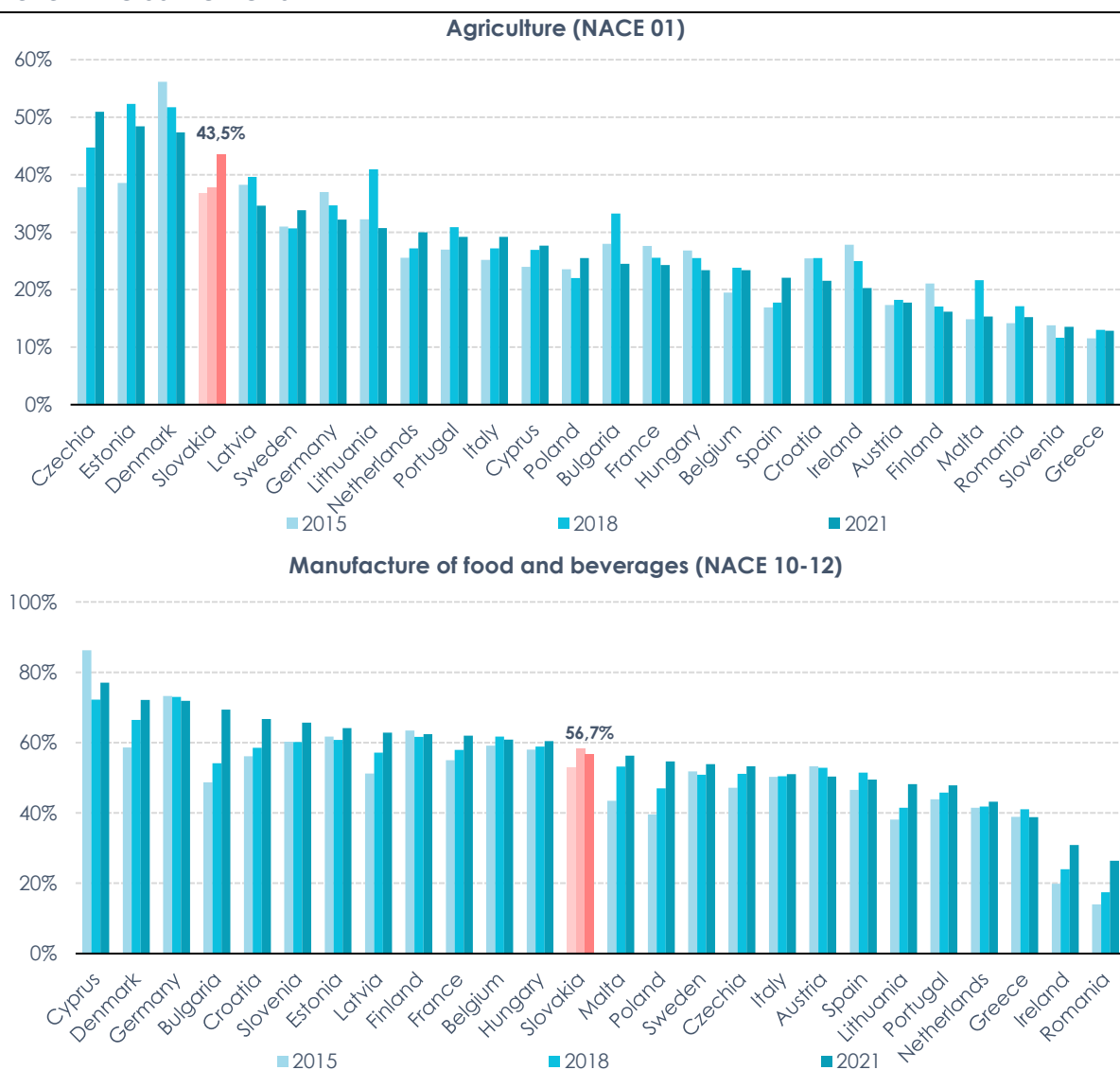
In Slovakia, the wage share has been rising over the long term, signalling declining labour productivity. The growth of value added has not been sufficient to offset the rise in wages, raising concerns regarding the future viability of the food sector. **This production inefficiency translates into higher production costs, which undermine international competitiveness.** Moreover, the sector loses attractiveness for the labour force relative to other industries if it cannot generate sufficient value added to cover wage costs. In agriculture, the wage share increased from 36,8% in 2015 to 43% in 2021. In the processing sector, the increase was more moderate, from just under 53% to

⁵⁵ Barkai, S. (2020). „Declining labor and capital shares“.

56,7%. Unlike in agriculture, the trend of increasing wage shares in the processing industry is observed in most EU Member States.

Finally, certain methodological considerations must be taken into account when interpreting the wage share in value added. **In the agriculture and food sectors, a significant number of self-employed individuals receive remuneration that is recorded not as wages but as part of what is termed mixed income. This may lead to an underestimation of the actual wage share.** Inclusion of these individuals would likely result in an even higher share of labour costs. The indicator may also be affected by the prevalence of alternative forms of employment, such as agency work or informal agreements, which are not reflected in official statistics. These factors highlight certain limitations that should be considered when conducting international comparisons and evaluating trends in wage-related indicators over time.

Figure 24 - Employee compensation in agriculture is high, manufacturing seems to follow the same trend



Source: Author's own calculations based on data from the Eurostat database (nama_10_a64, data updated on 11/11/2024)

According to the European Commission, the workforce within the food value chain is gradually ageing, and attracting highly skilled labour with competencies appropriate for this sector is becoming increasingly challenging. **Many individuals prefer employment in better-paid and more attractive sectors**⁵⁶. From an economic theory perspective, a decline in labour supply directly affects its price, i.e., wage levels. **When the available labour force decreases while demand remains unchanged, wages naturally tend to rise.** This phenomenon contributes to an increase in the share of labour costs and simultaneously to a decline in labour productivity, negatively impacting corporate financial performance.

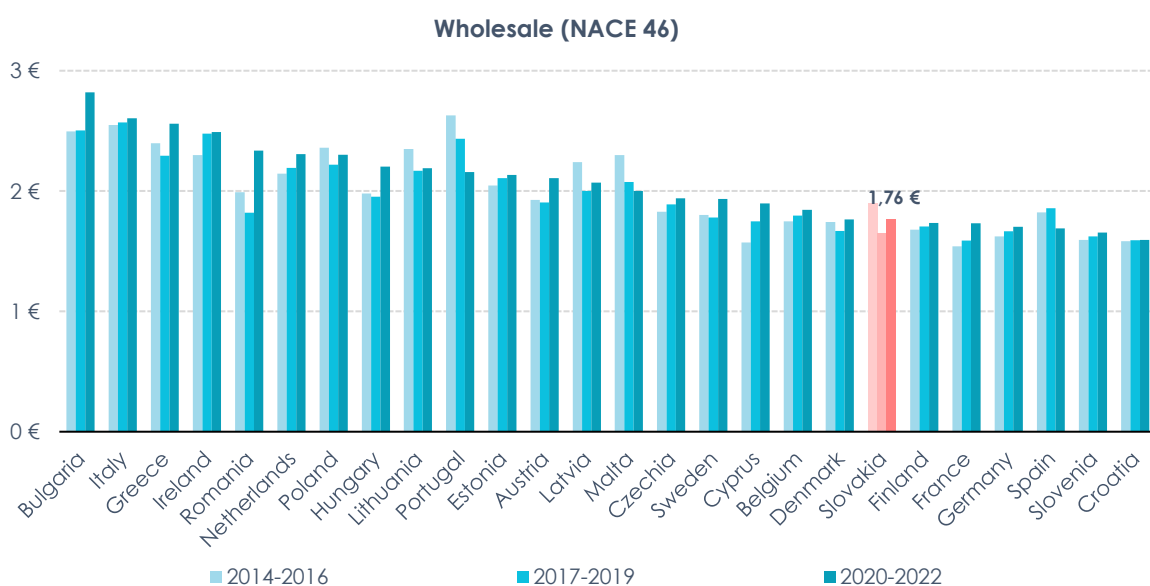
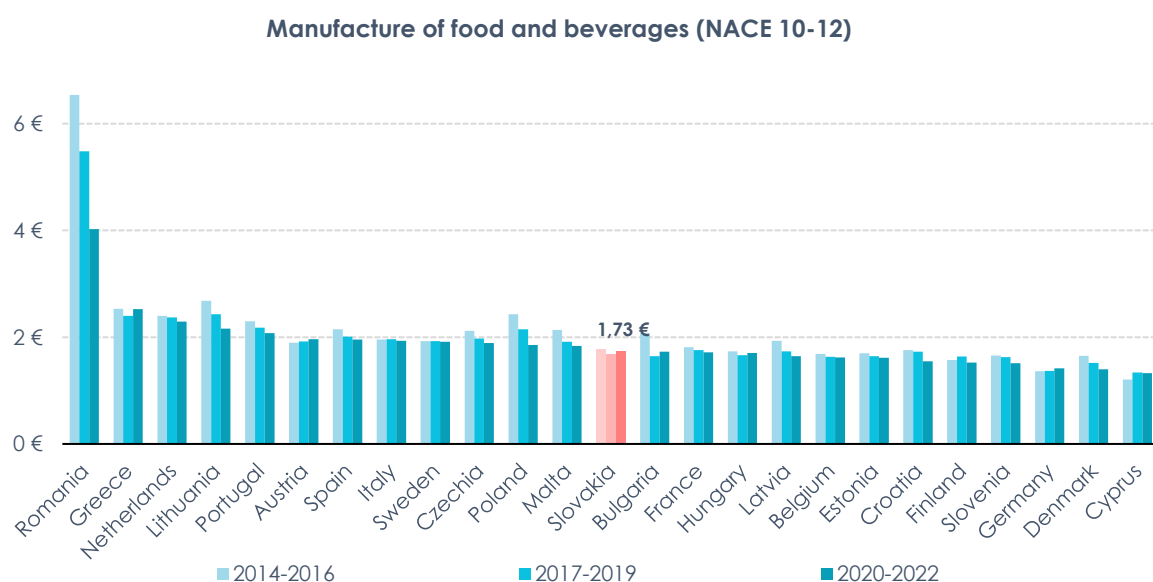
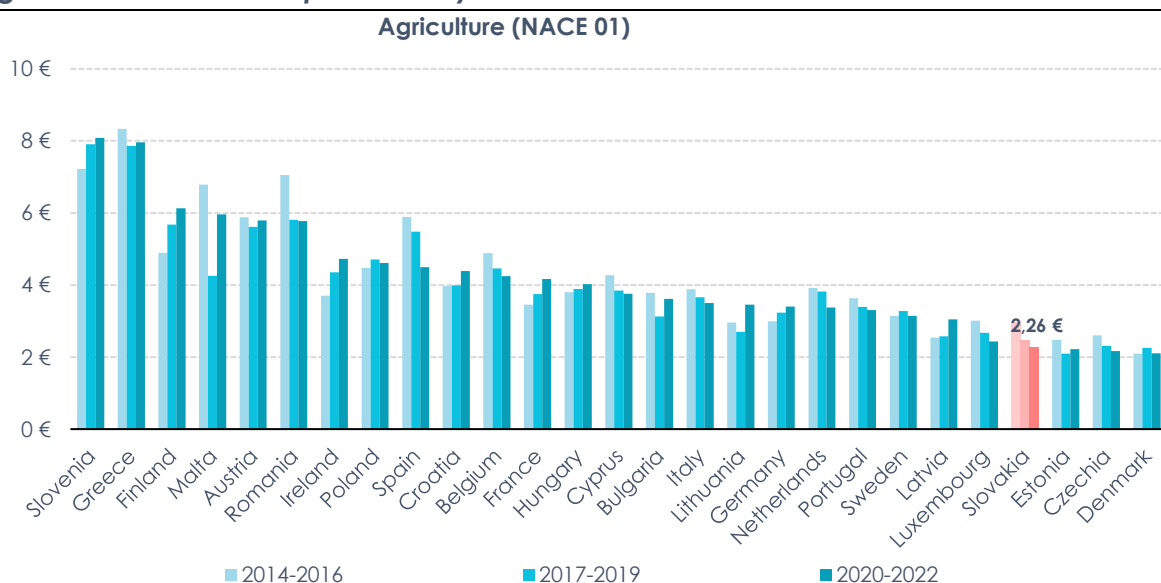
A comparison of average unit labour productivity across EU Member States reveals low efficiency in the utilisation of human resources at all levels of the slovak food value chain (see Figure 25). **The highest average standardised labour productivity between 2020 and 2022 was observed in agriculture. However, its value has been gradually declining.** While the average labour productivity in this period approached three euros per unit, the current level has fallen to 2,26 euros, placing Slovakia among the EU countries with the lowest agricultural labour productivity.

Similarly low values are observed in the retail and wholesale sectors. **Service sectors in Slovakia exhibit significant lagging in labour productivity compared with other EU countries.** Average value added per unit of labour between 2020 and 2022 reached 1,76 euros in wholesale and 1,48 euros in retail. Countries with low unit labour productivity, such as Germany, Denmark, and France, simultaneously incur high labour costs relative to the value added generated. **This suggests that high labour costs may constrain resources available for innovation, which could improve the efficiency of the entire food value chain.** In Slovakia, the situation is particularly problematic, as sectors are largely unable to sufficiently increase labour productivity. **Wage growth frequently outpaces the growth of value added, reducing sectoral competitiveness.**

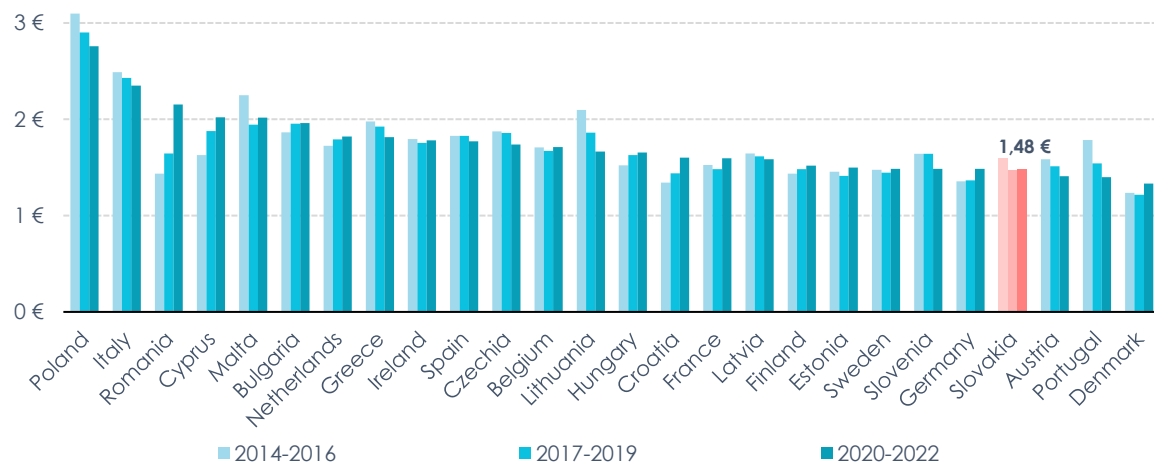
The only sectors demonstrating unit labour productivity levels comparable with European competitors are the processing sectors. Although their average labour productivity is lower than in agriculture or wholesale, due to a higher proportion of other production inputs, it remains within the range of European averages (spanning 1,33 to 2,52 euros), excluding the outlier represented by Romania. Between 2020 and 2022, the average unit labour productivity in these sectors was 1,73 euros, with values remaining largely stagnant over the long term.

⁵⁶ European Commission (2014). „Innovation Union competitiveness report 2013“.

Figure 25 - Weak labor productivity limits rise of value added in food sectors



Retail (NACE 47)



Note: The unit labour productivity indicator expresses the amount of value added per unit of compensation of employees. It is the reciprocal value of the unit-labour-costs indicator

Source: Author's own calculations based on data from the Eurostat database (nama_10_a64, data updated on 11/11/2024)

The slovak food industry faces a persistent challenge of low labour utilisation efficiency relative to foreign competitors and other domestic economic sectors. This inefficiency translates into higher labour costs, which subsequently reduce profit margins and constrain value-added creation. **As a result, the sector's capacity to generate sufficient resources for reinvestment is limited, impeding further development.** Insufficient investment leads to lower labour productivity and restricted production capacity in slovak food enterprises compared with international competitors, increasing their vulnerability to global market pressures.

Relatively lower productivity, combined with high labour costs, results in higher production costs, making slovak products more expensive than foreign alternatives. This cyclical pattern of low efficiency, limited investment, and diminished international competitiveness presents a critical challenge for the future development of the slovak food industry. **Without the implementation of innovation, technological modernisation, and more effective utilisation of human capital, the sector will continue to lag behind international competitors, potentially resulting in a gradual loss of market share.**

2.5 Production capacity and foreign trade

Foreign trade in food products represents a key indicator of the international competitiveness of the slovak food industry. **Globalisation and international integration offer new opportunities but also present challenges that influence the positioning of slovak producers in foreign markets.** However, recent disruptions in global supply chains, linked to the COVID-19 pandemic and geopolitical conflicts, have weakened this position. Rapidly rising prices of energy inputs and raw materials have been transmitted across all components of the consumer basket, pushing inflation to historically high double-digit levels and generating additional pressures on maintaining competitiveness. **The development of foreign trade in Slovakia, encompassing both overall trade and the agri-food sector, exhibits parallel trends.** Both segments have recorded double-digit growth in exports and imports, with the overall volume of foreign trade demonstrating long-term growth⁵⁷.

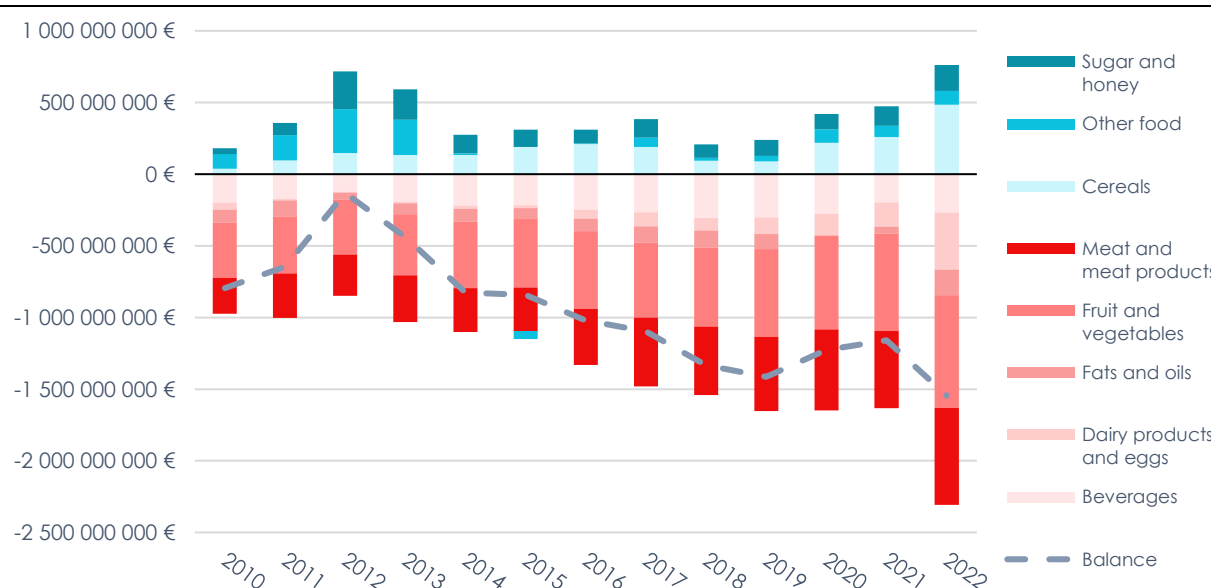
In contrast to overall trade, the food category has shown an increasingly negative trade balance. Between 2010 and 2022, the nominal trade deficit in food more than doubled, reflecting deepening challenges in domestic production and the competitiveness of the slovak agri-food sector (see Figure 26).

This growing deficit is closely linked to the performance of slovak food production, which has long faced structural challenges such as low self-sufficiency, dependence on imported key raw materials, and insufficient investment in innovation and the modernisation of production capacities. Relative to the gross value added generated in agriculture and the manufacture of food and beverages, the contribution of the negative trade balance increased from 40% to 44,7% in 2022. The contribution reached its minimum in 2019, when the deficit represented 49,2% of gross value added. **This trajectory suggests that, while slight improvements occurred in certain years, the long-term trend remains unfavourable.**

The largest contributors to the food trade deficit are categories such as fruit and vegetables, meat and meat products. In 2022, this was compounded by a sharp increase in the deficit for dairy products and eggs. Conversely, Slovakia has consistently been a net exporter in categories such as sugar and honey, as well as cereals. **Notably, in 2022, cereal net exports grew by 87% year-on-year due to the Russian aggression against Ukraine, which constrained supply and drove substantial price increases on international markets.**

⁵⁷ Ministry of Agriculture and Rural Development of the Slovak republic (2023). „Report on Agriculture and Food Sector in the Slovak Republic for 2022“.

Figure 26 - Slovakia's trade deficit deepens, mostly driven by fruit, vegetables and meat imports



Note: The value of foreign trade is expressed in current prices

Source: Author's own calculations based on data from the FAOstat database

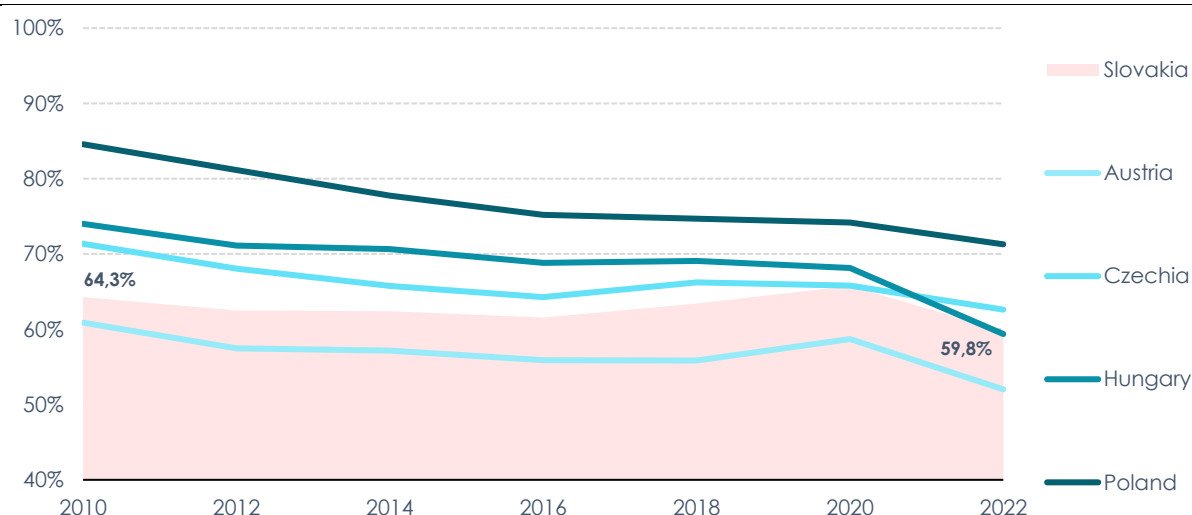
From the perspective of agri-food trade, Slovakia faces significant challenges regarding specialisation, which is crucial for enhancing competitiveness. Export growth driven primarily by rising commodity prices indicates a weak orientation towards the production of higher value-added food products as opposed to raw commodities. Food categories with higher value added have shown a long-term deepening of the negative trade balance. The structure of exports and imports reveals a higher share of primary production in exports and a corresponding higher share of processed foods in imports (see Annex 5). This imbalance highlights the need for strategic adjustments in the food sector. **Slovak producers should focus on developing higher value-added food products, which can improve competitiveness and reduce the negative trade balance. Specialisation in international trade enables more efficient resource utilisation, increased productivity, and the production of higher-value products.** Identifying areas where Slovakia can effectively compete on the global market, while optimising production structures, is essential for the long-term sustainability of the sector.

However, increasing food exports should not compromise Slovakia's food self-sufficiency. Export growth must be pursued in a sustainable manner, aligned with strategic objectives to strengthen domestic production and the stability of the agri-food sector. **Slovak households consume a significant proportion of goods and services imported from abroad. This is particularly evident in the food sector, where the high share of imported consumption strongly influences domestic price levels.** Domestic factors have minimal impact on imported food prices; thus, price levels are primarily determined by foreign supply. In 2022, only 59% of food and non-alcoholic beverage consumption originated from domestic production (see Figure 27).

Paradoxically, lower food self-sufficiency in Slovakia provided certain advantages during the peak of the inflationary shock. **Imports acted as a moderating factor on prices, as domestic food prices were rising more sharply.** Long-term food self-sufficiency has hovered around 60%, and this level does not currently appear critical. Comparisons with neighbouring countries are instructive, **While in 2010 most neighbouring countries, except Austria, exhibited higher food self-sufficiency, by 2022 the differences had narrowed.** In all comparator countries, unlike Slovakia, self-sufficiency experienced a significant decline, whereas Slovakia maintained relatively stable levels.

Nevertheless, risks remain associated with low self-sufficiency. **Possible vulnerability is hidden in the limited availability of food in case of supply shocks or adverse external factors**, such as climate change, poor harvests, or non-compliance with food safety standards. Under such conditions, access to essential food products may be jeopardised, potentially driving prices upward and increasing the burden on Slovak households. Consequently, **it is essential for Slovakia to strengthen its food self-sufficiency in the long term.** This entails investing in domestic agriculture, enhancing production efficiency, and promoting the production of higher value-added food products. Strengthening domestic production and optimising the structure of imports can significantly reduce the country's vulnerability to external shocks and ensure a more stable and accessible food supply for households.

Figure 27 – Food import dependence is rising in Slovakia, but self-sufficiency declining across the region



Note: Food self-sufficiency refers to the share of domestic food production in final food consumption of households

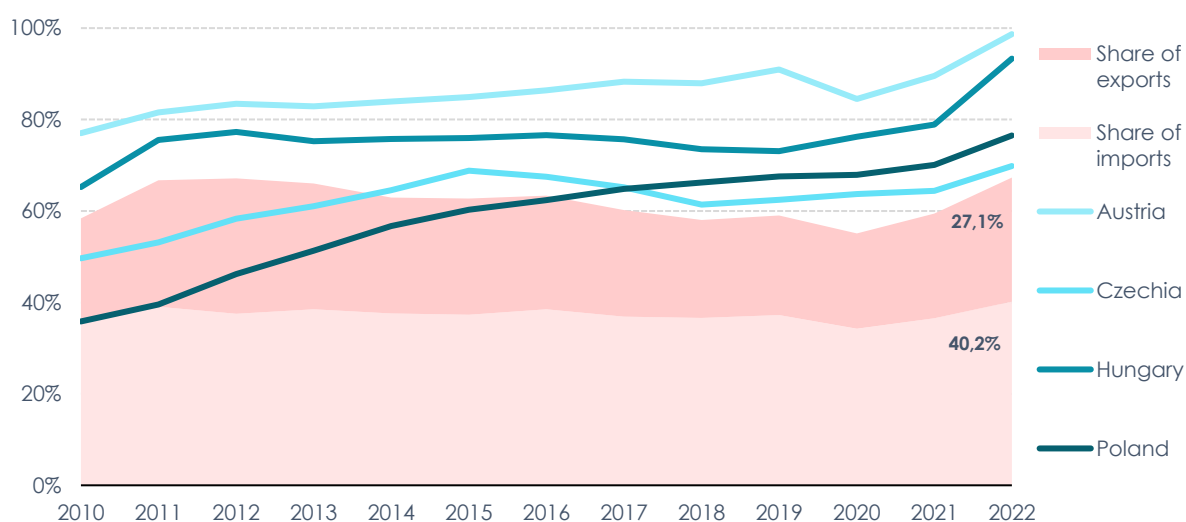
Source: Author's own calculations based on data from the Eurostat database (hbs_exp_t121, ds-018995)

A declining level of food self-sufficiency may, however, indicate a shift towards greater specialisation in selected food categories in which the country can achieve a comparative advantage. This process can lead to higher productivity and increased value added through the efficient utilisation of economies of scale. On the other hand, such specialisation may result in shortages in certain domestic food categories that

must be supplemented through imports. **It is expected that exports of products in which the economy specialises should compensate for the trade balance deficit.** However, if the pace of export growth does not increase, low levels of food self-sufficiency reflect insufficient international competitiveness of the sector. This issue is illustrated by the development of foreign trade, which shows stagnating exports relative to rising imports (see Figure 28).

In Slovakia, the balance between imports and exports relative to food consumption does not converge. This phenomenon reflects low specialisation and weak competitiveness of domestic production. Food trade flows are predominantly driven by rising imports, while export values have remained largely unchanged over the long term. In contrast, neighbouring countries have experienced more pronounced export growth that outpaces import growth, enabling higher productivity and enhanced competitiveness in selected agri-food sectors.

Figure 28 - Weak export performance highlights low competitiveness of slovak producers



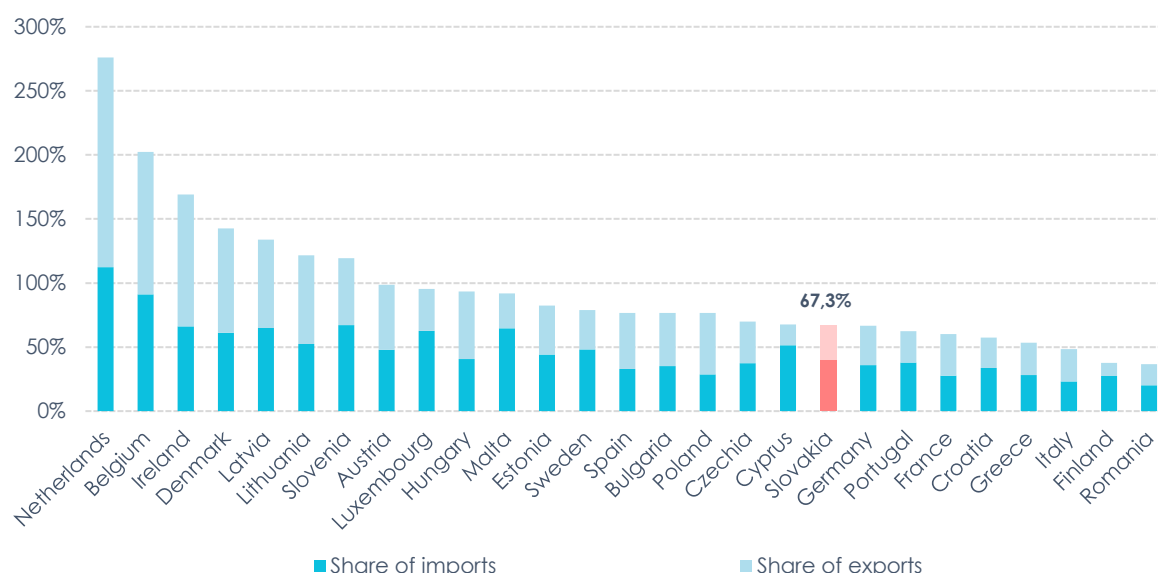
Note: The food vertical openness indicator expresses the share of the food imports and exports in final food consumption of households

Source: Author's own calculations based on data from the Eurostat database (hbs_exp_t121, ds-018995)

Greater market openness, measured by the sum of imports and exports, presents certain advantages. It provides consumers with a wider range of substitute products, which can lead to lower prices, improved availability, and higher product quality. At the same time, higher market openness does not automatically translate into more efficient, export-oriented production. Large economies, such as Italy, Germany, and France, have sufficiently large domestic markets to meet demand with domestic production. These countries exhibit lower levels of imports and exports because domestic competition is capable of efficiently satisfying demand (see Figure 29). Conversely, smaller economies, such as Austria, Slovenia, and the Baltic States, display higher market openness. This openness is often associated with specialisation in selected sectors where high efficiency is achieved.

Despite its relatively small size, Slovakia exhibits lower market openness and a high share of imports, indicating weak international competitiveness. If Slovakia were to pursue more intensive specialisation in selected agri-food sectors and increase the share of exported production, domestic consumers could benefit from more efficient production supported by international trade.

Figure 29 - Slovakia's food market remains relatively closed compared to its size



Note: The food vertical openness indicator expresses the share of the food imports and exports in final food consumption of households

Source: Author's own calculations based on data from the Eurostat database (hbs_exp_t121, ds-018995)

Another notable feature of Slovakia's foreign trade is the high concentration of trade flows within EU member states, which account for over 90% of the country's total trade in agricultural and food products. More than 85% of this volume is directed towards the ten most significant trading partners (see Annex 6). This concentration is influenced not only by geographical proximity but also by the nature of food products as perishable goods with limited shelf life, subject to stringent food safety and logistical standards.

However, low specialisation and production efficiency negatively affect the export competitiveness of slovak food producers. This challenge is reflected in rising domestic production prices, which in recent years have exceeded the cost of imported products. The slovak agri-food sector also faces additional structural constraints, including low labour productivity, insufficient capital endowment, limited investment, and suboptimal utilisation of available resources. These factors contribute to a substantial production gap, reducing the sector's ability to meet domestic consumption needs and increasing reliance on imports.

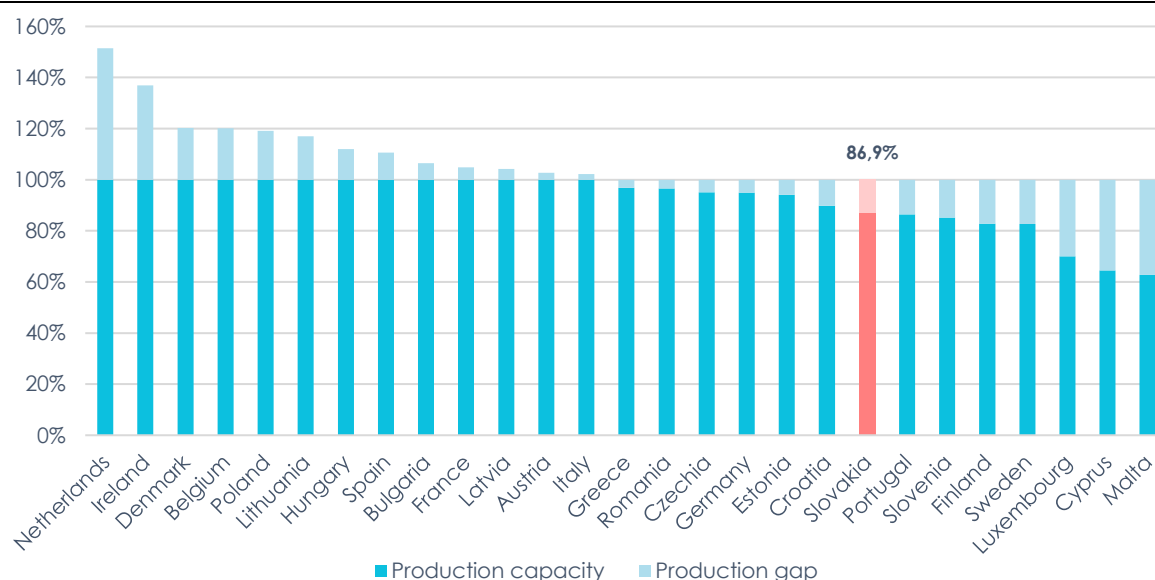
Production capacity, measured as the total volume the sector is capable of producing, **represents a key indicator of the performance of the food industry. This indicator reflects not only the level of self-sufficiency and food availability but also the**

number of active enterprises and the utilisation of physical and human capital to generate value added. Unlike the food self-sufficiency indicator, which accounts only for domestic production consumed within the country, production capacity captures the full scope of domestic output, including goods intended for export. A limitation, however, is that it assesses sectoral performance as a whole without reflecting the composition of individual food products.

Currently, slovak production covers only 87% of household consumption, placing Slovakia among the countries with the lowest food self-sufficiency in the EU. The remaining 13% of consumption must therefore be imported, even assuming that all exported production remains within the domestic economy (see Figure 30). **Compared with neighbouring countries, Slovakia's production capacity relative to consumption is the lowest.** Only the Czech Republic exhibits a comparable production gap, whereas other neighbouring countries produce beyond their domestic consumption, indicating higher export competitiveness and more efficient resource utilisation at lower production costs.

Slovakia's low production capacity has a significant impact on price formation, as dependence on imports increases consumer sensitivity to external factors, such as international price fluctuations or adverse climatic conditions. Foreign producers additionally benefit from lower production costs resulting from higher efficiency and specialisation. **This reliance on external suppliers heightens the risk of price shocks, particularly in the absence of domestic substitutes, which could compromise food availability in crisis situations.**

Figure 30 - Food production capacity cannot meet domestic household demand



Note: The production capacity indicator expresses the share of total domestic production (including exports) in final food consumption of households

Source: Author's own calculations based on data from the Eurostat database (hbs_exp_t121, ds-018995)

A country's production capacity is closely linked to the effectiveness of government subsidies and the level of investment in research and development. Countries such as the Netherlands, Ireland, and Denmark consistently rank highly in these indicators, allowing them to optimise production and achieve high productivity. Slovakia should focus on improving the efficiency of subsidy utilisation and increasing investment in modernising the food sector. **Enhanced investment in research and development, technological innovation, and efficient management of public resources are essential measures to strengthen production capacity. Such actions would enable an increase in domestic production volumes, thereby improving household consumption coverage and reducing dependence on imports.**

3 Sectoral analysis of the slovak food vertical

The food sector in Slovakia plays a pivotal role not only in ensuring the availability of food for the population but also in generating value added for the national economy.

It constitutes an essential pillar of the economy, directly and indirectly influencing employment, regional development, and the overall stability of the domestic economy. The sector's dynamics are, however, conditioned by a range of factors, including the intensity of market competition, the structure of production costs, labour productivity, the efficiency of distribution chains, and price transmission mechanisms, which determine the extent to which changes in supply chain prices are reflected in final consumer prices. Consumer sensitivity to price fluctuations is also a critical factor, influencing demand for various categories of food products.

Accurate delineation of sectors and subsectors within the food value chain presents a methodological challenge. Divergent approaches to classification can yield differing results in the analysis of competition indicators.

Defining individual sectors represents the greatest challenge for assessing the state of market competition. According to the NACE classification of economic activities, certain sectors are included within the food industry even though they are not directly related to food production, processing, or distribution. For instance, the wholesale and retail trade sector (NACE G) encompasses activities involving the sale of non-food products, such as textiles, construction materials, or electronics.⁵⁸ For the purposes of this analysis, focus is placed exclusively on sectors directly linked to food production, distribution, and retail. This approach allows for a more precise monitoring of the food sector's dynamics, although results may not be fully comparable with studies that adopt a broader sectoral definition. A comprehensive list of the economic activities included in this analysis is provided in Annex 7.

Over the past decade, the slovak food value chain has recorded growth in nominal revenues, driven by a combination of rising domestic consumption and increasing price levels.

A more detailed examination of individual sectors reveals that revenue growth has not been homogeneous (see Figure 31). The retail sector exhibits long-term stable growth, whereas agriculture and food manufacturing face greater volatility, reflecting their higher sensitivity to both domestic and external economic factors. Between 2014 and 2023, the growth rate of revenues in the food manufacturing sector ranged from -1,86% to 21,43%, while the beverage manufacturing sector experienced a similarly wide range, from -6,88% to 16,96% (see Figure 32). In contrast, the retail sector demonstrated a more stable growth rate, ranging from 4,63% to 10,52%, highlighting its greater resilience to economic fluctuations. **From this perspective, retail**

⁵⁸ Eurostat (2008). „Statistical classification of economic activities in the European Community“

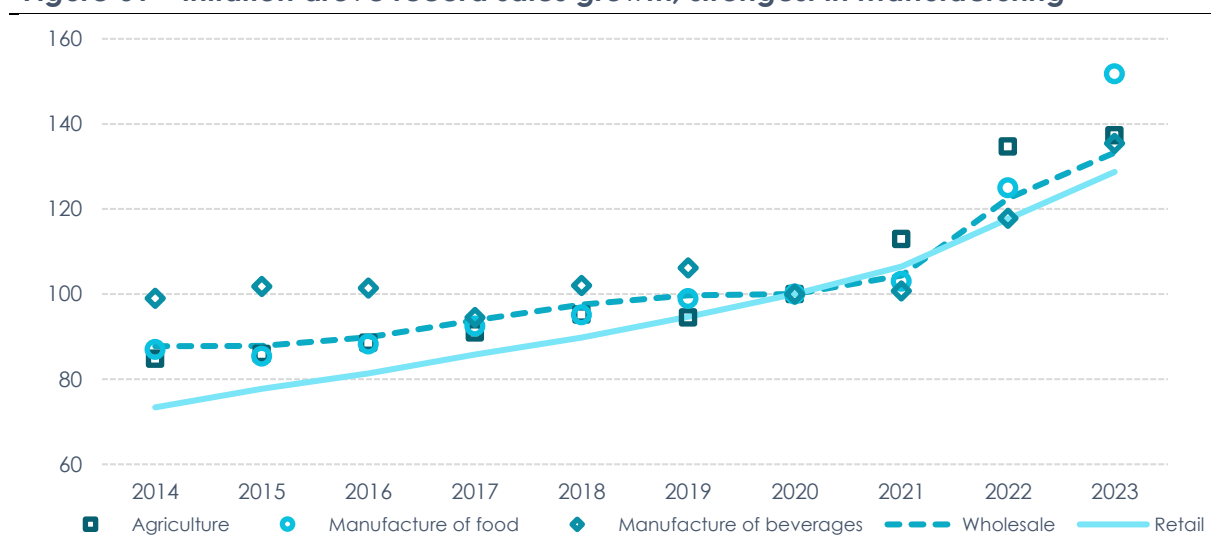
can be considered the most stable component of the food value chain, less affected by short-term economic shocks.

Revenue developments over the past decade can be divided into two key periods: the pre-COVID-19 period (2014–2020) and the post-pandemic period (2021–2023). **The pre-pandemic period was characterised by moderate growth, with the retail sector achieving the highest cumulative revenue increase of 36%.** Agriculture followed with an 18% growth, while the beverage manufacturing sector recorded only a minimal cumulative growth of 1%. This weak performance was primarily due to fluctuations in 2015, 2016, and 2019, which resulted in revenue declines or only modest recoveries.

A turning point occurred with the onset of the COVID-19 pandemic and the subsequent period of high inflation. Between 2021 and 2023, all sectors recorded record growth rates, with no year-on-year declines. **During this period, food manufacturers and agricultural producers surpassed previous records.** Revenues in food manufacturing increased by 51%, while agriculture grew by 37%. The year 2022 proved to be the most successful, with all sectors achieving double-digit revenue growth. It should be emphasised, however, that **this record growth largely reflected sharp price increases rather than necessarily higher efficiency or a substantial expansion in production.** In particular, in retail and wholesale, revenue growth did not fully align with price increases, suggesting that the **real performance of these sectors may have remained stable or even declined after adjusting for inflation.**

The future success of this sector will largely depend on its capacity to adapt to changing market conditions, increasing competition, and evolving consumer preferences. Innovation, improvements in production efficiency, and the strengthening of resilience to external shocks, such as economic crises or geopolitical events, will play a key role in ensuring sustained sectoral development.

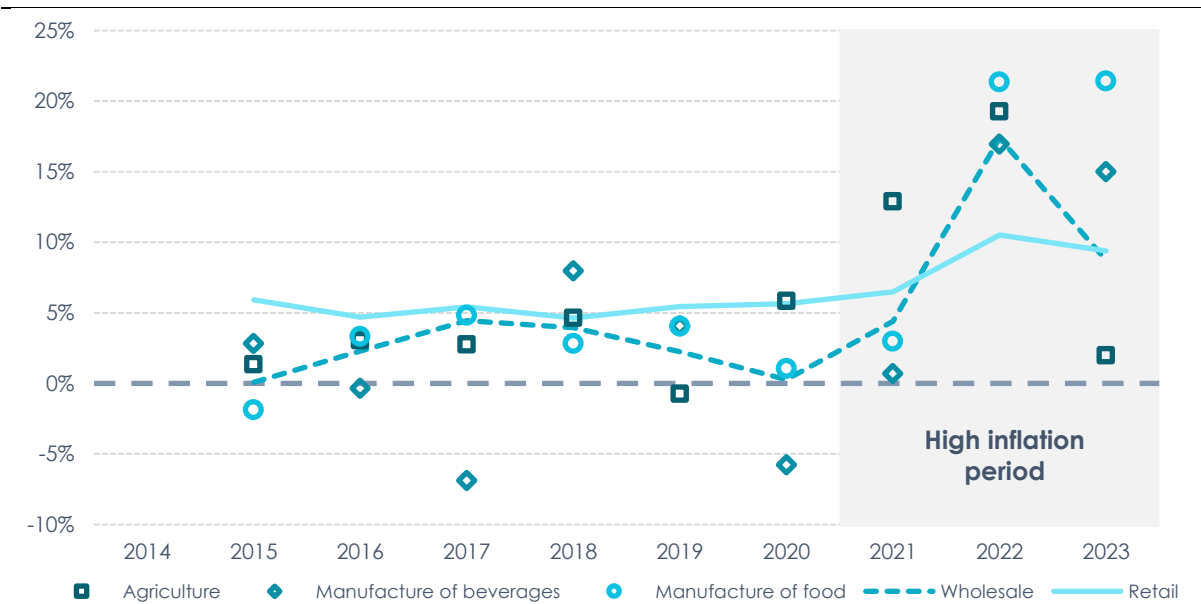
Figure 31 – Inflation drove record sales growth, strongest in manufacturing



Note: The value of total sales is expressed in current prices. The development of sales in the individual sectors of the food vertical is represented by an index with a base year of 2020

Source: Author's own calculations based on data from the Register of Financial Statements

Figure 32 – Retail trade shows steady growth, while other sectors remain vulnerable to shocks



Note: The value of total sales is expressed in current prices. The growth rate of sales reflects annual changes (YoY)

Source: Author's own calculations based on data from the Register of Financial Statements

According to the latest financial statement data, the largest sectors in terms of revenue are those located at the upper end of the food value chain (see Annex 8). In 2023, wholesale revenues exceeded 7,98 billion euros, while retail revenues surpassed 10 billion euros. That these sectors achieve the highest revenues is not surprising, as revenues as an economic indicator reflect not only sales volume but also the cumulative value added generated at lower stages of the food value chain, from primary agricultural production through processing to distribution and retail.

Within the retail sector, the most prominent sub-sector is Retail sale in non-specialized stores (NACE 47110), accounting for over 92% of total retail revenues. This sub-sector includes major retail chains, which play a key role in food distribution in Slovakia. **Retail chains are frequently the focus of public debate on pricing policies, given their significant influence on food price growth.** Their strong market position allows them to exert considerable bargaining power over suppliers and producers, effectively shaping final consumer prices. This phenomenon has substantial implications for the structure of the sector, as market power concentrated in the hands of a few large players can reduce competition, create barriers to entry for new firms in food retail, and influence the structure of all segments within the vertical chain. **The importance of this sub-sector is also reflected in analyses of sectoral concentration, as its share of total food chain revenues significantly affects the level of vertical concentration and, consequently, the dynamics of the competitive environment.**

In terms of revenue, following retail and wholesale sectors is the food manufacturing sector, which reached approximately 5,6 billion euros in 2023. This sector is characterised by high diversification, encompassing a broad range of industries with

varied production. The most significant industries in terms of revenue include following sub-sectors: Manufacture of dairy products (NACE 10510), Production of meat product (NACE 10130), and Manufacture of bread and pastrygoods (NACE 10710). These three industries accounted for over 40% of total revenues in the food manufacturing sector in 2023, highlighting their central role within the slovak food industry. At the other end of the spectrum, **the beverage manufacturing** sector generated revenues just above 1 billion euros, **representing the smallest sector in terms of revenue, number of active enterprises, and product diversity.** The sector has fewer defined sub-industries, resulting in lower diversification of production.

While revenue provides valuable information on the economic strength of individual sectors and their contribution to the final value of products, it does not reveal detailed information about the structural organisation of the sector. Revenue data do not account for the distribution of market power among firms, the level of competition, or the efficiency of resource allocation across segments. **To comprehensively understand the market power of economic entities, it is therefore necessary to analyse the structure of individual industries. This includes examining indicators such as sectoral concentration, the market shares of individual firms within the sector, and the degree of entrepreneurial dynamism.** Although structural analysis alone does not provide a complete picture of the market power held by individual firms, it is an essential tool for identifying structural imbalances and potential competition-related issues.

Within the context of structural imbalances, **one frequently discussed issue in the food value chain is the relatively weak position of farmers compared to processing companies and large retail chains. Farmers often lack sufficient bargaining power to secure fair prices for their products due to imbalances in purchasing power along the chain.** Stronger players, such as major processing firms or retail chains, can leverage their position within the food value chain to negotiate more favourable terms, potentially resulting in lower prices for farmers than would be observed in more competitive industries⁵⁹.

As previously noted, competition conditions are assessed using concentration indicators, which reflect the distribution of market power among firms. Direct measurement of competition is not feasible; therefore, it is evaluated through indicators grouped into three main categories⁶⁰:

- **Structural indicators** analyse the sector or industry structure, for example, through firm concentration. High concentration may limit competition, reduce consumer choice, and increase prices. However, it does not necessarily indicate weak competition, as it may result from intense competition among large firms achieving higher efficiency,

⁵⁹ Agricultural Markets Task Force (2016). „Improving market outcomes: Enhancing the position of farmers in the supply chain“.

⁶⁰ European Commission (2024). „Protecting competition in a changing world - Evidence on the evolution of competition in the EU during the past 25 years“.

-
- **Performance indicators** assess outcomes such as margins (i.e. price-to-marginal costs ratio). High margins signal market power, allowing firms to achieve supra-normal profits. Persistently high margins may indicate weakened competition and the dominance of large players,
 - **Dynamic indicators** track factors such as firm entry and exit, innovation, and changes in market share. Stable dynamics are essential to maintain competitive pressure, foster innovation, and support long-term growth. Declining dynamism reduces sectoral flexibility, leading to stagnation and a decrease in competition.

Recent economic research highlights significant changes in competition over the past decades, including increasing industry concentration, higher margins and profits, widening gaps between leading and other firms, and declining entrepreneurial dynamism⁶¹. These trends may contribute to issues such as stagnating productivity, rising wage disparities at both sector and firm levels, and reduced investment, reflected in declining capital intensity in production.

By evaluating these indicators, the subsequent sections of this analysis provide an overview of the state and development of the food value chain in Slovakia. The situation is assessed through an analysis of revenues and profits at both sector and firm levels, with particular attention to sectoral concentration trends and the identification of potential competition constraints in the context of rising food prices and changing product margins.

⁶¹ European Commission (2024). „Protecting competition in a changing world - Evidence on the evolution of competition in the EU during the past 25 years“.

3.1 Market concentration

The food value chain is characterised by significant imbalances in the number of actors across its different stages. On one hand, there are thousands of suppliers, primarily farmers, who enter the chain as primary producers. On the other hand, there is a much smaller number of processors, wholesalers, and retailers, who subsequently distribute products to a wide consumer base. **This imbalance creates specific dynamics that significantly influence competitive conditions throughout the chain⁶².**

Competition between firms is a process in which companies seek to attract customers with more attractive offerings than their rivals. **Effective economic competition incentivises firms to lower prices, improve product quality, increase productivity, and innovate. Such a process rewards efficient firms with greater market share and displaces less efficient firms,** thereby fostering investment, innovation, productivity, and employment growth. However, research indicates that in EU economies, industrial concentration, margins, and profits have been rising, while entrepreneurial dynamism has been declining⁶³.

Although sectors within the food value chain may appear to be lightly concentrated in many countries, detailed analysis highlights the risk of low levels of effective competition in specific industries. There is a strong positive correlation between sectoral and sub-sectoral concentration, suggesting that analyses of sectoral concentration trends can help better understand concentration developments within more narrowly defined economic segments⁶⁴.

Measuring concentration at the industry level presents significant methodological challenges arising from the broad definition of sectors. Such classifications may not accurately reflect the actual competitive environment within specific segments where firms actively compete. Furthermore, analyses of concentration often overlook important factors such as imports, exports, or inter-firm ownership linkages, potentially leading to misestimated market shares and a distorted overall picture of competition. **It is therefore critical to distinguish between concentration at the sector level and concentration within more narrowly defined segments.** Many sectors may appear lowly concentrated at first glance, yet this may not hold for individual industries. This discrepancy arises from broader industrial classifications, which aggregate data and combine high market shares achieved by firms in narrowly defined industries. **Consequently, sector-level concentration is often lower than industry-level concentration, potentially underestimating competition constraints in specific segments⁶⁵.**

Analysis of accounting data allows for the quantification of industry-level concentration using indices, particularly the Herfindahl-Hirschman Index (HHI). Concentration calculations were performed at the national level, with individual

⁶² OECD (2024). „Competition in the Food Supply Chain“.

⁶³ European Commission (2024). „Protecting competition in a changing world - Evidence on the evolution of competition in the EU during the past 25 years“.

⁶⁴ Deconinck, K. (2021). „Concentration and market power in the food chain“.

⁶⁵ Bajgar, M. et al. (2023). „Industry Industry concentration in Europe and North America“.

industries classified according to four-digit NACE codes. These values were subsequently aggregated to the industry level, taking into account the relative size of each sector.

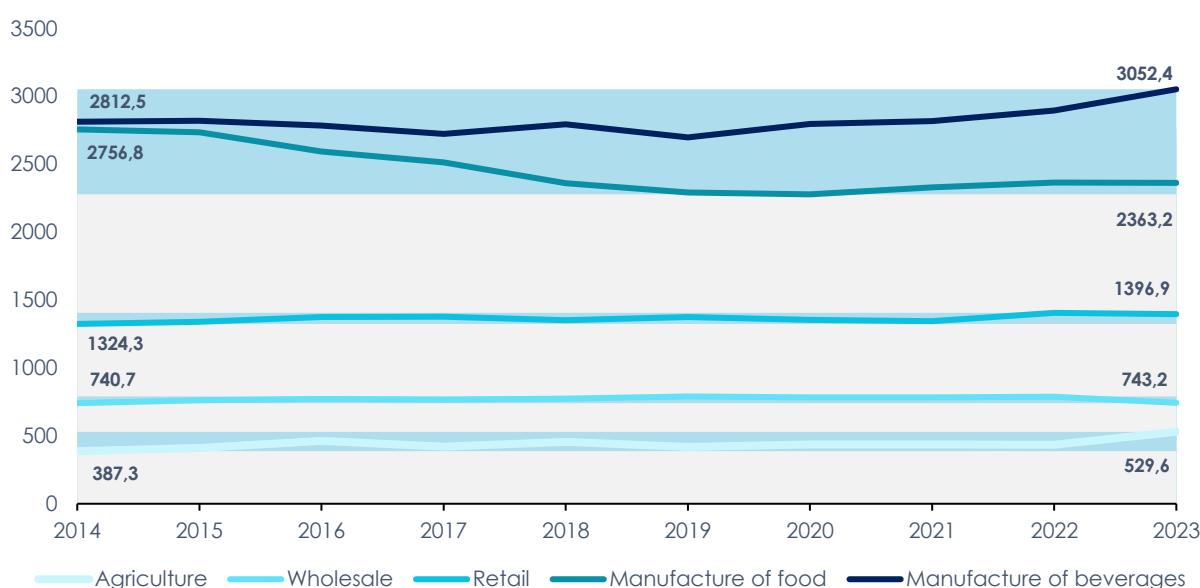
Over the past decade, concentration has exhibited a slightly increasing trend across the entire food value chain (see Figure 33). Although the HHI demonstrates limited volatility, its values tend to rise over the long term. An exception is the beverage manufacturing sector, where the index declined between 2014 and 2020. Since 2020, however, this trend has reversed, with the HHI in this sector increasing modestly from 2278 to 2363 points. **Since the onset of the COVID-19 pandemic, increasing concentration has been observed across all sectors of the food value chain. This phenomenon likely reflects market “cleansing” resulting from lockdowns, which led to the exit of multiple economic entities.**

The distribution of the HHI in 2023 indicates that agriculture, as the lower end of the food value chain, remains the least concentrated sector. An HHI value of 530 points signals a highly competitive environment with a dispersed industry structure and a large number of active actors. **The upper end of the value chain, represented by wholesale and retail, similarly does not exhibit significant signs of high concentration.** In 2023, the HHI for wholesale was 743 points, corresponding to a low level of concentration, while the retail sector recorded a slightly higher value of 1379 points, still within a range that does not indicate competition concerns.

However, **for agriculture, it is important to consider that applying a national market definition may not accurately capture the true competitive dynamics.** Primary producers often operate in local markets, where levels of concentration may differ significantly from national-level data. Therefore, the HHI calculated at the national level may not provide a sufficiently precise measure of the structural organisation of firms in the agricultural sector. For a more accurate understanding of competitive relationships in this industry, **it is advisable to define local markets, taking into account regional distribution of producers, logistical factors, and product-specific demand variations** (see Boxes 5 and 7).

Increased attention is particularly warranted for the mid-section of the food value chain, namely the processing industry. The beverage manufacturing sector recorded an HHI of 3052 points in 2023, placing it in the highly concentrated category and indicating potential risks to maintaining a competitive environment. **Moreover, a continuous rise in concentration has been observed in this sector since 2019, raising concerns regarding the long-term preservation of competitive conditions.** Slightly lower values are observed in the food manufacturing sector, where, following a previous decline, the HHI has increased moderately to just below 2500 points. Concentration trends in these sectors highlight the need for enhanced monitoring to identify potential risks associated with rising concentration and to ensure the maintenance of a competitive environment.

Figure 33 - Market concentration is rising slightly, with challenges in manufacturing



Note: Concentration value is expressed by the HHI index based on the 4-digit NACE code

Source: Author's own calculations based on data from the Register of Financial Statements

A detailed overview of market concentration trends is provided in Table 1, which presents the final values of the Herfindahl-Hirschman Index (HHI) for those industries whose share in total sectoral revenues has consistently exceeded three per cent. Smaller industries were excluded from the analysis, as their inclusion could distort the overall assessment of concentration. The reason lies in the fact that industries with a low turnover naturally exhibit higher levels of concentration due to the limited number of active firms and the lower incentives for market entry. In some cases, these activities do not represent a primary business line and are therefore not fully reported under the relevant NACE code. Typical examples include Growing of spices (NACE 01280) or Manufacture of ice cream (NACE 10520), where the number of economically active firms has remained in single digits over the long term. These industries account for only a negligible share of total sectoral output, while their HHI values are highly volatile, as even small changes in revenues or the number of firms can lead to significant fluctuations in concentration levels.

Over the past decade, HHI values have increased across most parts of the food value chain. **This trend, however, has not been uniform across industries, as the range of changes in concentration levels varies considerably by sector.** Rising concentration is particularly evident in the mid-segments of the value chain, namely food processing and beverage production, where competitive conditions appear more prone to constraints. The processing sector is characterised by a high degree of diversity in the number and type of economic activities. This heterogeneity requires more granular analysis to identify the specific subsectors that contribute most to increases in HHI values. **Identifying these industries is essential for accurately assessing risks linked to reduced competition.**

Although concentration growth has been relatively modest overall, **a more detailed analysis reveals that the increase is largely driven by developments in a limited number of specific industries.** In most industries, competitive intensity remains sufficiently robust. **In 2023, out of a total of 35 industries analysed, 16 were classified as unconcentrated,** with HHI values below 1500 points. **Nine industries displayed moderate concentration,** with HHI values between 1500 and 2500 points, **while ten industries reached the highly concentrated category,** with HHI values exceeding 2500 points. Highly concentrated industries, together with most moderately concentrated ones, are clustered primarily within the processing sector. Conversely, industries with low levels of concentration are found in agriculture and wholesale.

The distribution of industries across concentration categories has shifted slightly since 2014. **At the beginning of the observation period, there were more unconcentrated industries** (21 in total), **but also a higher number of highly concentrated industries** (11 in total). Most of these changes reflected movements across categories by a single level, with industries often situated close to the thresholds defining category boundaries. As a result, relatively small changes in the market shares of active firms led to reclassification between categories. More important than the change in the number of industries per category is the trend in concentration levels over time. **Out of the 35 industries analysed, 23 recorded an increase in HHI values, while 12 experienced a decline. Both increases and decreases occurred across all sectors of the food value chain, although more pronounced changes were concentrated in the processing industry.** This outcome is unsurprising, as HHI values are naturally higher in this sector, increasing sensitivity to shifts in market shares. The most significant increase was recorded in the sub-sector Manufacture of starches and starch products (NACE 10620), where the index rose by 1701 points. A substantial increase was also observed in the sub-sector Distilling, rectifying and blending of spirits (NACE 11010), where the index grew by 1499 points. By contrast, the largest decreases were noted in Manufacture of other food products (NACE 10890), where the HHI fell by 2045 points, and in the Manufacture of malt (NACE 11060), where it declined by 1038 points.

For other parts of the chain, however, concentration dynamics do not suggest significant competition concerns. The evidence points to the fact that increasing concentration is not a universal phenomenon across the entire economic environment, but rather occurs in specific industries, with these upward shifts contributing to the modest overall increase in HHI values during the reference period.

By contrast, only marginal changes were recorded in the retail sector. Retail chains operating in Slovakia, represented by the sub-sector Retail sale in non-specialised stores (NACE 47110), experienced a minor increase of 57 points in their HHI over the past decade. **Although public debate often emphasises the strong market power of retail chains, the current concentration level (1 326 points) suggests that the sector remains sufficiently competitive.** This value is positioned just below the threshold separating unconcentrated industries from moderately concentrated ones, which may be interpreted as a positive signal of the continued presence of effective competition in the retail sector.

Table 1 - Overview and development of the Concentration Index (HHI) in slovak food sectors

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Agriculture	387,3	411,0	462,4	419,5	455,6	416,9	437,6	436,1	433,4	529,6
01110 Growing of cereals	39,3	39,2	40,3	43,7	38,1	44,5	41,4	41,6	44,2	41,8
01130 Growing of vegetables	1041,7	1133,6	867,3	1337,2	1658,6	1714,4	1827,4	1893,4	2005,2	1220,9
01410 Raising of dairycattle	272,1	221,1	251,1	263,5	262,8	268,0	289,0	290,0	290,2	186,0
01460 Raising of pigs	1350,0	1393,0	1416,1	1383,1	1386,3	1399,2	1381,6	1574,8	1607,7	1650,9
01470 Raising of poultry	677,0	633,5	712,9	746,5	662,3	554,7	593,5	585,3	572,8	604,8
01500 Mixed farming	79,3	66,9	63,5	63,6	61,3	62,2	62,1	61,4	68,8	76,9
01610 Support activities for crop production	292,6	348,5	290,5	349,7	295,6	292,3	297,3	265,2	294,1	438,8
Manufacture of food	2756,8	2735,2	2594,9	2513,2	2359,5	2293,0	2278,4	2329,8	2364,6	2363,2
10110 Processing and preserving of meat	1250,4	1271,6	1308,0	1232,7	1286,7	1437,9	1474,3	923,4	1111,4	1620,3
10120 Processing and preserving of poultry meat	2903,8	2673,9	2648,7	2461,5	2361,2	2306,8	2579,0	3339,1	3152,3	3853,2
10130 Production of meat products	1815,7	2212,4	2403,2	2315,2	1857,8	1802,4	2036,8	1621,8	1602,3	1511,3
10390 Processing and preserving of fruit and vegetables	2138,0	2367,6	2315,5	2397,4	2437,3	2245,3	1827,9	1892,9	1830,4	2171,0
10410 Manufacture of oils and fats	2853,8	2366,5	2055,5	2381,4	3299,3	2646,5	3147,8	3897,3	3522,4	3563,0
10510 Manufacture of dairy products	1237,1	1266,6	1236,6	1254,9	1253,6	1212,2	1208,3	1225,7	1270,3	1278,6
10610 Manufacture of grain mill products	1126,7	1125,0	1293,1	1327,5	1315,8	1456,9	1539,6	1594,6	1628,5	2065,1
10620 Manufacture of starches and starch products	8131,9	8015,9	7464,2	7189,9	7035,5	6720,6	6585,7	7026,9	7420,5	9832,9
10710 Manufacture of bread, fresh pastrygoods and cakes	477,6	436,2	412,9	410,5	434,7	387,9	366,1	368,3	443,8	362,6
10720 Manufacture of rusks and biscuits	4617,9	4562,5	4747,9	4496,6	4358,9	4436,8	4311,2	4068,1	3814,3	3628,2
10810 Manufacture of sugar	5041,9	5519,9	5301,7	5367,6	5083,3	5317,3	5228,9	5485,4	5389,3	5587,4
10820 Manufacture of cocoa, chocolate and confectionery	3695,8	3926,6	4527,9	4432,9	4465,9	4369,7	4319,7	4247,4	6435,8	4052,9
10890 Manufacture of other food products	3610,2	3571,9	2812,6	2815,9	2667,2	2635,2	2290,5	2264,4	2214,2	1565,1

Manufacture of beverages	2812,5	2819,3	2785,0	2724,0	2793,4	2697,8	2796,0	2817,9	2895,4	3052,4
11010 Distilling, rectifying and blending of spirits	1977,0	2069,2	2110,7	1868,6	2014,9	1999,5	2029,4	2125,9	2730,3	3476,0
11020 Manufacture of wine from grape	1037,1	974,2	954,7	861,2	897,0	900,2	886,8	865,6	800,5	860,4
11050 Manufacture of beer	3824,4	3776,7	3788,1	3667,3	3790,0	3791,8	3955,9	4055,7	4099,6	4185,5
11060 Manufacture of malt	3438,5	3023,9	3151,7	3076,9	2502,4	2473,1	2472,4	2418,6	2309,4	2400,1
11070 Manufacture of soft drinks	2686,2	2836,1	2603,5	2883,7	3076,7	2617,5	2911,5	2989,2	3073,5	3124,8
Wholesale	740,7	761,8	770,5	766,6	775,1	790,1	783,5	782,6	787,1	743,2
46210 Wholesale of grain, seeds and animal feeds	616,1	604,9	599,8	581,7	582,6	600,0	575,8	656,4	763,1	705,9
46310 Wholesale of fruit and vegetables	683,0	630,1	605,5	651,7	614,4	664,8	723,7	723,4	792,1	741,1
46330 Wholesale of dairyproducts, eggs, oils and fats	734,9	714,8	714,6	785,4	868,4	851,8	893,1	586,8	756,1	960,9
46340 Wholesale of beverages	1064,3	1082,1	1051,0	1019,7	985,0	1023,6	883,3	669,7	653,0	574,5
46360 Wholesale of sugar, chocolate and confectionery	822,4	1220,7	1181,5	1184,9	1216,1	1229,3	1339,0	1228,4	1852,4	1605,5
46380 Wholesale of other food	992,4	1123,5	1255,8	1353,0	1534,4	1504,1	1448,0	1617,5	1094,6	1085,7
46390 Non-specialised wholesale of food	717,5	719,9	730,9	704,2	698,8	701,2	712,3	728,3	744,6	671,6
Retail	1324,3	1340,5	1374,9	1376,8	1351,7	1375,8	1353,9	1344,9	1405,8	1396,9
47110 Retail sale in non-specialised stores with food	1269,5	1293,2	1330,7	1318,8	1285,9	1303,4	1292,6	1293,5	1328,2	1326,2
47220 Retail sale of meat and meat products	548,5	741,2	1179,2	1500,3	1768,0	2063,0	1679,4	1575,2	2677,9	2684,9
47290 Other retail sale of food	3025,9	2689,9	2424,2	2542,5	2443,2	2327,8	2328,3	2208,8	2048,6	1836,6

Note: The sectoral aggregation of the HHI is based on a weighted average of the concentration index in a given sector. The weights are calculated as the relative size of the market (4-digit NACE category), or as the share of market sales in total sector sales

Source: Author's own calculations based on data from the Register of Financial Statements

The distribution of market shares among the largest firms and its evolution over time largely correspond to the values of the Herfindahl-Hirschman Index (HHI). The results of concentration analysis, measured through the Concentration Ratio (CR), thus corroborate the findings on market share distribution (see Figure 34). A detailed comparison of the trends in the HHI and CR10 indicators is provided in Annex 9, which offers deeper insights into the dynamics of market shares and identifies industries where concentration tendencies are either intensifying or weakening.

Within the food value chain, the retail segment is most frequently discussed in the context of potential competition concerns. **Despite the criticism often directed at retail chains both in Slovakia and abroad, the available data indicate that concentration levels in slovak food retail are relatively moderate in an international perspective.** Competition authorities across the European Union regularly highlight high concentration levels in food retail, with some countries recording exceptionally high figures. In comparison, **slovak retail exhibits lower levels of industry concentration, suggesting a more diversified competitive environment.** In 2023, the four largest firms (CR4) accounted for 69,3% of total retail turnover, while the ten largest firms (CR10) controlled 79,5% of the market. This outcome remains comparatively favourable in international terms, particularly when contrasted with countries where retail concentration is significantly higher. For instance, in Latvia, the three largest firms captured 68% of the market in 2023, while in Finland the figure was 82%. Even higher concentration was observed in Austria, where four firms controlled 91% of the retail market. Similarly, in Croatia, the ten largest chains accounted for 86,7% of total retail sales⁶⁶.

Some indication of market power can be inferred from the leading position of the largest firm in slovak food retail. In 2023, Lidl recorded a market share of 22,6%, maintaining the leading position over the previous five years. **While stable and long-term market leadership can, according to competition economics, suggest a less competitive market environment, such an interpretation appears unlikely in the slovak context.** Although Lidl's share remains the largest, it is not at a level that would enable the exercise of significant market power, such as price setting, controlling entry conditions, or restricting competitors. Moreover, there is no evidence of a widening gap between the market leader and its closest competitors. On the contrary, **competition among retail chains in Slovakia appears to be intense, as indicated by relatively narrow differences in market shares.** Market equilibrium is further supported by low entry barriers in the retail sector, which enable new players to enter the market. **In this regard, the entry of the major Polish retailer Biedronka in March 2025 is expected to gradually reduce concentration levels in slovak food retail, assuming that no existing player exits the market.** Already at present, concentration indicators point to an environment of strong competition, the share of revenues captured by the ten

⁶⁶ OECD Global Forum on Competition (2024). „Competition in the Food Supply Chain - Contributions from Austria, Croatia, European Union, Finland and Latvia“.

largest retailers has remained broadly stable, between 77,8% and 79,5%, over the period between years 2014 and 2023 (see Annex 9).

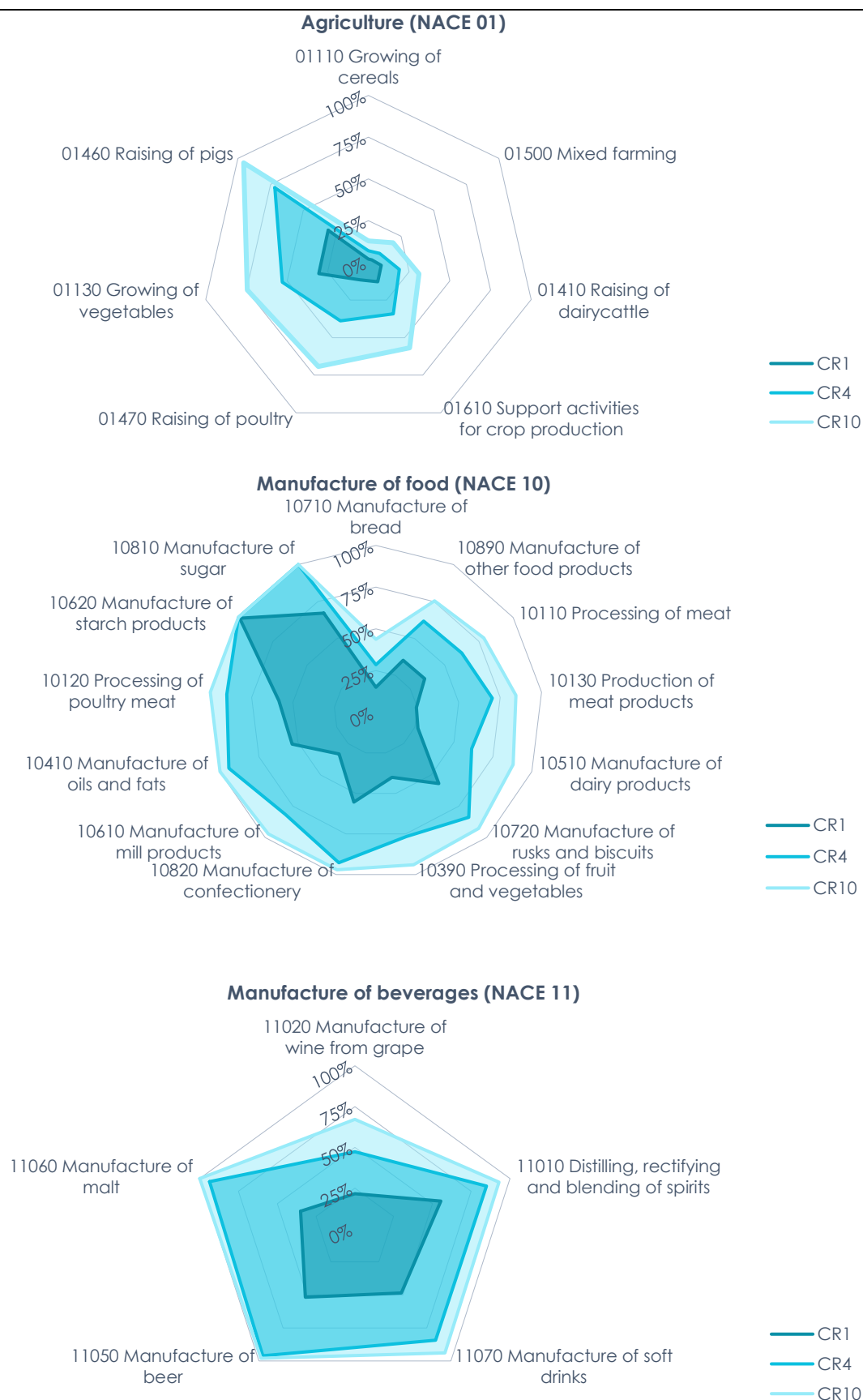
In agriculture, the distribution of market shares is considerably more even. With the exception of sub-sector Raising of pigs (NACE 01460), the four largest firms in the observed agricultural industries do not exceed a combined market share of 50%. The most competitive industry within the slovak food value chain is Mixed farming (NACE 01500), where the CR4 has consistently remained below 10%, indicating a very high degree of competition.

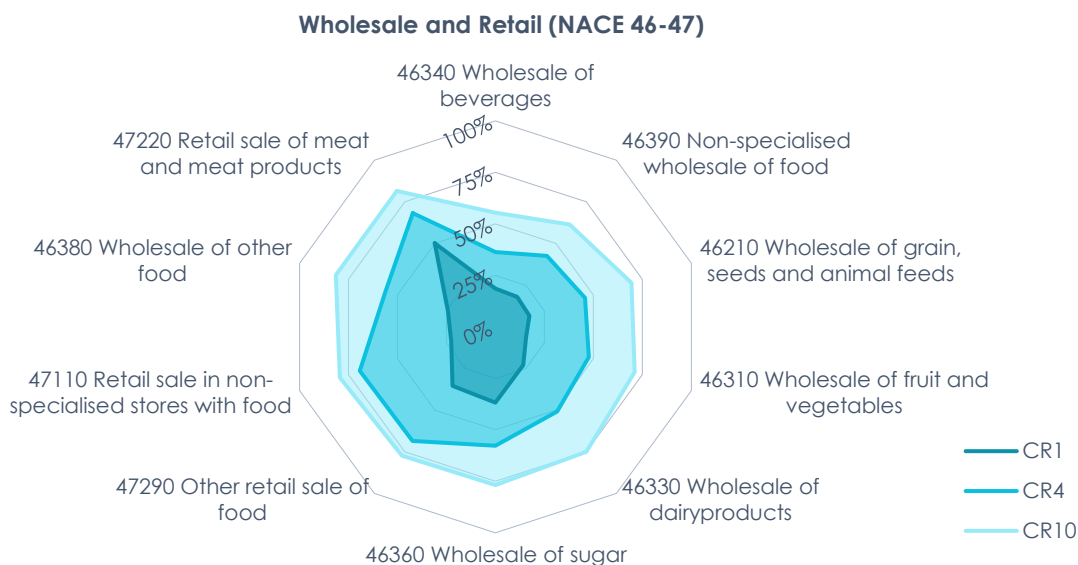
By contrast, food processing industries show much higher levels of concentration among leading firms. In many subsectors, the ten largest firms effectively control the entire market. Notably, the difference between the CR4 and CR10 values is often marginal, indicating that actual market power is concentrated among an even smaller number of firms. The remaining firms within CR10 contribute only insignificantly to total turnover. In industries such as Manufacture of sugar (NACE 10810), Manufacture of oils and fats (NACE 10410), Manufacture of confectionery (NACE 10820), Manufacture of beer (NACE 11050), and Manufacture of malt (NACE 11060), almost the entire output is concentrated within the four largest firms, suggesting a highly limited scope of competition. **It should be noted, however, that the apparent significance of firm concentration may be overstated due to methodological constraints affecting the HHI values** (see Boxes 5 and 6).

An extreme example of high concentration is the Manufacture of starch products (NACE 10620), where the entire industry depends on a single operator, Tate & Lyle Boleráz. This situation is reflected in an HHI value of 9833 points, which, in theoretical terms, corresponds to a monopoly structure and the absence of meaningful competition. **One possible explanation for such high concentration in food processing industries is the limited presence of domestic production in consumer markets.** All the aforementioned highly concentrated industries also record a significant share of imports in the total volume of goods available domestically. **While the data highlight extreme concentration, they should be interpreted with caution.** Given that a substantial share of consumption in these product categories originates from imports, this factor must be taken into account when assessing the effective level of competition (see Box 6).

Conversely, a lower degree of concentration may be observed in Manufacture of bread and pastrygoods (NACE 10710), which in 2023 was the only processing industry where the CR10 value remained below 50% at the national level. **This may indicate a more fragmented industry structure compared to other processing subsectors. Nevertheless, when interpreting concentration levels in this industry, methodological challenges must again be carefully considered** (see Box 5). Furthermore, given certain specificities and trends in bread and bakery production, including varying product characteristics (e.g. shelf life), **it may in some cases be more appropriate to assess concentration at a more disaggregated level than the national one** (see Box 7).

Figure 34 - Agriculture and trade remain competitive, but manufacturing is dominated by large firms





Note: Concentration value is expressed by the CR based on the 4-digit NACE code

Source: Author's own calculations based on data from the Register of Financial Statements

Certain sectors with relatively high concentration indicators do not necessarily signal distortions of competition. As a small economy, Slovakia is characterised by a relatively limited domestic market. **Smaller markets tend to display higher concentration due to the lower number of competitors and substitutes**, with an inverse relationship generally observed between concentration levels and the size of the economy⁶⁷. In this context, **Slovakia's integration into the EU has had a decisive impact on shaping its domestic market.** On the one hand, the Single European Market has opened new opportunities for slovak firms by expanding market access and offering consumers greater product variety. On the other hand, it has also triggered structural changes that strengthen the bargaining power of dominant players at different stages of the supply chain, thereby exacerbating asymmetries between participants⁶⁸. Consequently, **the number of actors at each stage of the value chain represents another factor with direct implications for consumer prices.**

The decline in business dynamism constitutes a serious challenge to competitiveness, as market entry of new firms and exit of non-viable ones are key drivers of innovation and growth. The process of so-called "creative destruction," through which outdated technologies, business models and practices are replaced by new ones, contributes to economic growth and productivity gains. However, empirical evidence suggests that **rising sectoral concentration may dampen entrepreneurial dynamism by strengthening the position of large incumbents at the expense of smaller players**⁶⁹. The dynamics of market structure further illustrate that investment in intangible assets, such as technology, goodwill or know-how, can reduce firms' variable costs but simultaneously increase fixed costs and erect entry barriers. These mechanisms

⁶⁷ European Commission (2024). „Protecting competition in a changing world - Evidence on the evolution of competition in the EU during the past 25 years“.

⁶⁸ European Commission (2024). „Transition Pathway for the agri-food industrial ecosystem“.

⁶⁹ European Commission (2024). „Protecting competition in a changing world - Evidence on the evolution of competition in the EU during the past 25 years“.

reinforce the dominance of established firms, which can preserve their market leadership, while raising the hurdles faced by new entrants⁷⁰.

Between 2015 and 2023, the number of active firms in Slovakia increased across all parts of the agri-food value chain, with the exception of wholesale, where firm numbers declined by nearly 10% (see Figure 35). The most significant relative increase occurred in the food manufacturing sector, where the number of enterprises expanded by almost 75%, potentially signalling stronger competitive dynamics.

Although overall firm numbers influence sectoral concentration indicators. **Increase in the number of firms does not automatically translate into lower concentration levels as measured by HHI or CR indices. This is because the slovak agri-food sector is currently dominated by a large number of small and medium-sized enterprises (SMEs) with marginal market shares, which are not able to exert meaningful competitive pressure on major players.** The processing industries, in particular, are shaped by a limited number of large firms. While a **high number of smaller firms may be seen as positive for the competitive environment, the gap between market leaders and the rest of the firms remains excessively wide.**

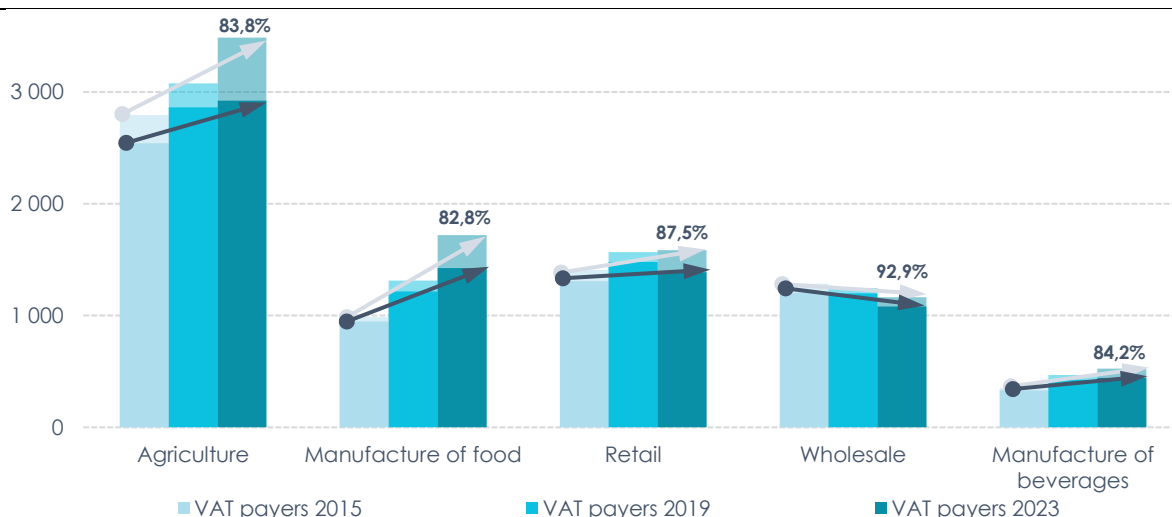
Given that the highest HHI values are found in food processing, current trends indicate that the sharp increase in the number of small firms is not sufficient to bring concentration down to an acceptable level (HHI below 1500 points). Although the expansion in food manufacturing has contributed to a decline in concentration, values remain in the highly concentrated range. The average HHI score for food manufacturing decreased from 2735 in 2015 to 2363 in 2023. **Nonetheless, the significant increase in the number of enterprises can be regarded as a positive signal of renewed market dynamism.** Conversely, in agriculture, beverage production and retail, HHI values did not decline despite rising numbers of firms. On the contrary, they increased over the 2015-2023 period. **Strengthening competitiveness therefore requires that new entrants not only emerge but also expand and consolidate their market positions to constitute genuine competitors to leading firms and thereby weaken their market power.**

The share of incumbent firms declined across all agri-food sectors between 2015 and 2023, with the most pronounced decrease occurring in food manufacturing. The number of incumbents (measured as VAT payers) fell by more than 13 percentage points, indicating the entry of new firms and a revitalisation of the market. **While this indicator grew during 2015–2019, it subsequently declined, most likely due to the pandemic, which eliminated vulnerable firms while simultaneously encouraging the creation of new entrepreneurial entities.** This trend is further corroborated by data on the relative increase in the number of new firms, which outpaced the overall growth of business entities across all sectors. In wholesale, the decrease was more moderate (-9,4%) compared to the overall decline in business entities (-10,2%).

⁷⁰ De Ridder, M. (2024). „Market power and innovation in the intangible economy“.

Although the pandemic likely facilitated the emergence of small producers and contributed to greater market diversification, most of these firms currently lack the resources and capacity to compete with established large companies. **Their presence therefore reflects more a short-term adjustment to crisis-related factors than a structural transformation of the market.** A key determinant going forward will be the provision of a supportive business environment that enables the development of sustainable competition and strengthens market dynamism.

Figure 35 - New firms mostly entered in manufacturing, while wholesale market has consolidated



Note: The total number of firms represents firms with positive non-zero sales. The remaining records have been removed from observation for this purpose, to eliminate bias in the resulting values. The number of VAT payers is based on the number of firms with sales above the statutory VAT registration threshold of 49 790 euros

Source: Author's own calculations based on data from the Register of Financial Statements

The agri-food supply chain is characterised by pronounced heterogeneity across its constituent sectors, reflected in different levels of horizontal concentration. This diversity is mirrored in the spectrum of market participants, ranging from SMEs to large multinational corporations. **Differences in the structural composition of the various stages of the food value chain may represent one of the key factors explaining divergences in profit margins across sectors, which in turn determine the degree of price transmission along the chain.**

Empirical evidence suggests that the presence of non-competitive market structures and the exercise of market power are frequently considered among the main factors behind imperfect price transmission⁷¹. **However, data analysis indicates that the recent surge in food inflation in Slovakia was primarily driven by non-competition-related factors.** Lower levels of competition in certain sectors may have contributed only to a limited extent to recent price shocks, as there is little evidence of widespread competition problems in the slovak agri-food sector.

⁷¹ European Commission (2009). „Analysis of price transmission along the food supply chain in the EU“.

Box 5 – Methodological challenges in measuring market concentration

When assessing sectoral concentration through indicators such as the Herfindahl–Hirschman Index (HHI) and the Concentration Ratio (CR), **it is essential to highlight several methodological challenges that may affect the accuracy and reliability of the conclusions.** These indicators rely exclusively on two core variables: the total value of production, measured by firms' turnover, and the number of enterprises operating in a given sector. However, such an approach overlooks several important aspects that are critical for a comprehensive assessment of competitiveness.

First, **turnover figures primarily reflect the value of domestic production, which does not provide an accurate picture of the origin of goods and services that effectively compete in the domestic market.** This issue is particularly relevant in the agri-food sector, where a substantial share of products competing with domestic production originates abroad. At the same time, a portion of the output of Slovak firms is exported to foreign markets. Turnover data therefore includes exports that are not present on the domestic market while failing to capture imports that directly compete with domestic products. This methodological shortcoming may explain the apparent monopoly of the company Tate & Lyle Boleráz in the sector "Manufacture of starches and starch products" (NACE 10620), as the company is strongly export-oriented, whereas a significant share of competing products available domestically is imported.

Further methodological limitation arises from the statistical classification of economic activities (NACE), which assigns enterprises to sectors based on their primary activity. This approach may lead to distortions. If a company produces several types of goods, its entire output is reported under the sector corresponding to its main activity. For example, a company primarily engaged in the processing of fresh meat, but also producing meat products, is classified exclusively under Processing and preserving of meat (NACE 10110). In such cases, the production of meat products is not recorded under Processing and preserving of poultry meat products (NACE 10130), potentially leading to an underestimation of competition in one sector and an overestimation in another. A similar situation applies to Tate & Lyle Boleráz, whose portfolio of activities extends beyond starch production. Numerous such cases exist, highlighting that the lack of detailed turnover breakdowns represents a significant limiting factor that may distort concentration indicators. **In practice, companies classified under one sector may, in reality, compete across several segments, which these indicators fail to capture.**

Another significant challenge concerns the definition of the relevant market from a geographical perspective. Concentration indicators generally assume that the market corresponds to the entire domestic economy. However, **this assumption is not appropriate for all goods and services. In the case of food products, freshness and shelf life play a decisive role, naturally limiting the geographical reach of markets.** In addition, logistical constraints, purchasing power, and consumer preferences, which vary across regions, are also key factors. For example, in the Manufacture of bread

and bakery products sub-sector (NACE 10710), firms may compete locally within certain sub-segments (e.g. unpackaged or partially baked fresh bread). In such cases, **it is more appropriate to define local rather than national markets, while accounting for regional differences in consumer purchasing power and preferences.** Similarly, given the strong penetration of foreign producers and the availability of their products on domestic markets, the definition of cross-border or supra-national markets also requires careful consideration.

Finally, **the absence of information on ownership linkages between enterprises may also distort concentration measures.** Firms belonging to the same corporate group effectively do not compete with one another, and should therefore be considered as a single entity. In agriculture, for instance, the large number of farms with relatively small market shares results in low HHI values. Yet analysis by the Ministry of Agriculture and Rural Development (MPRV SR) shows that linked farms, which are 8,5 times fewer in number than unlinked ones, control one-third of agricultural land in Slovakia. Furthermore, the average direct payment per final beneficiary is 5,85 times higher in linked farms compared to unlinked farms.⁷² **These findings suggest that economic activity is more concentrated within linked farms than standard indicators imply, likely leading to higher effective concentration levels.** In the retail sector, the case of Kaufland and Lidl illustrates the same issue: although they compete in the grocery market, both belong to the Schwarz Gruppe.

For these reasons, conclusions on sectoral concentration must be formulated with caution, taking into account the methodological limitations outlined above. **HHI and CR should primarily be regarded as indicative signals that may point to the need for more detailed sectoral analysis and closer examination of market structures.** Complementary information, such as firm-level profitability, can provide valuable insights to support a more accurate interpretation of results and the formulation of sounder policy conclusions⁷³. In addition, **sector inquiries conducted by competition authorities may serve as a more relevant source of evidence, as standardised indicators often fail to adequately capture the actual functioning of markets for goods and services**⁷⁴.

⁷² Ministry of Agriculture and Rural Development of the Slovak republic (2023). „Analýza vplyvov stropovania priamych platieb Spoločnej poľnohospodárskej politiky a inštitucionálnej pripravenosti stropovania na konečného užívateľa výhod“.

⁷³ Deconinck, K. (2021). „Concentration and market power in the food chain“.

⁷⁴ European Commission (2024). „Transition Pathway for the agri-food industrial ecosystem“.

Box 6 – Foreign competition as a driver of concentration changes

In conventional economic analysis, market concentration is typically assessed using indicators such as the Herfindahl–Hirschman Index (HHI) or Concentration Ratios (CR), which measure the market shares of the largest firms. **These indicators are generally based on the turnover of domestic producers, thereby creating a potentially distorted picture of actual competition in the market.** Turnover predominantly reflects domestic production, without accounting for the origin of all products that effectively compete in the domestic market. **This limitation is particularly pronounced in the agri-food sector, where a substantial share of supply consists of imported goods directly competing with domestic production.** At the same time, part of the output of slovak firms is exported and therefore not consumed domestically. As a result, turnover data includes exports, which have no bearing on domestic competition, while failing to account for imports, which exert a decisive influence on competitive dynamics.

Consequently, traditional concentration indicators fail to capture the role of foreign competitors entering the domestic market through imports⁷⁵. **In open economies such as Slovakia, this leads to a systematic overestimation of concentration levels and an underestimation of actual competition.** To address this bias, the so-called Import-Adjusted Herfindahl–Hirschman Index (HHI-IA) has been introduced, which can be defined as follows:

$$HHI - IA = \sum_{i=1}^N MarketShare_i^2 * (1 - MarketPenetration) \quad (7)$$

assuming,

$$MarketPenetration = \frac{ImportedProduction}{(ImportedProduction + DomesticProduction)} \quad (8)$$

where

<i>MarketShare</i>	is denoted to share of a domestic firm within the domestic segment of the economy
<i>MarketPenetration</i>	is denoted to the share of imports in total domestic consumption
<i>ImporedProduction</i>	Is denoted to the value of imported production
<i>DomesticProduction</i>	Is denoted to the value of domestic production sold on the domestic market

⁷⁵ Covarrubias, M. - Gutiérrez, G. - Philippon, T. (2019). „From Good to Bad Concentration? US Industries over the Past 30 Years“.

This formulation can be simplified as follows:

$$HHI - IA = \text{DomesticShare} * HHI \quad (9)$$

assuming,

$$\text{DomesticShare} = \frac{\text{DomesticProduction}}{(\text{ImportedProduction} + \text{DomesticProduction})} \quad (10)$$

where

DomesticShare is denoted to the share of domestic production in total consumption

HHI is denoted the concentration level within segments of the domestic economy, calculated exclusively on the basis of domestic firms' production values

The factor of import penetration recognises that foreign competition effectively “dilutes” the market share of domestic firms, thereby reducing their ability to exercise significant market power⁷⁶. Adjusting the Herfindahl–Hirschman Index (HHI) for imports generates a number of important analytical implications, most frequently highlighted as follows:

- **Reduction in nominal concentration:** the value of the import-adjusted HHI (HHI-IA) is always lower than, or equal to, the standard HHI, which is calculated solely on the basis of domestic production. This implies that actual concentration in markets with high import intensity is lower than suggested by the standard HHI;
- **Improved indication of competitive pressure:** the HHI-IA provides a more accurate reflection of market power as it accounts for substitutable imported products. In sectors with a high share of imports, the HHI-IA may signal that the effective competitive environment is considerably more intense. The adjustment proportionally reduces the market shares of domestic firms, thereby correcting the bias of the standard HHI;
- **Enhanced interpretability for regulatory intervention:** the HHI-IA supports more evidence-based decision-making in areas such as merger control, state aid, or consumer protection. For instance, a high standard HHI does not necessarily imply the need for regulatory intervention if strong competitive pressure from imports ensures sufficient rivalry in the market.

⁷⁶ Gutiérrez, G. – Philippon, T. (2017). „Declining Competition and Investment In The U.S.“.

At the same time, the introduction of import-adjusted concentration measures entails several challenges and methodological limitations, most commonly noted in the literature and practice:

- **Data availability:** robust calculation requires reliable data on the volume and structure of imports, ideally at the firm level. In the absence of such information, adjustments can be made at the sectoral level, provided that trade statistics are made compatible with data on domestic production, which often follow different methodologies;
- **Assumption of equal competitive impact:** adjustment assumes that imported products originate from equally competitive environments as domestic production. This may not hold where foreign suppliers possess different levels of market power, rely on distinct supplier–buyer structures, or where the quality of imported goods differs significantly from domestic products;
- **Exclusion of exports:** since a share of domestic production is exported and therefore does not compete on the domestic market, reliance on turnover data inflates the market shares of domestic firms. This results in an overestimation of concentration and an underestimation of the true intensity of competition in the domestic market;
- **Neglect of import concentration:** if imports stem from markets where a small number of foreign firms command significant market shares and exercise market power, the HHI-IA may underestimate global concentration.

Because the standard HHI is derived from sectoral production data, it was necessary to ensure consistency between import statistics and domestic production values, which are based on different methodologies. For this purpose, concordance tables were used to link the NACE statistical classification system to the United Nations' Combined Nomenclature (CN), the EU's common customs tariff and foreign trade classification system⁷⁷.

The adjustment of market concentration measures for imports was applied to those agri-food sub-sectors that, in 2023, exhibited high levels of concentration, defined as a standard HHI above 2 500 points. Table B6_1 provides an overview of these sectors, comparing the original and adjusted HHI values.

The comparison points to a more competitive environment, as in many highly concentrated subsectors domestic production directly competes with foreign imports. The degree of import penetration into the slovak consumer market leads to a proportional decline in concentration levels. The most notable reductions were observed in Manufacture of confectionery and in Manufacture of soft drinks sub-sectors, where high import penetration reduced the sectoral HHI to below 1 500

⁷⁷ Commission communication (2000/C 150/03): „Code of conduct for the management of the Combined Nomenclature“.

points. As a result, these sectors shifted from the category of high concentration to that of low concentration.

Table B6_1 – Changes in Concentration Index by adjustment for imports

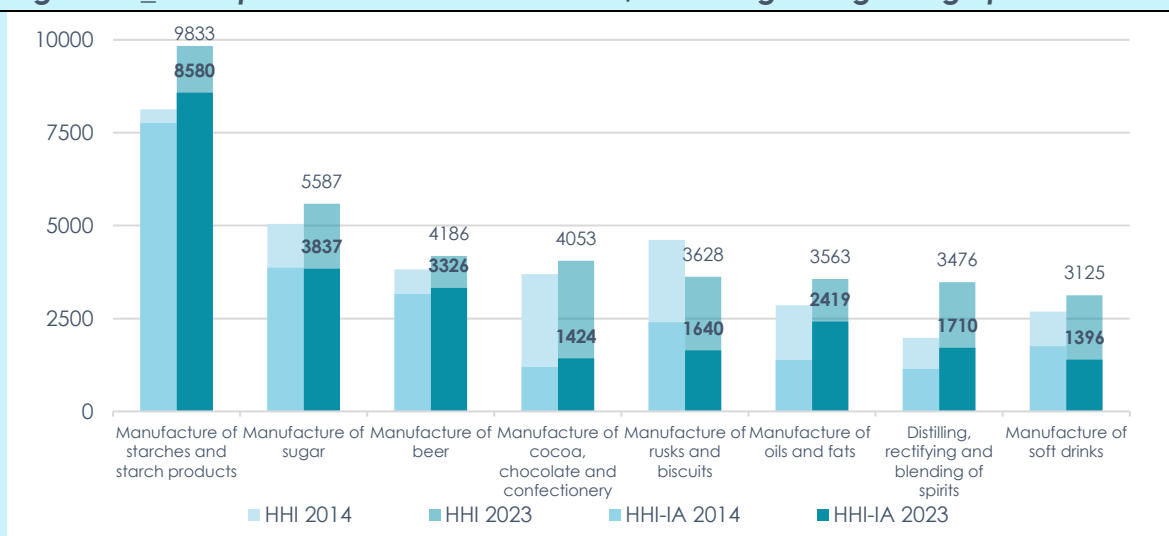
			2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
10410	Manufacture of oils and fats	HHI	2853,8	2366,5	2055,5	2381,4	3299,3	2646,5	3147,8	3897,3	3522,4	3563,0
		HHI-IA	1384,0	1366,2	1255,0	1363,1	1780,9	1460,9	1776,3	1872,1	1643,5	2419,0
10620	Manufacture of starches and starch products	HHI	8131,9	8015,9	7464,2	7189,9	7035,5	6720,6	6585,7	7026,9	7420,5	9832,9
		HHI-IA	7758,8	7673,3	7134,2	6825,0	6665,6	6310,5	6162,9	6595,2	6575,6	8580,1
10720	Manufacture of rusks and biscuits	HHI	4617,9	4562,5	4747,9	4496,6	4358,9	4436,8	4311,2	4068,1	3814,3	3628,2
		HHI-IA	2398,9	2254,6	2385,7	2360,2	2180,5	2172,5	1995,9	1726,3	1653,2	1640,4
10810	Manufacture of sugar	HHI	5041,9	5519,9	5301,7	5367,6	5083,3	5317,3	5228,9	5485,4	5389,3	5587,4
		HHI-IA	3863,6	4531,6	4267,8	4285,1	3685,1	3777,1	3853,4	4120,7	4007,8	3837,2
10820	Manufacture of cocoa, chocolate and confectionery	HHI	3695,8	3926,6	4527,9	4432,9	4465,9	4369,7	4319,7	4247,4	6435,8	4052,9
		HHI-IA	1191,5	1206,4	1173,7	1191,8	1262,9	1274,0	1267,8	1151,5	1183,3	1423,6
11010	Distilling, rectifying and blending of spirits	HHI	1977,0	2069,2	2110,7	1868,6	2014,9	1999,5	2029,4	2125,9	2730,3	3476,0
		HHI-IA	1143,6	1138,6	1033,2	928,5	984,4	996,3	1062,0	1076,0	1245,0	1709,7
11050	Manufacture of beer	HHI	3824,4	3776,7	3788,1	3667,3	3790,0	3791,8	3955,9	4055,7	4099,6	4185,5
		HHI-IA	3159,0	3078,9	3114,1	2966,2	2954,3	3056,3	3113,0	3224,1	3263,0	3325,9
11070	Manufacture of soft drinks	HHI	2686,2	2836,1	2603,5	2883,7	3076,7	2617,5	2911,5	2989,2	3073,5	3124,8
		HHI-IA	1758,3	1826,8	1541,9	1503,4	1522,0	1318,6	1392,5	1463,5	1464,1	1396,3

Source: Author's own calculations based on data from the Register of Financial Statements and Eurostat database (ds-045409, data updated on 16/04/2025)

In general, **the HHI-IA consistently yields lower values than the standard index.** However, in the case of Manufacture of starch products and Manufacture of beer, the adjustment resulted in only marginal changes (see Figure B6_1). **One methodological limitation of the HHI-IA remains the exclusion of exports, which inflates the estimated market shares of domestic firms.** For instance, during the reference period, the domestic share in the beer sector amounted to around 80%, and in the starch sector exceeded 90%. These figures do not reflect the actual market structure, where imported goods hold a more significant role. If exports were also adjusted for, concentration levels would fall further due to a higher import penetration ratio.

Finally, **the import adjustment reduces volatility in recorded concentration levels. When domestic production decreases, higher import levels help stabilise competitive conditions and preserve market balance.** Although fluctuations in HHI-IA values were observed across sectors over the past decade, their magnitude was significantly lower than under the standard HHI. In certain cases, such as Manufacture of soft drinks and Manufacture of sugar, the adjustment even reversed the trend. While the standard HHI suggested increasing concentration, the HHI-IA either stabilised or displayed a declining trajectory.

Figure B6_1 – Imports reduce concentration, reflecting strong foreign penetration



Source: Author's own calculations based on data from the Register of Financial Statements and Eurostat database (ds-045409, data updated on 16/04/2025)

Overall, **the import-adjusted HHI (HHI-IA) provides a more realistic depiction of competitive dynamics across sectors and enables more accurate assessments of market structure, thereby informing the design of regulatory measures and economic policy recommendations.** The adjustment is particularly relevant in sectors where imports account for a substantial share of the market, as is the case in Slovakia's agri-food industry. Despite remaining methodological limitations, the HHI-IA allows for a clearer and more robust interpretation of competitive conditions than the standard concentration index.

Box 7 – Regional concentration in „Manufacture of bread and pastrygoods“ segment

As illustrated by the case of the Manufacture of bread and pastrygoods sub-sector, the diversity of product portfolios across individual bakery companies suggests that it may be appropriate to assess the degree of regional competition, which may differ substantially from competition measured at the national level.

The calculation of concentration ratios incorporating a regional dimension would, however, require highly granular data at the supplier–customer level, as well as detailed information on the scope of product portfolios. Unfortunately, such data were not available at the time of drafting this analysis. For this reason, we resort to an economic approximation of regional production concentration, based on accounting data and analytical employment records from the databases of the Social Insurance Agency. Specifically, we employ information on firms' registered addresses, personnel costs, turnover, and the place of work of individual employees. Since precise geographic information on the distribution of production and deliveries (i.e. firms' operational sites) is not available, the slovak market is provisionally divided into administrative regions. **This does not amount to the delineation of relevant geographic markets in the legal sense⁷⁸, but rather provides an indicative estimate of how the regional industrial structure and production concentration in this sector may appear.**

As shown in Table 1, low national concentration values for bread and bakery production are unlikely to capture the actual degree of competition. In 2023, the sectoral HHI stood at 363 points, suggesting a highly competitive market environment. To refine this assessment, several regionally based concentration estimates were produced:

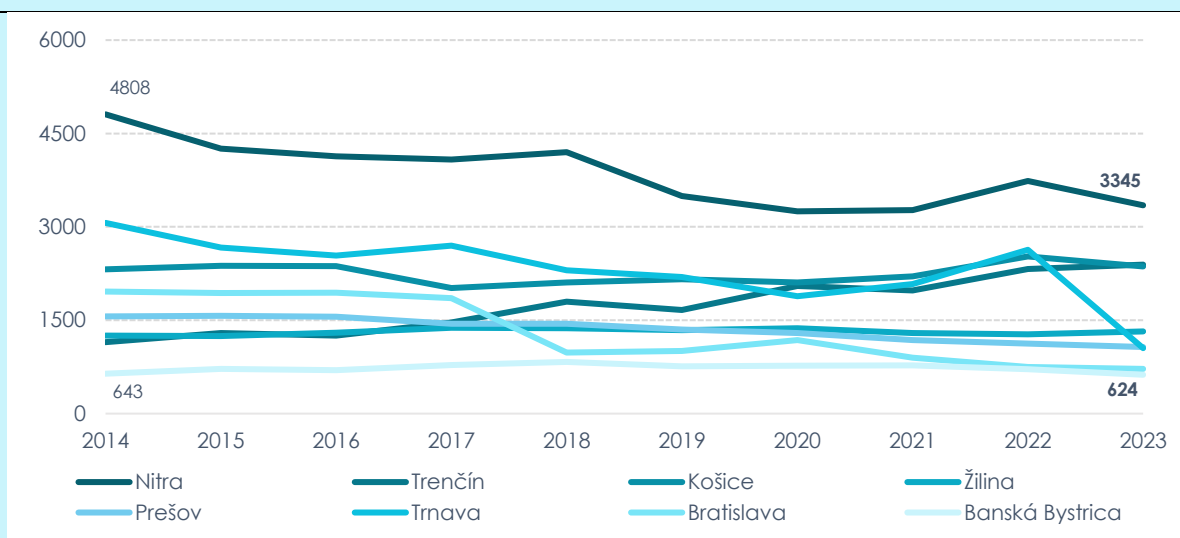
- Estimation based on company headquarters
- Estimation based on wages paid according to the place of work of employees
- Estimation based on firm's turnover derived from the place of work of employees

Estimation based on company headquarters

This approach relies solely on firms' registered headquarters and does not capture the fact that a company may operate multiple facilities in different regions. The values of regional concentration differ considerably, with a slight downward trend observable in most regions (see Figure 7_1). However, this method substantially overestimates concentration, most notably in the Nitra region, where Penam Slovakia has its central office.

⁷⁸ Zákon č.187/2021 o ochrane hospodárskej súťaže, § 3, ods. 9 zákona.

Figure B7_1 – Regional concentration index based on company headquarters location



Source: Author's own calculations based on data from the Register of Financial Statements

Estimation based on wages paid according to the place of work of employees

Economic literature typically employs turnover to calculate sectoral concentration ratios. While turnover data at the facility level are not available, data on total wages paid by place of work (as a proxy for company establishments) are accessible. Since in bread production personnel costs represent between 72% and 83% of value added (production), wages provide a reasonably reliable proxy for regional production. This estimate indicates that regional concentration levels are several times higher than national averages (see Table B7_1). Nevertheless, **with the exception of the Nitra region, the values remain within a range consistent with effective competition** (HHI below 1 500).

Table B7_1 – Regional Concentration Index for year 2023 - wages paid approach

Region	HHI
Bratislava region	1035
Trnava region	564
Trenčín region	751
Nitra region	1690
Žilina region	1130
Banská Bystrica region	753
Prešov region	718
Košice region	1066

Source: Author's own calculations based on data from the Register of Financial Statements and Social Insurance Agency

Estimation based on firm's turnover derived from the place of work of employees

As already noted, direct data on regional turnover at the facility level are not available. However, by combining firm-level turnover data with regional wage

information (by place of work), it is possible to approximate turnover by region. This was operationalised as follows:

- For each firm, the ratio of personnel costs to turnover was calculated from financial statements
- This ratio was applied to the firm's personnel costs disaggregated by region, yielding an estimate of each employee's contribution to firm-level turnover in that region. The contributions were then aggregated at the level of firm and region
- From these estimated "turnover values" by firm and region, concentration ratios were calculated for each region
- In cases where an employer has employees but no data on turnover are available (frequently in the case of self-employed persons), an estimated turnover is imputed. Specifically, the entrepreneur is assigned the average ratio of personnel costs to turnover observed within the size group of firms (defined by the number of employees) to which they belong.

Applying this approach once again reveals higher levels of sectoral concentration compared to the assumption of nationwide firm operations, with three regions now exceeding the Herfindahl–Hirschman Index (HHI) threshold of 1 500 (see Table B7_2). All regionally differentiated approaches to concentration measurement thus result in higher HHI values. Nevertheless, it is important to recall that, due to data limitations, these figures should be interpreted as approximations of the degree of competition. Higher regional HHI scores may also reflect the underlying assumption that production and consumption remain within the given administrative region, with no "exports" across regional borders. This assumption may overstate concentration, particularly in cases where producers located near regional boundaries are likely to sell part of their output outside the region of production. On the other hand, these estimates provide an alternative perspective on competitive conditions, one which at least partially accounts for the regional dimension of production and supply in the sector.

Table B7_2 – Regional Concentration Index for year 2023 - employee location approach

Region	HHI
Bratislava region	1609
Trnava region	948
Trenčín region	812
Nitra region	1953
Žilina region	1442
Banská Bystrica region	1685
Prešov region	936
Košice region	1526

Source: Author's own calculations based on data from the Register of Financial Statements and Social Insurance Agency

3.2 Margins and profitability

The assessment of price transmission within the agri-food supply chain, namely the extent and speed with which price changes are passed through across different stages of the chain, constitutes an important indicator of the efficiency and effectiveness of the chain. To a certain degree, it also reflects the level of competition in food processing and distribution. **The capacity of the food supply chain to adjust to price shocks is a key feature of market functioning, as it reveals its underlying structure, organisation, and characteristics.** Measuring the degree of price transmission helps identify potential market failures. However, such analysis remains challenging, primarily due to the limited availability of reliable and comprehensive data on prices, margins, and cost structures at different stages of the chain.

Price formation in the agri-food supply chain is determined by multiple factors. These include product-specific characteristics (e.g. storability, perishability, seasonality), market structure (intensity of competition, number of intermediaries), as well as public policy measures. Perfect price transmission would imply that price changes at one stage of the chain are immediately and fully reflected in subsequent stages. In practice, however, **the transmission of price changes to final consumers results in varying percentage shifts in the margins of farmers, processors, and retailers, as agricultural raw materials account for only a fraction of the total cost of final products.** Importantly, asymmetries in bargaining power across the chain can significantly affect both the speed and magnitude of price transmission. Such imbalances arise when firms with substantial market power are able to exert pressure on suppliers or buyers through more favourable pricing or contractual conditions. **Stronger competition within the chain can dampen, or even fully offset, the transmission of rising costs to consumers**⁷⁹.

The relationship between concentration and prices is influenced by sector-specific conditions, and should also consider the reverse effect of prices on concentration and efficiency. Recent research suggests that rising margins are not always driven by higher prices but may instead reflect declining costs—at least until the recent surge in inflation⁸⁰. **The sharp increase in margins and historically high profits during periods of inflation has reignited debate about the role of market power in driving price increases. While lower costs are usually the main driver of margin growth, empirical evidence points to a limited degree of pass-through of efficiency gains to consumers**⁸¹. Firms tend to display rent-seeking behaviour, whereby positive cost shocks (e.g. declining input costs) are not fully transmitted to consumers, while negative shocks (e.g. rising costs) are more likely to be entirely reflected in final prices. Recent research on inflation drivers suggests that firms with significant market power were able to substantially raise margins during periods of accelerating price growth. **Supply chain disruptions not only accelerated the pace of inflation but also shaped inflation expectations, enabling dominant firms to maintain, and in some cases further expand,**

⁷⁹ Deconinck, K. (2021). „Concentration and market power in the food chain“.

⁸⁰ Conlon, C. - Miller, N. - Otgon, T. - Yao, Y. (2023). „Rising markups, rising prices?“

⁸¹ Kouvavas, O. - Osbat, Ch. - Reinelt, T. - Vansteenkiste, I. (2021). „Markups and inflation cyclicalities in the euro area“.

their margins⁸². This raises the question of the extent to which firms operating on the Slovak market hold sufficient market power to employ such strategies, and whether the growth in margins has contributed to the overall increase in the price level.

Nevertheless, the existence of margins per se should not necessarily be regarded as negative. **Higher margins may reflect the returns on intangible assets such as R&D investments, or the need to cover fixed and overhead costs**⁸³. In such cases, elevated margins can support technological innovation, encourage investment in modernisation, and contribute to productivity growth. Moreover, in sectors characterised by high fixed costs, higher margins are often necessary to ensure cost recovery and long-term financial sustainability.

Empirical evidence indicates that, across EU economies, **the increase in average margins over the last two decades has been primarily driven by firms positioned at the upper end of the distribution chain (wholesale and retail), particularly those with the largest market shares**. By contrast, at the lower end of the chain (agriculture and food processing), trends remained broadly stable. In Slovakia, these findings apply only partially⁸⁴. The rise in food prices during 2022 and 2023 enabled a significant but short-lived increase in profitability along the food chain. **Company accounts suggest that profitability during the inflationary crisis increased most notably in agriculture and food processing**. In terms of profitability, agriculture performed particularly well in 2022, while food manufacturing strengthened in 2023⁸⁵.

From the perspective of profit margins, the highest levels in 2022 were recorded in agriculture. While pre-pandemic profitability in the sector ranged between 2 and 5%, farmers experienced a sharp increase from 2020 onwards, peaking in 2022, when average margins reached 12% (see Figure 36). This trend was supported by the rise in global agricultural commodity prices, which outpaced the growth in production costs. Instability in international markets, caused by supply chain disruptions following Russia's war of aggression against Ukraine, also played a decisive role. **Slovak farmers were able to take advantage of the situation, selling their stocks abroad during the commodity price peaks. However, once international markets stabilised, their average margins returned to around 4%.**

The food-processing industry displays mixed results. In the beverage sector, both gross and net profit margins declined over the last decade. Compared with their peak in 2019, profitability fell by 1,07 percentage points, reaching 6,98% in the most recent year. It is expected that the future development of profitability within the sector will be significantly influenced by the increase in value-added tax (VAT) as well as by the introduction of a new excise duty on sugar-sweetened beverages. These fiscal measures are likely to exert upward pressure on production and retail costs, potentially

⁸² Acharya, V. - Crosignani, M - Eisert, T. - Eufinger, C. (2023). „How do supply shocks to inflation generalize? Evidence from the pandemic era in Europe.“

⁸³ De Loecker, J. - Eeckhout, J. - Mongey, S. (2021). „Quantifying market power and business dynamism in the macroeconomy“.

⁸⁴ European Commission (2024). „Protecting competition in a changing world - Evidence on the evolution of competition in the EU during the past 25 years“.

⁸⁵ Ministry of Finance of the Slovak Republic (2024). „Analýza cenového vývoja základných druhov potravín 9/2024“.

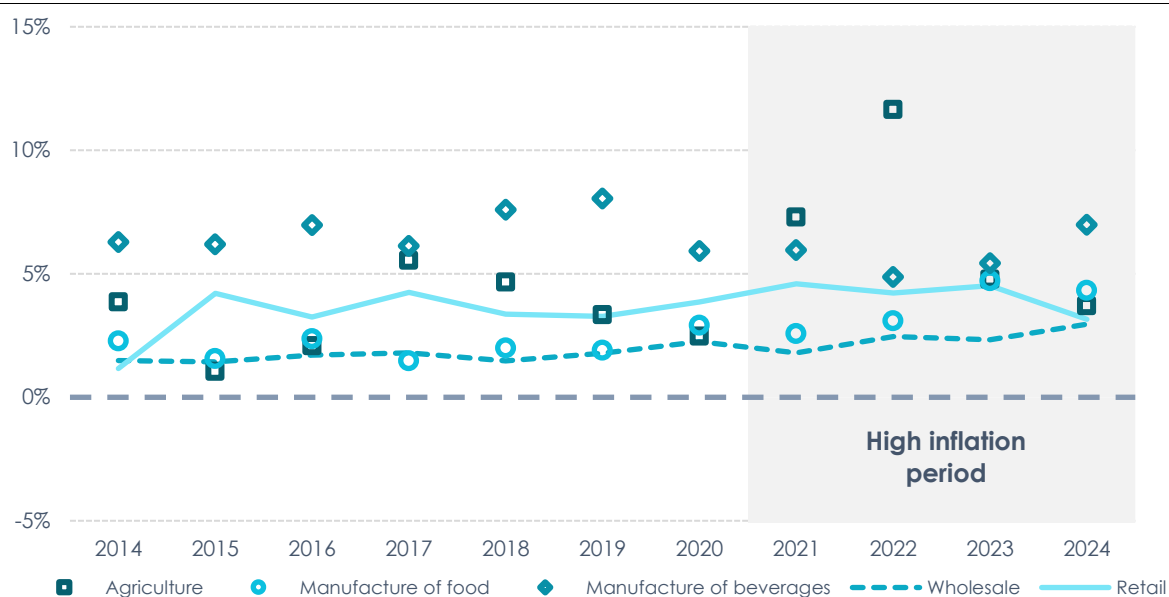
constraining profit margins, particularly among smaller enterprises with limited capacity to absorb additional tax burdens. Conversely, in the food manufacturing sector, profitability has increased significantly since the onset of the pandemic, from approximately 2% in the pre-pandemic period to the current level of 4,33%. **Food manufacturers more than doubled their profitability during a period of accelerating food inflation, thus, in addition to rise in cost of inputs, increased profitability contributed also to overall price growth. This development is closely linked to market structure, as the food-processing industry in Slovakia is characterised by a high degree of concentration, a relatively limited number of firms, and constrained production capacity.** Under conditions of cost shocks, these structural features translated into stronger price increases, while limited competition reduced the pressure to absorb higher costs within firms' margins.

In contrast, wholesale and retail have maintained relatively stable profitability levels in recent years, with only marginal increases. In retail, the growth in profit margins since 2020 has ranged between -0,37 and +0,74 percentage points. In wholesale, average margins rose by only 0,07 percentage points over the same period. These developments suggest that the global price shock in food markets primarily raised profits in primary production and subsequently transmitted to processing industries. **Moreover, in 2024, the profitability of the majority of retail chains operating in the slovak market experienced a significant decline.** This development was driven by a combination of factors, notably the persistent rise in food prices, which substantially influenced consumer behavior, increasing labor costs, and intensified competitive pressures within the sector.

The entry of a new market player appears to have prompted established chains to adopt a more aggressive pricing strategy. **Strengthened competition simultaneously reduced retailers' ability to fully pass on rising costs to consumer prices, resulting in margin compression and a subsequent decline in profitability.** Available data indicate that the average profit margin in the retail sector fell from 4.52% to 3.16% year-on-year, representing an approximate 30% reduction in profitability. This trend clearly suggests that, in an effort to maintain or strengthen their market positions, retailers had to reduce their margins and absorb a portion of cost shocks through internal measures rather than transferring them to end consumers. These patterns underscore the high degree of competition in slovak retail, characterized by relatively low margins, which limits the sector's ability to raise prices above additional costs.

The findings also challenge the frequently cited narrative in public discourse attributing food price increases primarily to retail chains. Profit margins appear relatively stable, indicating that, in multiple periods, retail chains absorbed a portion of cost shocks. Consequently, **the retail sector acted not as an inflationary driver but rather as a buffer against sharp price increases, a perspective that should be reflected in the broader public discussion on the drivers of food inflation.**

Figure 36 - Retailers did not benefit from the sharp rise in prices, while processors managed to more than double their profitability



Note: The profit margin is calculated as the ratio of profit before tax to the total output of the sector.

Source: Author's own calculations based on data from the Register of Financial Statements (data updated on 10/2025)

In 2023, the highest gross margins in Slovakia were recorded in food processing, closely followed by agriculture (see Figure 37). At the other end of the spectrum, wholesale has persistently shown the lowest gross margins. In 2023, the average gross margin in wholesale amounted to only 8%, which directly constrained profitability levels. **While margins at the lower end of the distribution chain remain relatively volatile and display no clear long-term trend, the upper segments, particularly retail and wholesale, show a mild but systematic upward trend in gross margins.** An interesting phenomenon is observed in the retail sector, where gross margins declined only slightly between 2021 and 2022 (by about 0,5 percentage points), before returning to growth in 2023. This suggests that retailers were able to optimise operations and manage costs efficiently even during economic downturns and inflationary periods. **Sectors that are more sensitive to price shocks exhibit stronger margin volatility, but often compensate downturns with subsequent periods of robust growth.** Agriculture and some branches of food processing are illustrative examples, where sharp declines in margins are often followed by corrections that exceed earlier losses. The differentiated volatility of margins is closely linked to a range of sector-specific factors that influence food markets as a product category (see Box 8).

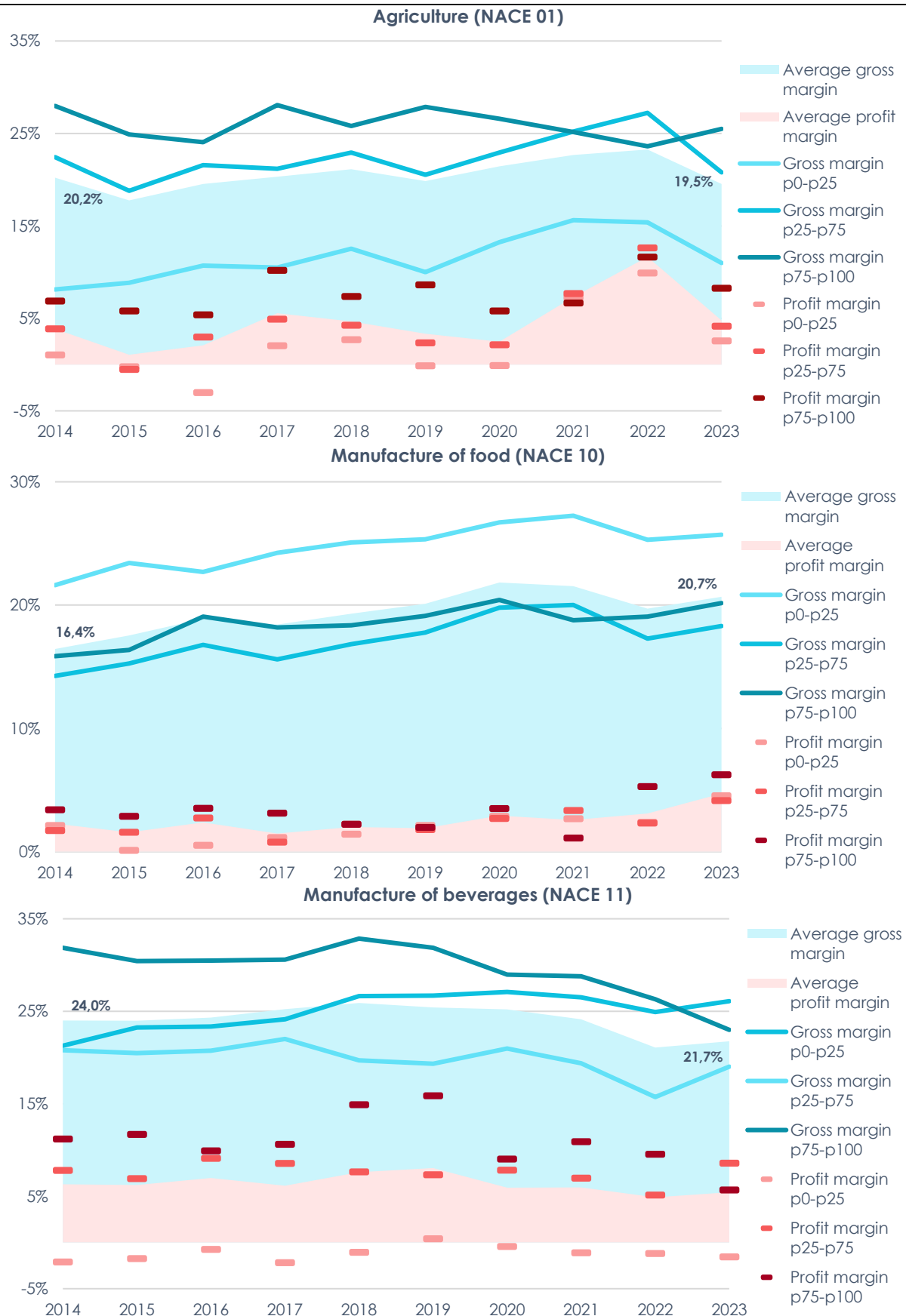
The retail sector in Slovakia has not been exposed to negative economic shocks to the same extent as agriculture or the food-processing industry, which are more sensitive to market fluctuations and external factors affecting production. The continuous growth in food consumption, and the rising share of food in total household expenditure, have contributed to margin growth in retail. Over the observed period, nominal food consumption in Slovakia increased at a faster pace than in neighbouring

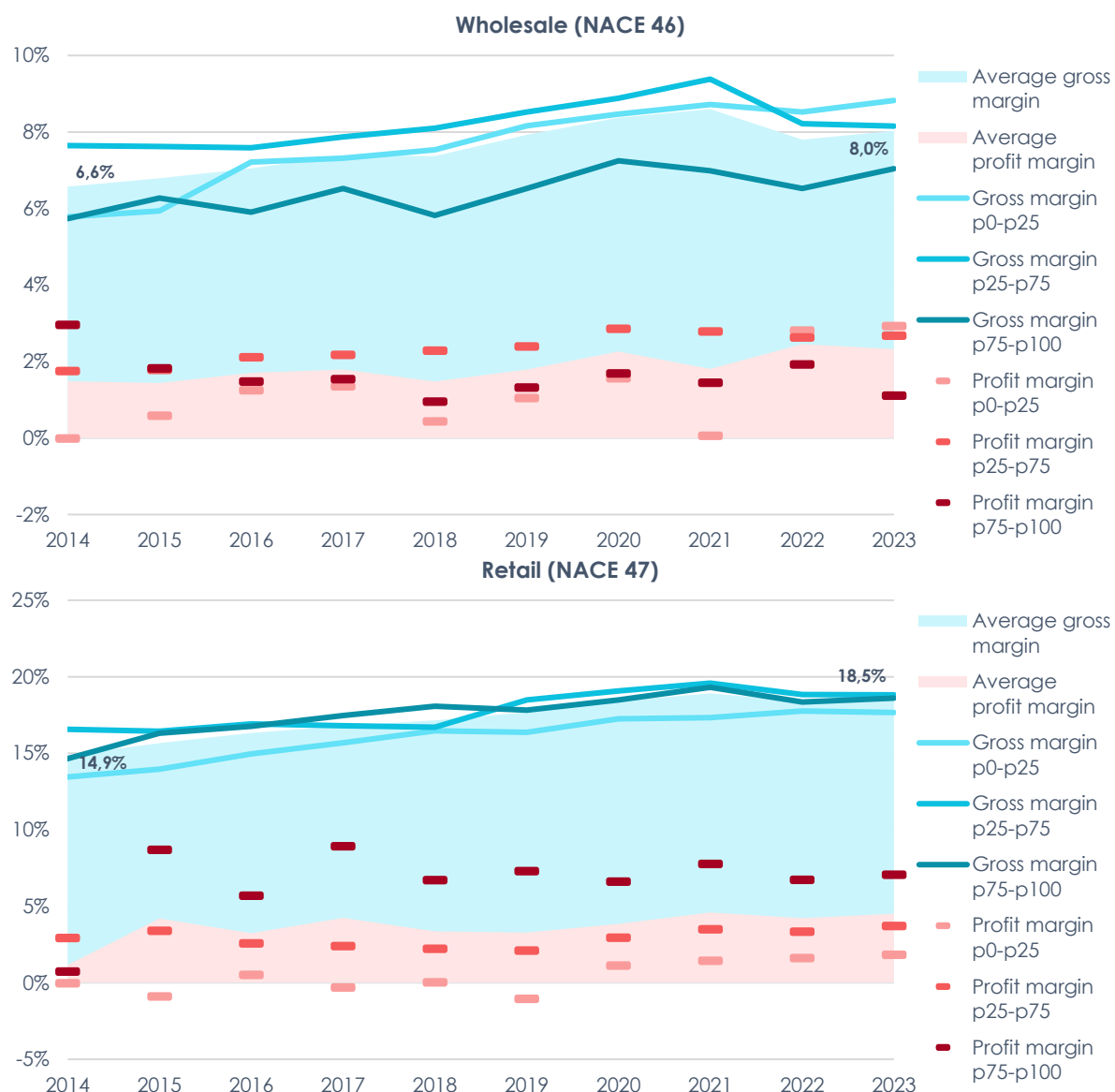
countries. **This systematic development of margins suggests that retailers have not been the main drivers of disproportionate price increases during inflationary episodes.**

An analysis of margin structures further reveals that the largest firms do not always record the highest gross margins. In food processing and wholesale, higher margins are more frequently observed among smaller firms. In retail, gross margins are broadly comparable across small, medium, and large enterprises. Over the past decade, gross margin developments have evolved in parallel, and today gross margins are nearly identical across all size categories.

More nuanced results emerge when analysing profit margins by market share. Here, **the largest firms record the highest profitability in most food-related sectors.** This phenomenon is likely linked to higher labour productivity, more efficient resource allocation, cost optimisation, and greater returns on investment. With the exception of wholesale, the largest firms consistently achieve profit margins above sectoral averages. The most significant difference between market leaders and smaller firms is observed in retail. In 2023, leading retailers achieved an average profit margin of 7,05%, compared with only 2% among small firms in the sector. **Moreover, negative profit margins are more frequently observed among smaller firms, particularly in agriculture, beverage manufacturing, and retail.** This may reflect higher investment needs for growth, lower efficiency in resource use, or a relatively high wage bill in proportion to value added. In order to compete with larger firms, smaller enterprises often need to offer competitive wages, despite lower productivity levels, which further reduces their room for profitability. **These observations suggest that overall sectoral profitability is significantly shaped by a small number of large firms, while the large group of smaller enterprises exerts a downward effect on average profitability levels.**

Figure 37 - Profit margins grew mainly in large firms, while profitability among small firms has been lagging behind





Note: The margin breakdown is based on the percentile distribution of firms according to their market share. The gross margin reflects the ratio of gross value added to total sales of firms in a given year and sector. Profit margin expresses the share of gross operating surplus in firms' total sales

Source: Author's own calculations based on data from the Register of Financial Statements

An analysis of price transmission within the slovak agri-food supply chain indicates that **the efficiency of price pass-through depends only partially on competition and the market structure of individual segments**. Large enterprises are better positioned to adjust prices flexibly to their advantage. By contrast, smaller firms face higher unit costs, which limits their ability to remain competitive. The uneven distribution of margins demonstrates that, while **smaller firms may achieve gross margins comparable to larger enterprises, their profitability remains lower**. This is primarily due to lower labour productivity, stemming from a higher number of employees per unit of output. Larger firms, by contrast, benefit from economies of scale, which confer a significant competitive advantage. With relatively fewer employees, a greater share of their gross margin translates into profit. **Unless smaller firms succeed in optimising workforce levels and increasing production efficiency, they are likely to lose market share to larger**

competitors. This trend could reinforce the market power of dominant firms, potentially undermining market dynamics, constraining competition, and strengthening concentration at the expense of smaller market participants. **Over the longer term, such concentration could weaken the overall sector, lead to the exit of smaller enterprises, reduce market diversity, and limit consumer choice.**

These findings also challenge a frequently repeated narrative in the public debate, which attributes food price growth primarily to retail chains and their allegedly high margins. In practice, such margins largely reflect higher labour productivity and lower unit costs compared to smaller actors in the retail sector. **Empirical evidence on the development of profit margins indicates that retail chains did not play a primary role in driving food inflation.** On the contrary, margins remained broadly stable or increased only moderately. In combination with rising input costs, this suggests that retailers often absorbed part of the cost shocks. **Retail therefore did not act as an inflationary driver but rather as a buffer against rapid price increases. This aspect should be more systematically reflected in the wider public debate on the causes of food inflation.**

Box 8 – Do rising margins drive food price growth? Evidence and insights

According to a study by the National Bank of Slovakia (NBS), **the increase in food prices largely reflects the rise in input costs in food production.** The study further indicates that price growth in the food-processing sectors has exceeded the growth in costs, resulting in widening profit margins. **These margin increases have been observed not only in Slovakia but also in other EU Member States.** Food price inflation has risen markedly across all EU countries⁸⁶.

Empirical evidence suggests that asymmetric price transmission of shocks, leading to a temporary increase in margins, tends to be the rule rather than the exception. **Agricultural and food markets across different countries and over extended periods show that increases in producer prices are typically passed through more rapidly and fully to consumer prices than decreases in producer prices.** Such asymmetric transmission may arise due to adjustment costs, so-called menu costs (i.e. costs of changing prices), information asymmetries, inventory management strategies by retailers, government interventions, firm-level intertemporal optimisation, economies of scale, interaction between markets, demand and supply characteristics of food products, the share of food expenditure in total household consumption, and other structural factors⁸⁷.

The European Commission has identified several drivers that may explain why price changes at the level of agricultural producers do not always fully or immediately transmit along the value chain, particularly at the retail level in the short run.⁸⁸ These include:

- **Menu costs and price levelling practices:** retailers and other actors in the chain often absorb part of the cost changes occurring upstream in order to avoid frequent adjustments of retail prices. This strategy reduces the costs of repricing and accounts for the uncertainty about whether an exogenous price shock is temporary or permanent. It is particularly relevant when shocks are driven by short-term developments;
- **Limited shelf life of certain food products:** to avoid losses due to perishability, firms may adjust prices more frequently. This factor is especially relevant for products with short consumption cycles;
- **Internationalisation of price fluctuations:** in cases of predictable input price swings or in the context of long-term contracts, firms may prefer to stabilise retail prices to maintain market share;
- **Number of vertical stages in the chain:** longer value chain can result in delays in price transmission and adjustment, complicating the dynamics of pass-through;

⁸⁶ Casalis, A. (2023). „When food bites back – What quarterly firm-level data reveal about food inflation“.

⁸⁷ Ministry of Agriculture and Rural Development of the Slovak Republic (2023). „Analýza a odporúčania k riešeniu potravinovej inflácie na Slovensku“.

⁸⁸ European Commission (2009). „Analysis of price transmission along the food supply chain in the EU“.

- **Geographical dispersion of the food chain:** asymmetric price transmission often arises in local markets with limited retail competition, such as regions with a small number of outlets. Conversely, producers may be constrained to source inputs from proximate markets, creating further rigidities;
- **Inventory management practices:** timing of price adjustments is influenced by stock management methods, such as FIFO (first-in, first-out) or LIFO (last-in, first-out), which affect how products move from inventory to sale;
- **Risk of price wars:** firms may be reluctant to reduce prices if such actions are likely to trigger aggressive competitive responses;
- **Public interventions and regulation:** government measures aimed at supporting producer prices or regulating supply may also create asymmetries. Firms may expect intervention in the event of sharp price declines, or they may face intensified competition over access to subsidised inputs.

These factors demonstrate that price transmission along the food supply chain is shaped by a complex set of economic, structural, and regulatory conditions, which often lead to asymmetries and lags in practice.

According to analysis by the European Central Bank (ECB), **food inflation tends to be higher than non-food inflation because margins in the food sector are lower compared to other sectors.** The ECB further observes that **inflation in high-margin sectors is generally less volatile than in low-margin sectors. Inflation in high-margin industries responds less strongly to supply shocks,** global demand shifts, and euro area monetary policy shocks. This suggests that margins in the food sector are structurally lower than in other sectors, which helps explain why food prices have increased more sharply than prices of other goods.⁸⁹

⁸⁹ Kouvavas, O. - Osbat, Ch. - Reinelt, T. - Vansteenkiste, I. (2021). „Markups and inflation cyclicality in the euro area“.

3.3 Productivity and labour costs

Labour productivity and labour costs represent key determinants of the competitiveness and sustainability of firms in industrial production. Their evolution, and the disparities observed between enterprises of different sizes and ownership structures, can significantly influence market dynamics, investment decisions, and wage growth. In Slovakia, substantial differences are evident, affecting not only individual firms but also the broader economic structure of the country.

According to a recent study by Morvay (2020), **considerable disparities exist in Slovakia regarding labour productivity and costs within industrial production, depending on firm size and ownership structure.** For example, in 2017, labour productivity in large enterprises (over 250 employees) was nearly four times higher than in the smallest firms (fewer than 10 employees). This gap has widened, primarily due to stagnation or decline in productivity among small firms, thereby increasing the disparity between different economic segments. While differences in labour costs are less pronounced than in productivity, the ratio of average labour costs to productivity in small firms has gradually increased, indicating a highly limited capacity to raise wages without substantial productivity growth. By contrast, large enterprises maintain a lower ratio of labour costs to productivity, providing them with a competitive advantage over smaller firms⁹⁰.

These patterns are also observable within the Slovak agri-food sectors (see Figure 38). **Labour productivity and nominal wages have exhibited a long-term upward trend with limited volatility,** except for year-on-year fluctuations in agricultural productivity during 2021-2023 period. These fluctuations were driven by price shocks in agricultural commodities, which temporarily increased measured productivity. Among the sectors, the beverage manufacturing industry exhibited the highest labour productivity, followed by wholesale trade, while agriculture recorded the lowest productivity, with less than 22 thousand euros per employee in 2023.

Over the past decade, nominal productivity in agriculture, food manufacturing, and retail has more than doubled compared to 2014 levels. Analysis of productivity distribution by firm market share indicates that, **across all segments of the agri-food value chain, larger enterprises consistently exhibit higher productivity levels.** This trend, observable from the initial year of the study and persisting through 2023, reflects the ability of large firms to utilise production resources more efficiently, benefiting from economies of scale, higher levels of investment, and more effective division of labour. **With the exception of the wholesale sector, large firms have maintained stable productivity gaps relative to smaller enterprises.**

Trends in labour costs largely mirror productivity developments, though sectoral differences exist. In 2023, the lowest labour costs were observed in retail, followed by agriculture. In agriculture, however, labour costs (except for 2021–2023) exceeded

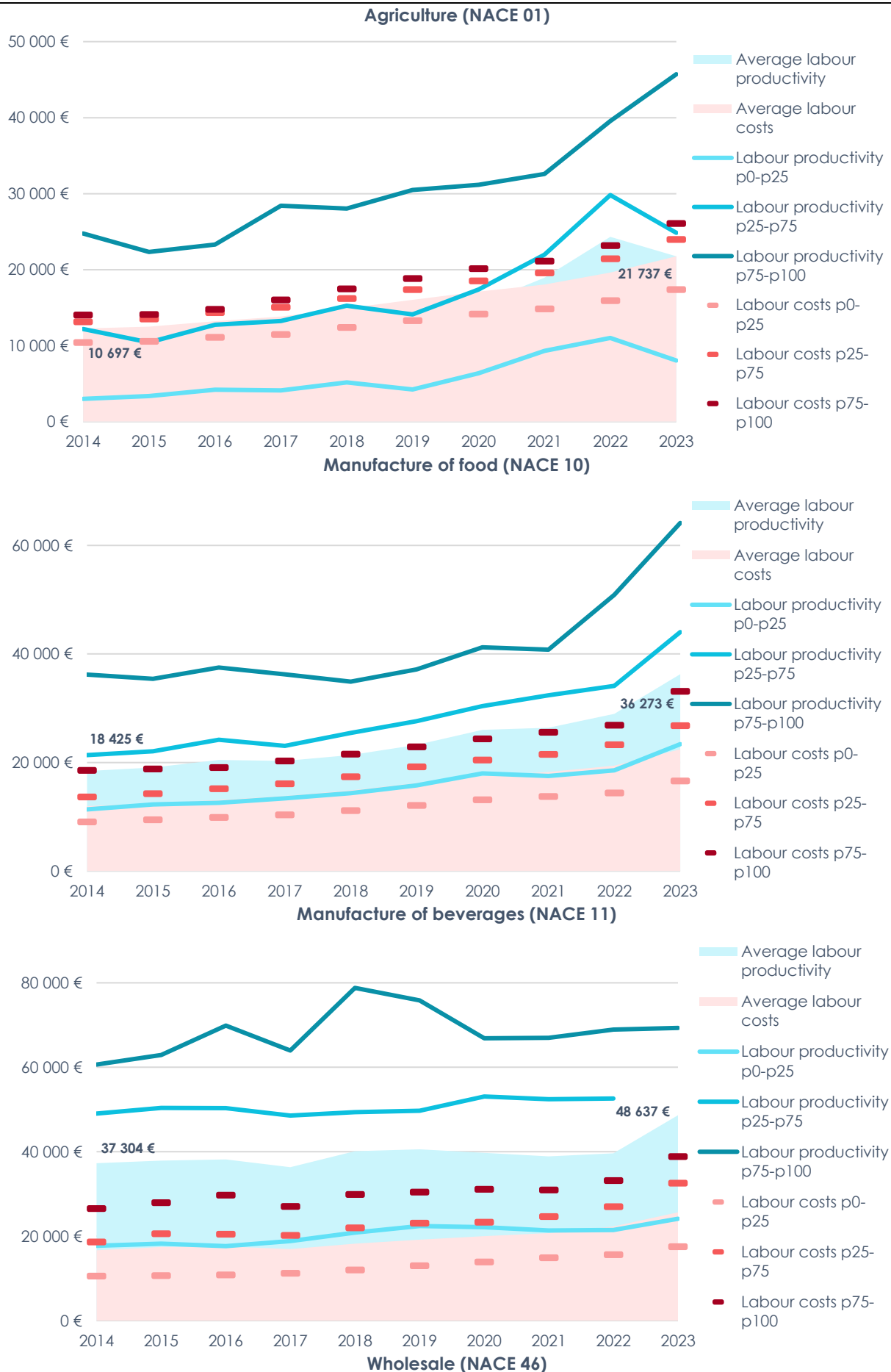
⁹⁰ Morvay, K. (2020). „Slovenská ekonomika na ceste od nedostatku práce k nedostatku jej produktivity“.

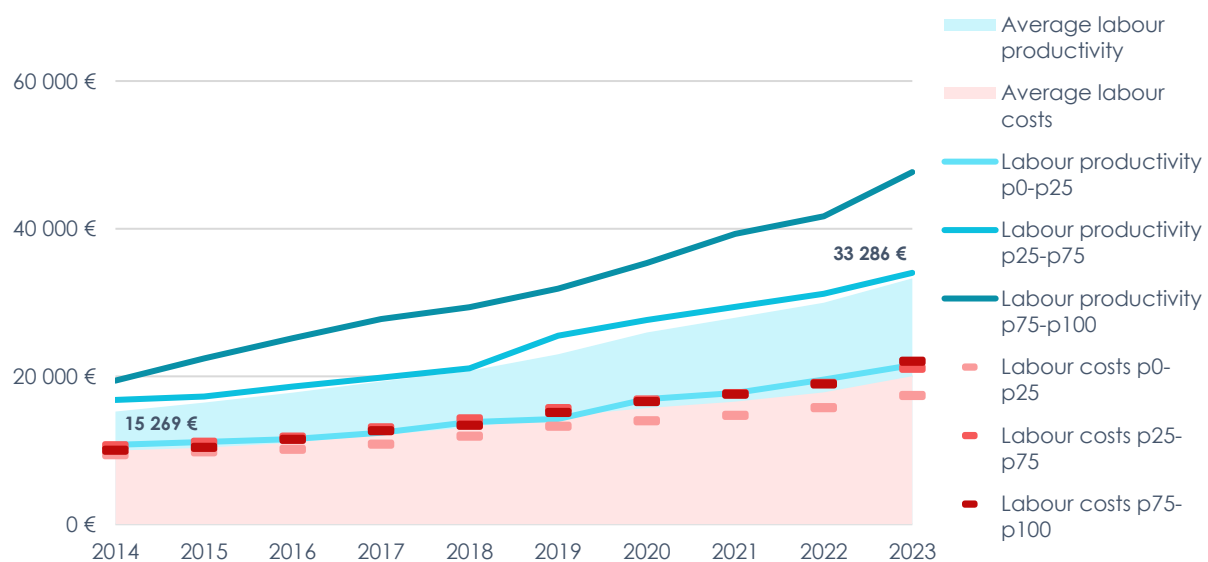
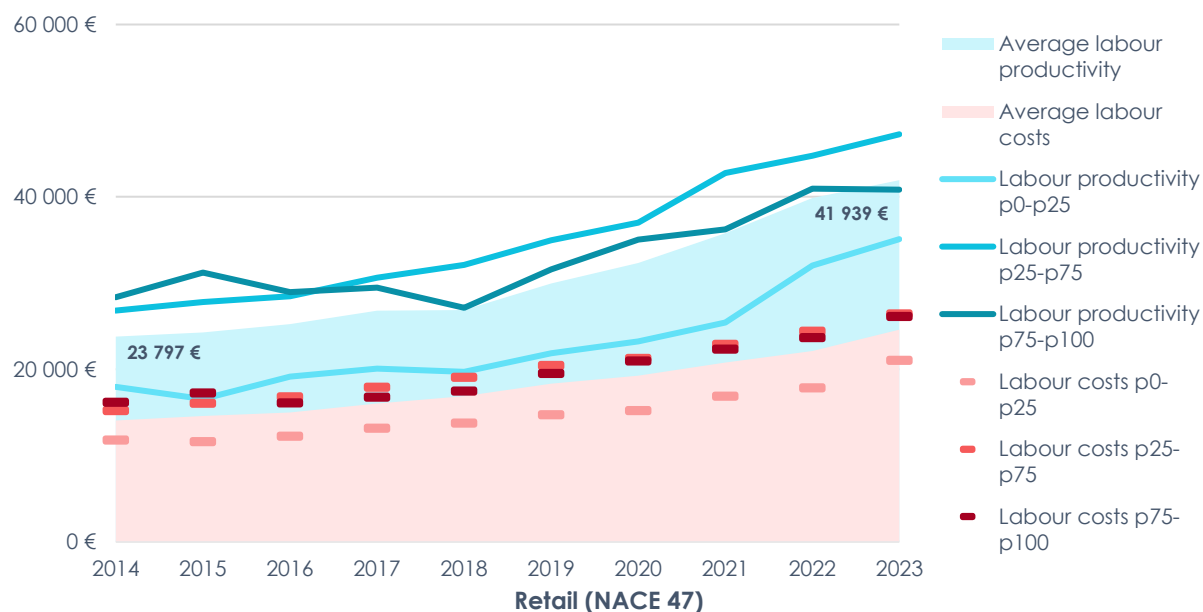
productivity, indicating that the value added per employee is insufficient to cover wages, a key justification for agricultural subsidies.

Conversely, the highest labour costs were recorded in the beverage manufacturing sector, likely due to higher skill requirements. **Distributional patterns also indicate that the largest firms incur the highest wage costs. These firms can afford higher wages because their productivity is substantially higher than that of small and medium-sized enterprises (SMEs).** Elevated wages in these firms likely reflect not only a more skilled and specialised workforce but also strategic efforts to attract and retain qualified employees.

Notably, **differences in wage levels between large and small firms are less pronounced than differences in labour productivity.** Small firms are often compelled to raise wages to the limit of their value added in order to remain competitive in the labour market. **This phenomenon is particularly evident in retail, where wage costs in the smallest firms approach the level of their productivity.** In agriculture, only the largest firms can sustainably achieve productivity exceeding labour costs, while differences in wage levels between small, medium, and large firms remain limited. The scope for wage growth in small firms is therefore very constrained and practically unfeasible without substantial productivity gains. **In contrast, large firms experience a declining ratio of labour costs to productivity, enhancing their competitive advantage relative to smaller market participants.**

Figure 38 – Large firms pay higher wages due to stronger productivity growth





Note: The breakdown of labour productivity and labour costs is based on the percentile distribution of firms according to their market share. Labour productivity and labour cost values are expressed per employee according to the average employment of firms in a given year and sector

Source: Author's own calculations based on data from the Register of Financial Statements

Labour productivity in slovak industry is strongly influenced by a small number of the largest enterprises. In large firms, often under foreign ownership, revenue per employee is substantially higher than in smaller, domestically owned companies. These firms are characterised by mass production, advanced technologies, high levels of capital intensity, and a strong presence in international markets. According to Morvay (2020)⁹¹, labour productivity in these large enterprises is two to four times higher than in domestically owned firms. Despite this, wages in large firms have increased only moderately compared to domestic companies, indicating that a significant portion of the added value generated by higher productivity is not reflected in wage growth but is instead reinvested in innovation, expansion, and long-term enterprise development. **For sustainable wage growth in Slovakia, it is therefore essential that high productivity in large firms gradually translates into smaller and less productive enterprises.** This process could enhance the overall competitiveness of the economy, support stable growth in employee incomes, and promote long-term economic sustainability.

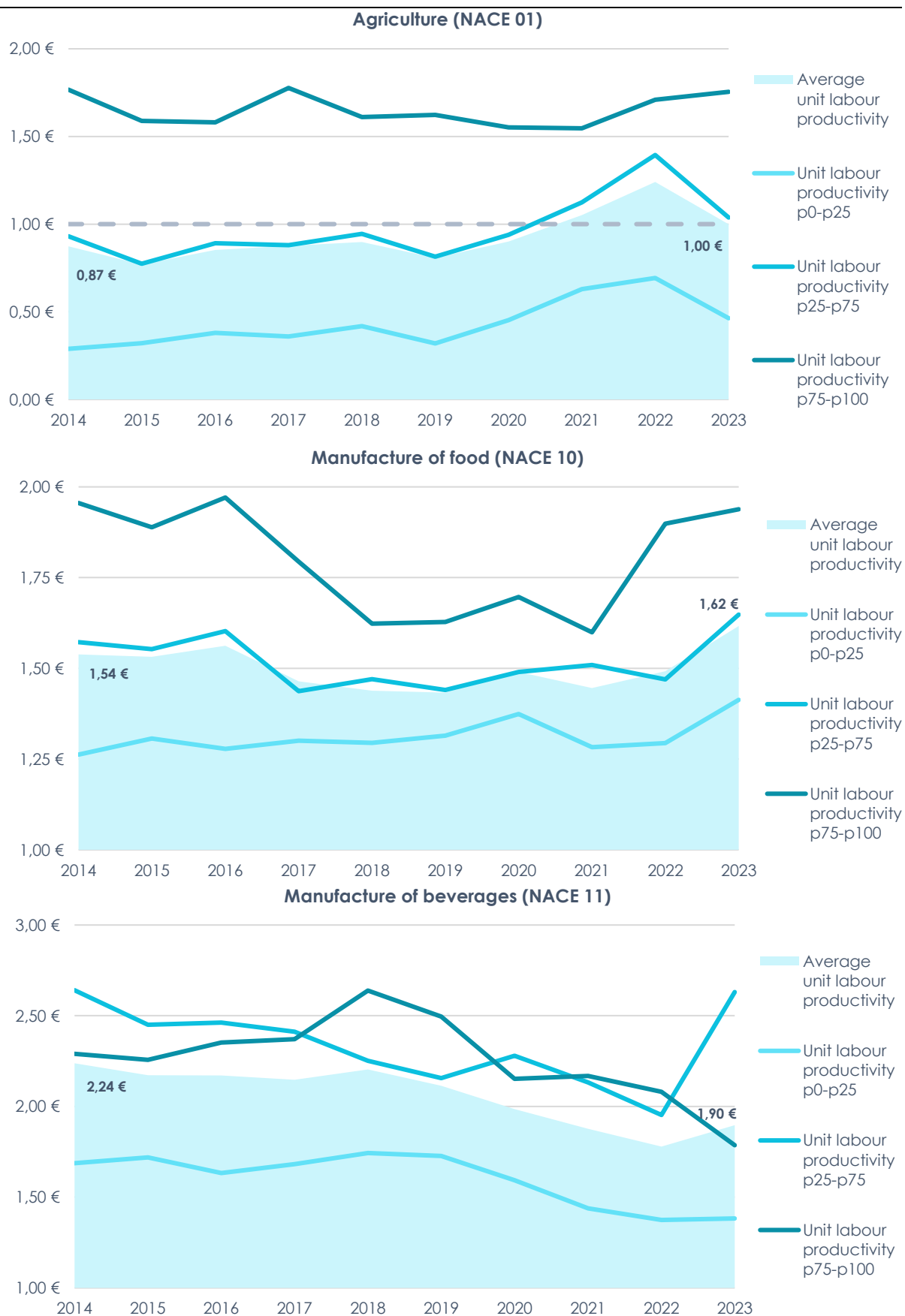
In the agri-food sectors, the situation differs, with distinct trends in unit labour productivity. The highest average levels of unit labour productivity are observed in the processing industries (see Figure 39). While productivity in the food manufacturing sector has stagnated with modest growth since 2020, the beverage manufacturing sector has experienced a long-term decline, with normalized unit productivity falling from 2,24 to 1,90 euro over the past decade.

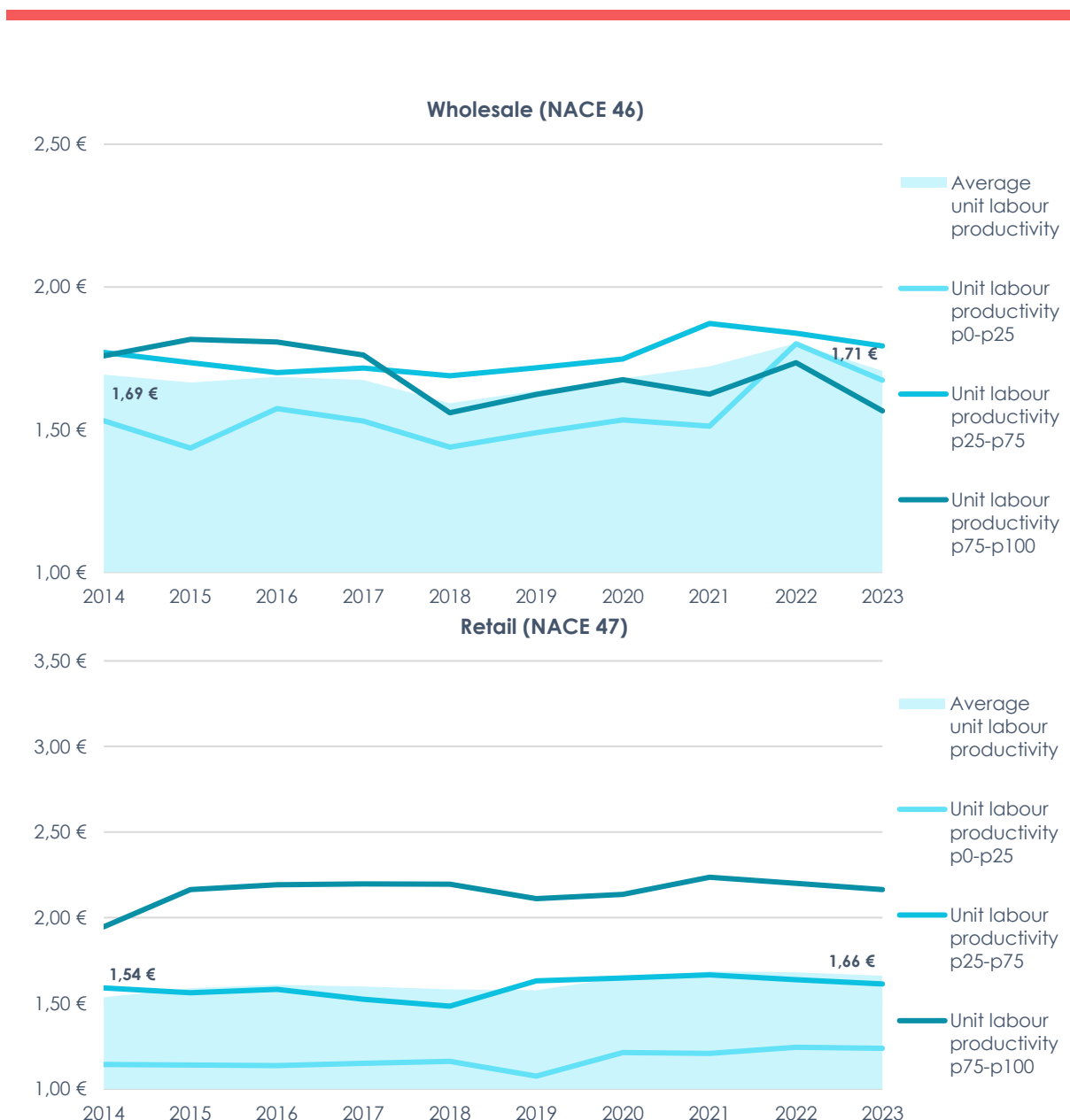
Service sectors have shown no significant changes in productivity, with only a slight increase observed since 2019. The agricultural sector has exhibited gradual productivity growth, with a notable inflection point in 2020 when unit productivity exceeded 1 euro. **This increase indicates that the agricultural workforce can generate sufficient added value to cover labour costs. Nevertheless, agriculture remains a sector with a high reliance on subsidy schemes, which offset production costs to maintain price competitiveness.** Without this financial support, the generated added value would be entirely absorbed by wages, leaving no room for savings or future enterprise development. Prior to 2020, the added value generated in slovak agriculture would have been insufficient even to cover employee wages.

An additional perspective is provided by the distribution of unit labour productivity according to firm market share. **Firms in leading market positions consistently achieve the highest unit productivity levels.** This trend is observable across all segments of the agri-food value chain, highlighting the importance of efficient resource utilisation, investment in technology, and labour optimisation for enhancing productivity and overall competitiveness.

⁹¹ Morvay, K. (2020). „Slovenská ekonomika na ceste od nedostatku práce k nedostatku jej produktivity“.

Figure 39 - Labor productivity is highest within market leaders, while mixed trends has been recorded elsewhere





Note: The decomposition of unit labour productivity is based on the percentile distribution of firms according to their market share. Unit labour productivity is the ratio of labour productivity to labour costs per employee in a given sector. It is the reciprocal value of the unit-labour-costs indicator

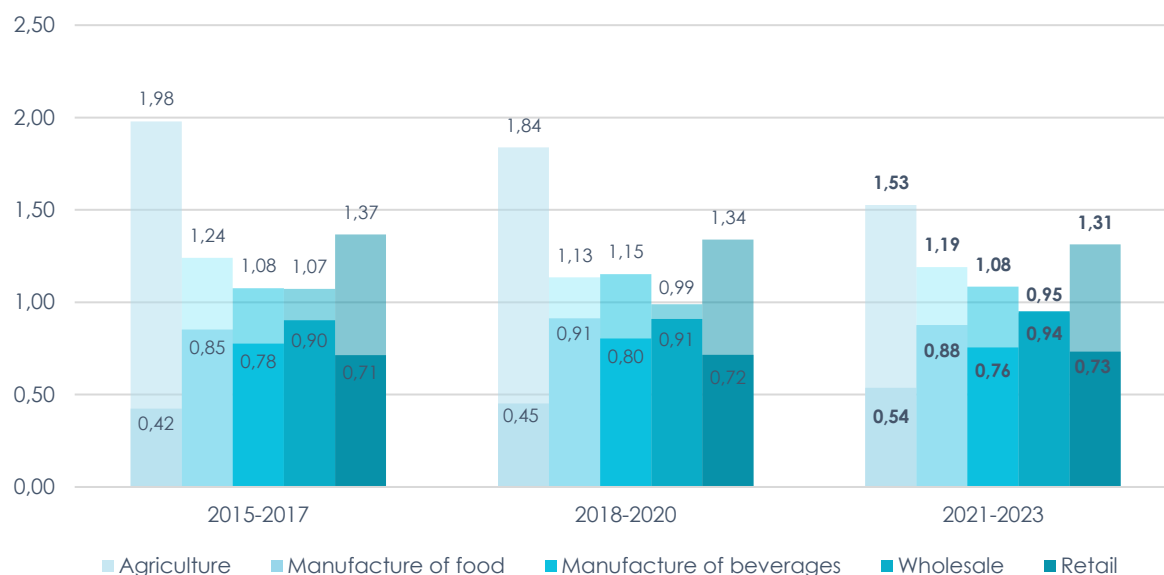
Source: Author's own calculations based on data from the Register of Financial Statements

The disparity in average labour productivity between market leaders and the smallest enterprises is particularly pronounced, with this inequality being especially evident in the agricultural and retail sectors (see Figure 40). During the period 2015–2017, the largest agricultural firms achieved labour productivity at 1,98 times the sectoral average, whereas the smallest enterprises recorded only 0,42 times the average. This indicates that the largest firms were nearly five times more productive than their smallest competitors. A substantial difference was also observed in the retail sector, where the largest firms achieved productivity 1,37 times higher than the sectoral average over the same period. By contrast, the most uniform distribution of labour productivity across firm sizes was observed in wholesale, where differences between firms of varying size were comparatively modest.

This trend of uneven productivity persisted in subsequent periods, although a gradual convergence became apparent. Between 2021 and 2023, the largest retail firms achieved only 1,31 times the sectoral average productivity, suggesting a gradual narrowing of differences. A similar pattern was observed in agriculture, where the productivity of the largest firms reached 1,53 times the sectoral average, while the smallest firms achieved 0,54 times the average. **Although this still represents nearly a threefold gap between leaders and smaller firms, it constitutes a positive shift compared to the previous period.** Comparable developments occurred in the wholesale and manufacturing sectors, albeit with more moderate intensity.

A key factor in further reducing productivity disparities is supporting the transfer of productivity gains to medium-sized and smaller enterprises. This process requires strategic investment in both physical and human capital, which may include modernising production processes, digitalisation, improving management practices, and enhancing the skills of the workforce. **Although Slovakia has already experienced gradual convergence of labour productivity across firms of different sizes, significant differences remain between market leaders and smaller enterprises,** with the exception of the wholesale sector. Ensuring the long-term competitiveness of the entire economy will require continued support for measures that promote a more efficient distribution of productivity across sectors.

Figure 40 - Productivity gaps between large and small firms are narrowing, but still remain quite wide



Note: The value of the indicator reflects the ratio of the unit labour productivity of the bottom and top 25 percent of firms (based on the firms' market share distribution) to the average unit labour productivity of firms in a given sector. Values reflect sectoral average on the basis of a three-year periods

Source: Author's own calculations based on data from the Register of Financial Statements

The scope for wage growth is closely linked to developments in labour productivity. Achieving higher productivity requires substantial capital investment, which supports technological advancement and more efficient production processes. The total

volume of cumulative investment in tangible and intangible assets that enter the production process can be defined as capital. When considered relative to the workforce, this concept is referred to as capital intensity of labour, reflecting the amount of capital allocated per employee. An increase in profit margins naturally reduces the relative share of labour, as firms optimize their operations. When margin growth results from lower input costs, for instance through cheaper technology relative to wage costs, it should encourage greater adoption of capital and, consequently, higher capital intensity per worker⁹².

Higher capital intensity enables more efficient utilisation of production factors, thereby fostering productivity growth until the marginal product reaches zero. However, investments in capital require sufficiently high value-added generation to allow for savings and financing of fixed capital. **Given that the gap between labour productivity and wage costs is more pronounced in firms with the largest market shares, these enterprises have greater capacity for investment**, which translates into higher capital intensity and further productivity gains, lower unit production costs, and strengthened market positions.

Firms operating in highly competitive markets face pressure to optimise production processes to gain an advantage through lower prices or higher product quality, thus supporting overall economic growth and social welfare⁹³. Conversely, **in less competitive markets, dominant players may acquire greater market power, potentially leading to suboptimal production levels and price increases**. Accordingly, it is critical that the increase in capital intensity occurs across all sectors rather than being concentrated solely among large enterprises.

Over the past decade, average capital intensity has increased across all sectors of food production, with the most pronounced growth observed in retail, which experienced cumulative growth of 71% (see Figure 41). By contrast, the lowest increase occurred in the beverage manufacturing sector, reflecting its already high initial level of capital intensity. **Similar to trends observed in labour productivity and wage levels, firms with the largest market shares exhibit a substantial lead in capital intensity compared to smaller competitors**. The beverage manufacturing sector represents an exception, where capital intensity has remained relatively balanced across firms of all sizes.

In most other sectors, changes in average capital intensity largely reflect the investment activity of market-leading firms. The greatest disparities are observed in retail, where leading firms exhibit more than five times the capital intensity of small competitors, and 43% higher than medium-sized enterprises. Similarly significant differences persist in the food manufacturing sector. Furthermore, in both sectors, gaps in labour capital intensity have widened over the last decade.

⁹² Autor, D. et al. (2020). „The Fall of the Labor Share and the Rise of Superstar Firms“

⁹³ Ganapati, S. et al. (2021). „Growing Oligopolies, Prices, Output, and Productivity. American Economic Association“.

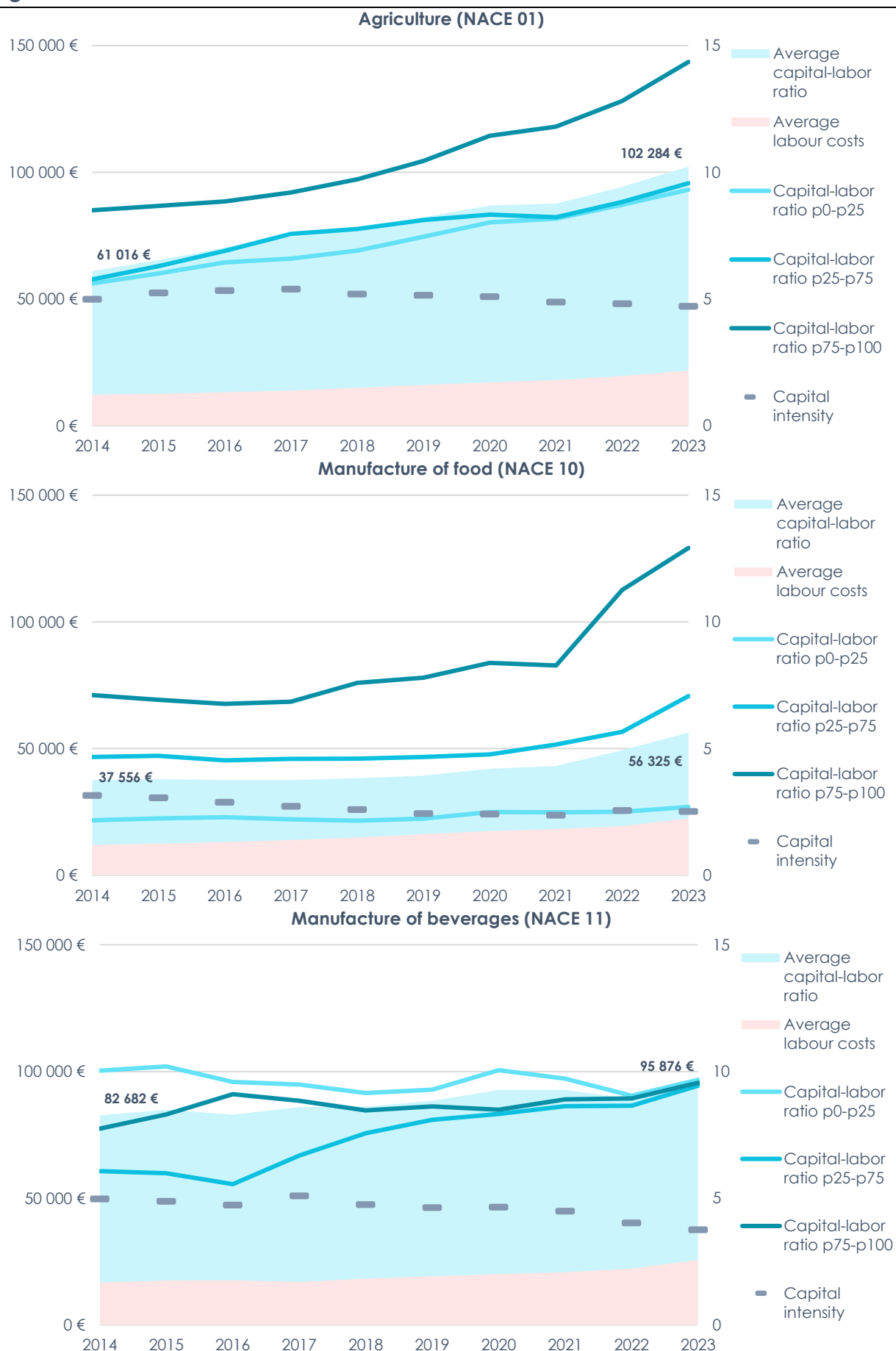
A critical challenge remains the stagnation of capital intensity in the smallest enterprises, particularly evident in manufacturing and retail. In these sectors, the nominal growth of capital intensity is marginal, negatively affecting value-added creation, firm productivity, and competitiveness. **Significant differences in labour capital intensity may reinforce the position of market leaders,** increasing sectoral concentration and weakening the competitiveness of smaller players.

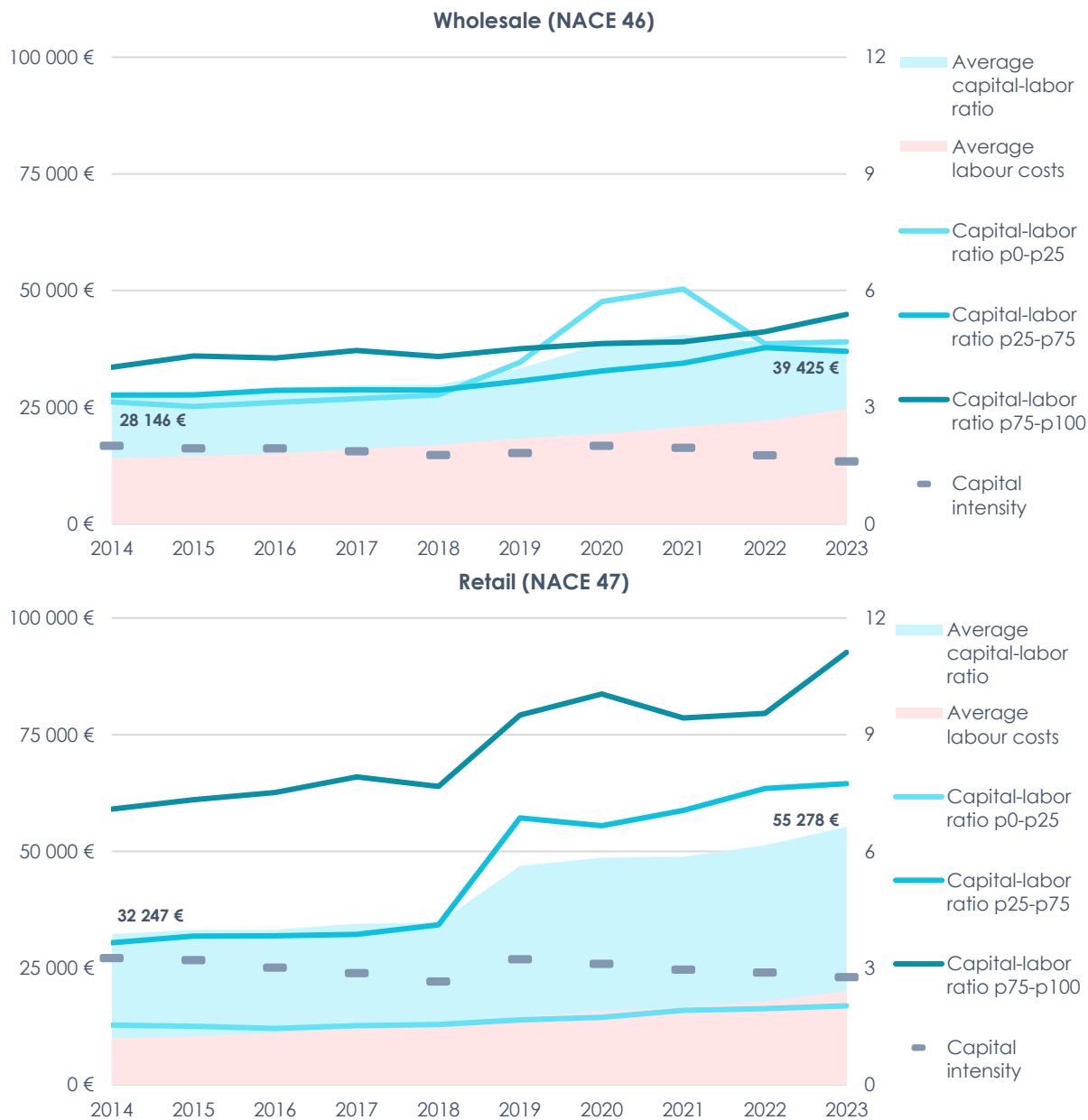
From a macroeconomic perspective, **it is essential to monitor the ratio of fixed to labour costs, which can be interpreted as the capital intensity of production.** Fixed costs reflect fixed capital, while labour costs capture the size of human capital within the firm. Empirical evidence indicates that **firms often substitute labour with capital to optimise costs.** When the elasticity of substitution between capital and labour exceeds one, a decline in the relative price of capital encourages technology investment, reducing the share of labour in overall production⁹⁴. However, **firms require adequate resources to implement such a shift.** These resources can be generated through productivity gains or by reducing overhead costs. **Failing sufficient investment, the share of fixed capital relative to rising wages declines, leading to reduced capital intensity.**

In Slovakia, this trend has been observed across all food industry sectors, with no sector achieving a significant increase in capital intensity over the past decade. This indicates an inability to generate sufficient resources for modernisation and process innovation. **As a result, long-term competitiveness is undermined, since the value of fixed capital does not increase in line with rising wages.** This is a critical concern, as investment in fixed assets is essential to sustain long-term productivity growth, which is a prerequisite for sustainable wage growth.

⁹⁴ Autor, D. et al. (2017). „Concentrating on the Fall of the Labor Share“.

Figure 41 - Capital intensity is falling, investment expenditure lagging behind wage growth





Note: Capital-Labor ratio expresses the value of physical capital per worker, and its breakdown is based on the percentile distribution of firms according to their market share. The capital intensity indicator reflects the ratio of physical to human capital, which is represented by the total labour costs of firms in a given sector. Physical capital is denoted as the sum of tangible and intangible assets of firms in a given year and sector

Source: Author's own calculations based on data from the Register of Financial Statements

Conclusion

Structural weaknesses in Slovakia's agri-food sectors are frequently misinterpreted as being primarily the result of insufficient competition. Such a perspective, however, oversimplifies the complexity of challenges faced by the sector. **While competition plays an important role, it is not the decisive factor explaining the sharp increase in food prices observed in recent years.** Its impact must be assessed in context and in conjunction with other economic drivers. **The key determinants of food price dynamics in the post-pandemic period have primarily been cost and production shocks, originating from both domestic and global sources.** From an international perspective, the overall price level of food products in Slovakia is not excessive. Following revisions of statistical data expressed in purchasing power standards (PPS), Slovakia continues to rank among the Member States with the lowest food prices in the EU.

Up to the first half of 2022, the most significant drivers of food price growth were the rising prices of food commodities and energy on global markets, which remain highly sensitive to geopolitical tensions, climate change and disruptions in global supply chains. These shocks had a direct impact on Slovak producers, who are heavily dependent on imported raw materials. In addition, logistic costs increased due to higher fuel prices and disruptions in international transport routes. Rising labour costs, driven particularly by increases in the statutory minimum wage and inflation-induced wage pressures, further contributed to higher production costs, which were subsequently reflected in consumer prices.

From the second half of 2022 and throughout 2023, profitability within the food value chain gained greater importance. Analyses conducted by the Ministry of Finance of the Slovak Republic and the International Monetary Fund (IMF), as well as **trends in gross value added and profitability across different segments of the food chain, suggest that price increases during this period were also associated with rising margins⁹⁵.** This has fuelled debate as to whether such developments reflect a weakening of competition or a natural adjustment of firms to altered market conditions. **Whereas the initial inflationary phase was dominated by external cost shocks, later developments indicated that part of the price growth was also linked to profitability, particularly in primary production and food processing.** The key question remains whether this represents a temporary phenomenon or a more permanent shift in market dynamics.

Sectoral analysis has highlighted several structural challenges with long-term implications for the performance of the agri-food sector. **While household consumption is increasing, it is paradoxically accompanied by limited growth in real wages, resulting in a higher share of household budgets being spent on food.** This constrains purchasing power and reduces demand for higher-quality, higher-value products, thereby limiting the development of market segments with greater value added.

⁹⁵ International Monetary Fund(2024). „Slovak Republic: Selected Issues“.

In recent years, **the price growth of domestic production has outpaced that of imported food products, leading to a decline in the competitiveness of Slovak products both on the domestic and international markets.** This reflects higher increases in production input costs—including energy, materials, and labour, combined with relatively high intermediate consumption requirements. Overall, the higher price level is likely a manifestation of deepening structural inefficiencies, such as weak investment levels, relatively high labour costs exacerbated by the tax and social contribution burden, and the suboptimal use of government subsidies.

The declining efficiency in the use of production resources highlights weak productivity, which is the outcome of several interrelated factors, such as low capital intensity of labour, insufficient levels of investment and innovation, and shortages of skilled labour. These challenges undermine not only cost efficiency but also the overall competitiveness of Slovakia's agri-food sector. **Domestic producers face growing difficulties in maintaining competitiveness vis-à-vis foreign producers, who often benefit from higher efficiency, lower production costs, and better access to technological innovations.**

The lack of production in higher value-added segments further constrains profitability and contributes to the sector's low economic resilience. Limited production capacity increases dependence on imports, making the country more vulnerable to external shocks such as global crises or supply chain disruptions.

The relatively small size of the domestic market additionally constrains opportunities for scaling up production and enhancing export capacity. Slovak producers often lack sufficient production volumes to achieve economies of scale, resulting in higher costs compared to larger foreign competitors. At the same time, insufficient investment in modernisation and innovation slows technological progress and reduces the sector's capacity to adapt to changing market conditions.

Low labour productivity remains another major challenge impeding production efficiency. Slovakia lags behind advanced economies in the adoption of innovative technologies, automation, and the digitalisation of production processes. This results in higher unit costs, which are passed on to final product prices.

Finally, the inefficient allocation of agricultural subsidies does not deliver the expected improvements in productivity and competitiveness. **Subsidies are often distributed without sufficient regard to their impact on innovation potential and production sustainability, resulting in a misallocation of public resources.**

Taken together, these factors create a complex set of challenges requiring a strategic policy response. Addressing them will necessitate a comprehensive approach encompassing investment promotion, support for technological innovation, more efficient resource utilisation, and optimisation of the subsidy framework. **Without fundamental reforms, Slovakia's agri-food sector will remain vulnerable to global economic fluctuations, further exacerbating existing challenges related to competitiveness and food security.**

References

- [1] AGHION, P. et al. (2005). „*Competition and innovation: An inverted-U relationship*“. The Quarterly Journal of Economics, 120/2, 701- 728.
- [2] AGRICULTURAL MARKETS TASK FORCE (2016). „*Improving market outcomes: Enhancing the position of farmers in the supply chain*“.
- [3] ACHARYA, V. - CROSIGNANI, M - EISERT, T. - EUFINGER, C. (2023). „*How do supply shocks to inflation generalize? Evidence from the pandemic era in Europe.*“ National Bureau of Economic Research, 31790.
- [4] AUTOR, D. et al. (2017). „*Concentrating on the Fall of the Labor Share*“. American Economic Review, 107, 185-180.
- [5] AUTOR, D. et al. (2020). „*The Fall of the Labor Share and the Rise of Superstar Firms*“. Oxford University Press: The Quarterly Journal of Economics, 135, 645–709.
- [6] BAJGAR, M. et al. (2023). „*Industry Industry concentration in Europe and North America*“. Industrial and Corporate Change.
- [7] BARKAI, S. (2020). „*Declining labor and capital shares*“. Journal of Finance, 75/5, 2421-2463.
- [8] BONNANO et al. (2018). „*Market power and bargaining in agrifood markets: A review of emerging topics and tools*“.
- [9] CALLIGARIS et al. (2024). „*Exploring the evolution and state of competition in the EU*“.
- [10] CASALIS, A. (2023). „*When food bites back – What quarterly firm-level data reveal about food inflation*“. Policy Brief No.2, Národná banka Slovenska. Retrived from: <https://nbs.sk/dokument/24aa1832-d652-4812-a1c4-63d4caa7802d/stiahnut?force=false>
- [11] CAVALLERI, M. C. - ELIET, A. - MCADAM, P. - PETROULAKIS, F. - SOARES, A. C. - VANSTEENKISTE, I. (2019). „*Concentration, Market Power and Dynamism in the Euro Area*“. ECB Working Paper. Retrived from: <https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2253~cf7b9d7539.en.pdf?df723a5344bd08276051cc75f3c79c4fd>
- [12] CONLON, C. - MILLER, N. - OTGON, T. - YAO, Y. (2023). „*Rising markups, rising prices?*“ AEA Papers and Proceedings, 113, 279-283.
- [13] COVARRUBIAS, M. - GUTIÉRREZ, G. – PHILIPPON, T. (2019). „*From Good to Bad Concentration? US Industries over the Past 30 Years*“. NBER Macroeconomics Annual. Retrived from: <https://www.journals.uchicago.edu/doi/epdf/10.1086/707169>
- [14] CRAMON-TAUBADEL, S. – GOODWIN, K. (2021). „*Price Transmission in Agricultural Markets*“. Annual Review of Resource Economics.
- [15] DAVIES, S. - MARIUZZO, F. (2022). *The changing face of antitrust in the world of Big Tech: Collusion versus Monopolisation*. Cambridge Journal of Economics, 46/6, 1455-1479.
- [16] DE LOECKER, J. - EECKHOUT, J. - MONGEY, S. (2021). „*Quantifying market power and business dynamism in the macroeconomy*“. National Bureau of Economic Research, 28761.

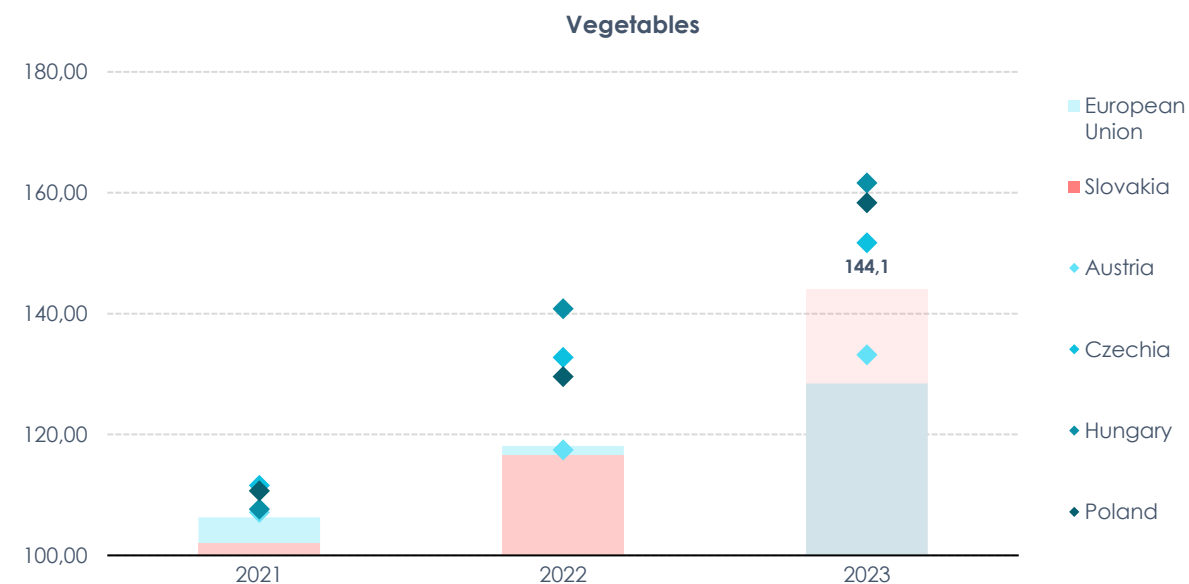
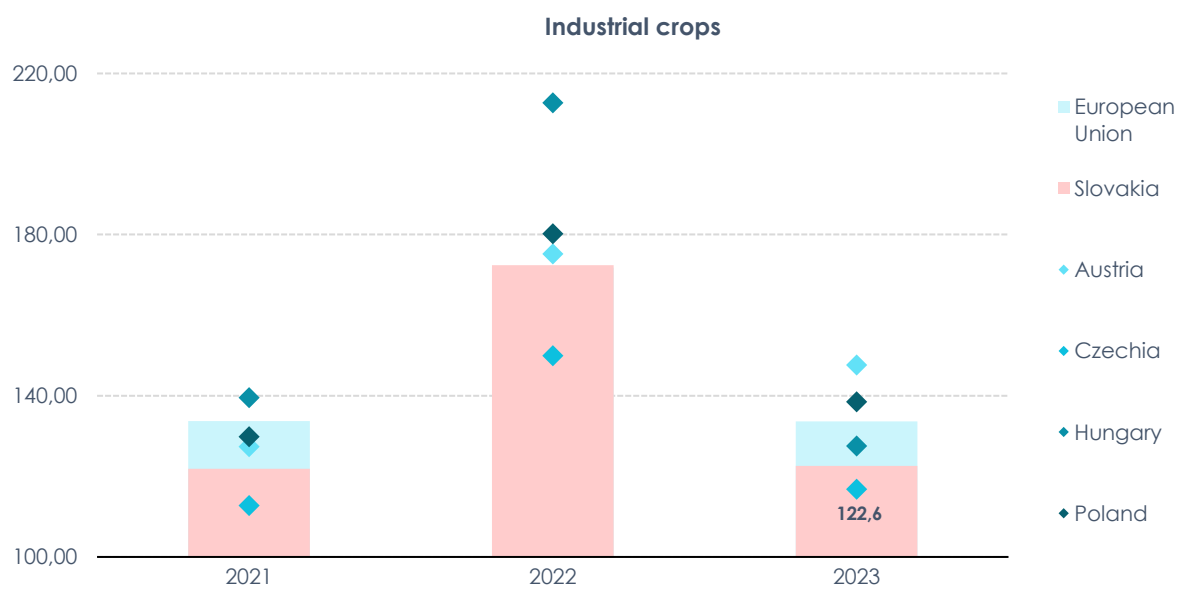
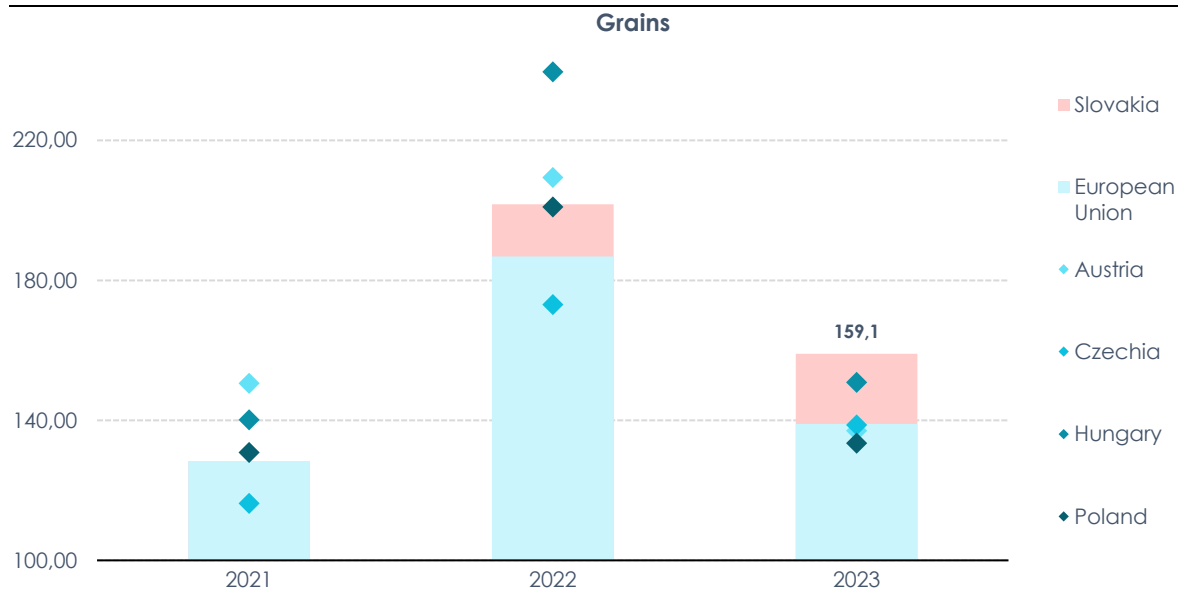
- [17] DE LOECKER, J. - EECKHOUT, J. - UNGER, G. (2020). „*The rise of market power and the macroeconomic implications*“. The Quarterly Journal of Economics, 135/2, 561-644.
- [18] DE LOECKER, J. - WARZYNSKI, F. (2012). „*Markups and firm-level export status*“. The American Economic Review, 102/6, 2437-2471.
- [19] DE RIDDER, M. (2024). „*Market power and innovation in the intangible economy*“. American Economic Review, 114/1, 199-251.
- [20] DECONINCK, K. (2021), „*Concentration and market power in the food chain*“. OECD Food, Agriculture and Fisheries Papers, No. 151, OECD Publishing, Paris. Retrived from: <https://doi.org/10.1787/3151e4ca-en>
- [21] DECONINCK, K. (2021). „*Concentration and market power in the food chain*“. Retrived from: <https://www.oecd-ilibrary.org/deliver/3151e4ca-en.pdf?itemId=%2Fcontent%2Fpaper%2F3151e4ca-en&mimeType=pdf>
- [22] EIB (2023). „*Survey on financial needs and access to finance of EU agricultural enterprises*“. Retrived from: <https://www.fi-compass.eu/publication/market-analysis/survey-financial-needs-and-access-finance-eu-agricultural-enterprises>
- [23] EUROPEAN COMMISSION (2009). „*Analysis of price transmission along the food supply chain in the EU*“. Commission Staff Working Document. Retrived from: https://ec.europa.eu/economy_finance/publications/pages/publication16067_en.pdf
- [24] EUROPEAN COMMISSION (2014). „*Innovation Union competitiveness report 2013*“. Available at: <https://data.europa.eu/doi/10.2777/44320>
- [25] EUROPEAN COMMISSION (2014). „*The economic impact of modern retail on choice and innovation in the EU food sector*“. Retrived from: <https://data.europa.eu/doi/10.2763/77405>
- [26] EUROPEAN COMMISSION (2016). „*The competitive position of the European food and drink industry*“. Retrived from: <https://op.europa.eu/en/publication-detail/-/publication/65cec388-d156-11e5-a4b5-01aa75ed71a1>
- [27] EUROPEAN COMMISSION (2024). „*Protecting competition in a changing world - Evidence on the evolution of competition in the EU during the past 25 years*“. Directorate-General for Competition, Luxembourg: Publications Office of the European Union.
- [28] EUROPEAN UNION (2022). „*Guide on Multilateral Methods in the Harmonised Index of Consumer Prices*“. Retrived from: <https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/ks-gq-21-020>
- [29] EUROPEAN UNION (2024). „*Harmonised Index of Consumer Prices (HICP) - Methodological Manual 2024 edition*“. Retrived from: <https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/w/ks-gq-24-003>
- [30] EUROSTAT (2008). „*Statistical classification of economic activities in the European Community*“. Methodologies and Working papers. Retrived from: <https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/ks-ra-07-015>

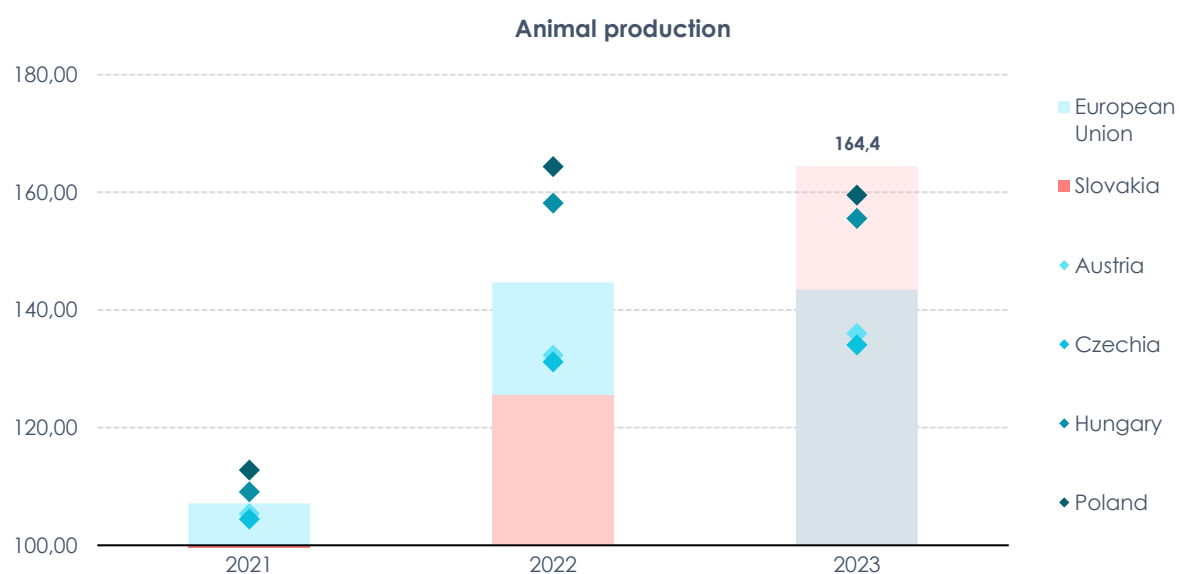
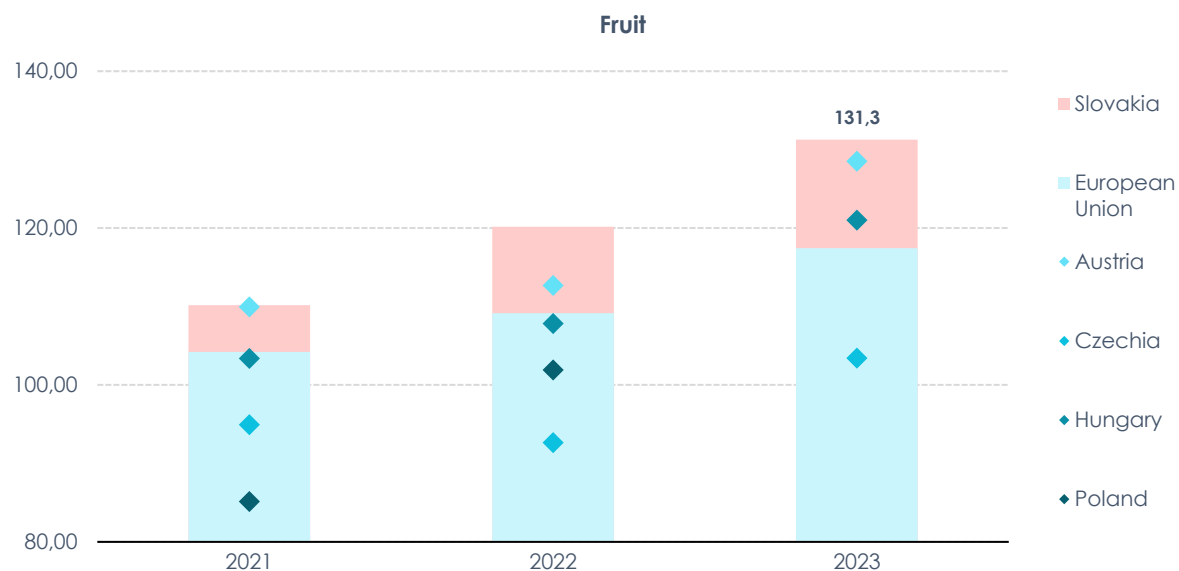
- [31] EUROSTAT (2023). „Key figures on the European food chain - 2023 edition“. Retrived from: <https://ec.europa.eu/eurostat/en/web/products-key-figures/w/ks-fk-23-001>
- [32] GANAPATI, S. et al. (2021). „Growing Oligopolies, Prices, Output, and Productivity. American Economic Association“. American Economic Journal: Microeconomics, 13, 309-327.
- [33] GUTIÉRREZ, G. - PHILIPPON, T. (2017). „Declining Competition and Investment In The U.S.“. NBER Working Paper 23583. Retrived from: https://www.nber.org/system/files/working_papers/w23583/w23583.pdf
- [34] HEADEY, D. - RUEL, M. (2023). „Food inflation and child undernutrition in low- and middle-income countries“. Retrived from: <https://doi.org/10.1038/s41467-023-41543-9>
- [35] INTERNATIONAL MONETARY FUND(2024). „Slovak Republic: Selected Issues“. IMF Staff Country Reports 2024.
- [36] KOUVAVAS, O. - OSBAT, CH. - REINELT, T. - VANSTEENKISTE, I. (2021). „Markups and inflation cyclicalilty in the euro area“. Working Paper Series 2617, European Central Bank.
- [37] LEAR et al. (2024). „Exploring aspects of the state of competition in the EU: Final report“.
- [38] MC CORRISTON, S. – MORGAN, C. – RAYNER, A. (1998). „Processing technology, market power and price transmission“.
- [39] MINISTRY OF FINANCE OF THE SLOVAK REPUBLIC (2024). „Analýza cenového vývoja základných druhov potravín 9/2024“. Retrived from: <https://rokovania.gov.sk/download.dat?id=B235C26AD1644AC6A4F5CD60E4546B3F-970DF23557E7A106758B6FE3AECC3F9E>
- [40] MINISTRY OF FINANCE OF THE SLOVAK REPUBLIC (2024). „Koncepcia cenovej politiky na roky 2024 – 2027“. Dostapné na: https://www.mfsr.sk/files/archiv/45/03_vlastny-material.pdf
- [41] MINISTRY OF FINANCE OF THE SLOVAK REPUBLIC (2025). „Slovenská ekonomika vstupuje do globálnej ekonomickej neistoty“, Makroekonomická prognóza na roky 2024 - 2029. Retrived from: <https://ifp.sk/71-zasadnutie-makrovyboru/>
- [42] MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT OF THE SLOVAK REPUBLIC (2023). „Analýza a odporúčania k riešeniu potravinovej inflácie na Slovensku“.
- [43] MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT OF THE SLOVAK REPUBLIC (2023). „Report on Agriculture and Food Sector in the Slovak Republic for 2022“. Retrived from: <https://www.mpsr.sk/en/download.php?fID=267>
- [44] MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT OF THE SLOVAK REPUBLIC (2023). „Analýza vplyvov stropovania priamych platieb Spoločnej poľnohospodárskej politiky a inštitucionálnej pripravenosti stropovania na konečného užívateľa výhod“. Retrived from: <https://rokovania.gov.sk/RVL/Material/28119/1>
- [45] MORVAY, K. (2020). „Slovenská ekonomika na ceste od nedostatku práce k nedostatku jej produktivity“. Ekonomická univerzita v Bratislave, Vydavateľstvo Ekonóm, ISBN 978-80- 225-4765-9.

- [46] NATIONAL BANK OF THE SLOVAK REPUBLIC (2025). „Za zrýchlením inflácie boli najmä dane a potraviny“, Rýchly komentár analytikov UMS publikovaný 17/02/2025. Retrived from: <https://nbs.sk/dokument/94f6f4f2-15d7-4e7b-9ab9-95998c2c3be5/stiahnut?force=false>
- [47] NES, K. - COLEN, L. - CIAIAN, P. (2021). „Market Power in Food Industry in Selected EU Member States“. Publications Office of the European Union.
- [48] OECD (2018). „Market Studies Guide for Competition Authorities“. Retrived from: https://www.oecd.org/en/publications/market-studies-guide-for-competition-authorities_7381b582-en.html
- [49] OECD (2023). „Economic Policy Reforms 2023: Going for Growth“. OECD Publishing.
- [50] OECD (2024). „Competition in the Food Supply Chain“. OECD Roundtables on Competition Policy Papers, No. 319. Retrived from: <https://doi.org/10.1787/20758677>
- [51] OECD (2024). „Monopolisation, moat building and entrenchment strategies“.
- [52] OECD Global Forum on Competition (2024). „Competition in the Food Supply Chain - Contributions from Austria, Croatia, European Union, Finland and Latvia“. Retrived from: <https://www.oecd.org/en/events/2024/12/global-forum-on-competition-2024.html>
- [53] SEXTON, R. - XIA, T. (2018). „Increasing concentration in the agricultural supply chain: Implications for market power and sector performance“. Annual Review of Resource Economics, 10, 229–251.
- [54] SEXTON, R. J. (2012). „Market power, misconceptions, and modern agricultural markets“. American Journal of Agricultural Economics, 95/2, 209–219.
- [55] SHELDON, I. M. (2017). „The competitiveness of agricultural product and input markets: A review and synthesis of recent research“. Journal of Agricultural and Applied Economics, 49, 1–44.
- [56] UNITED STATES DEPARTMENT OF JUSTICE AND FEDERAL TRADE COMMISSION. (2010). „Horizontal Merger Guidelines“.
- [57] VAN DAM et al. (2021). „A detailed mapping of the food industry in the European single market: similarities and differences in market structure across countries and sectors“. International Journal of Behavioral Nutrition and Physical Activity.
- [58] VLACHYNSKÝ, M. (2023). „Chlieb a politika“. Retrived from: https://iness.sk/sites/default/files/documents/pdf/IPN/chlieb_a_politika.pdf

Annexes

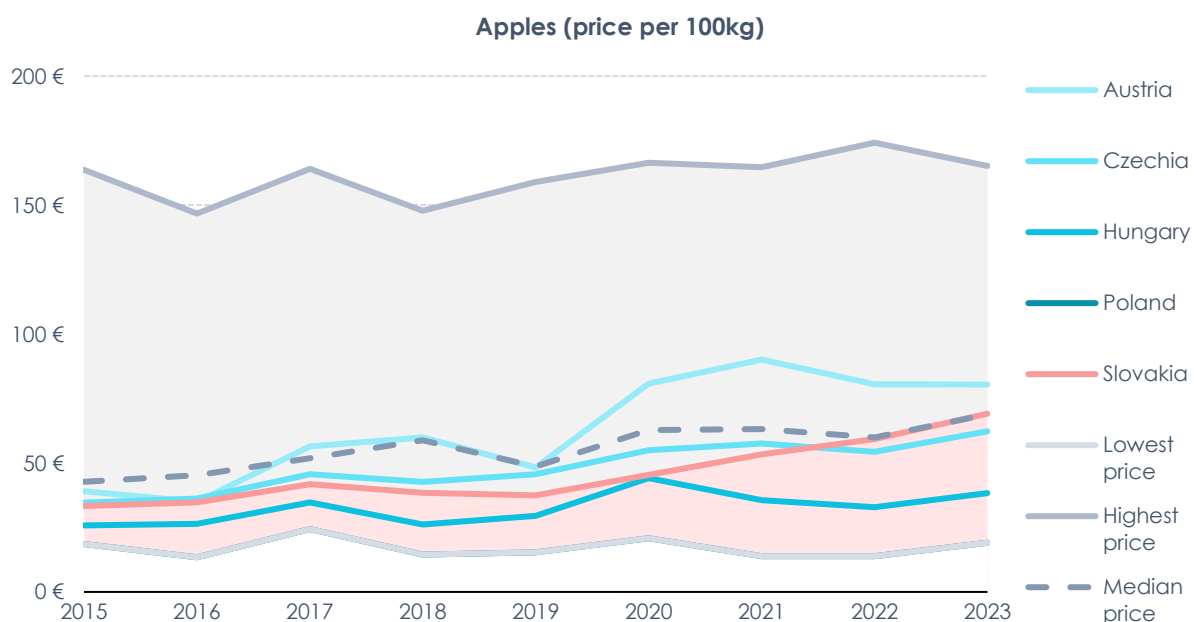
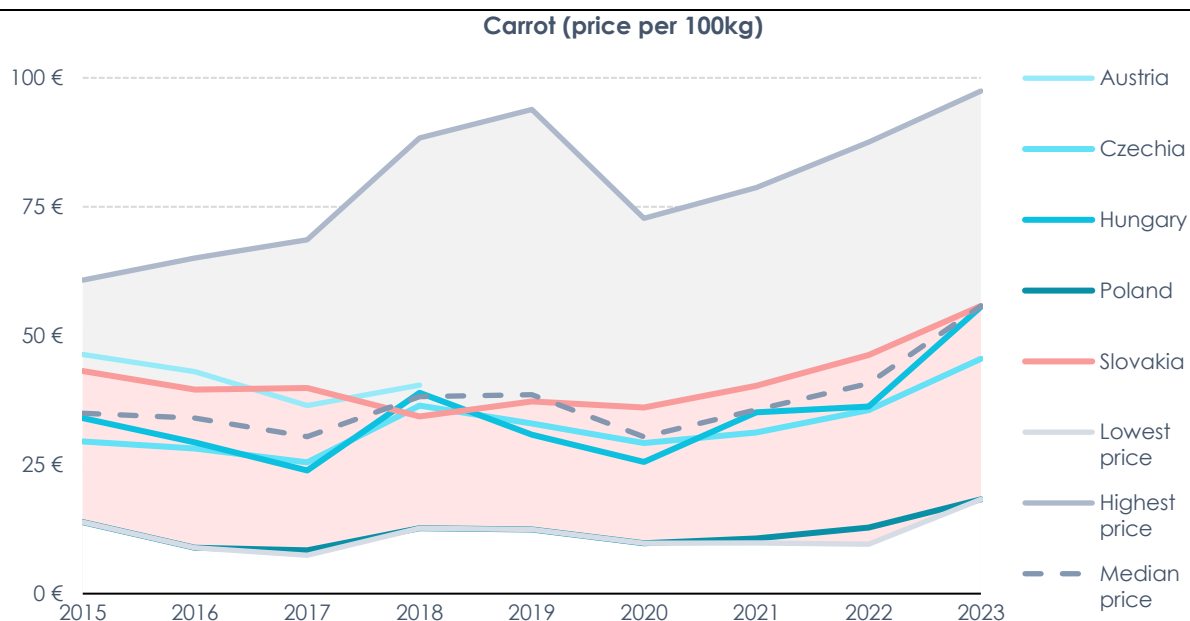
Annex 1 - Agricultural production price trends in Slovakia and selected countries



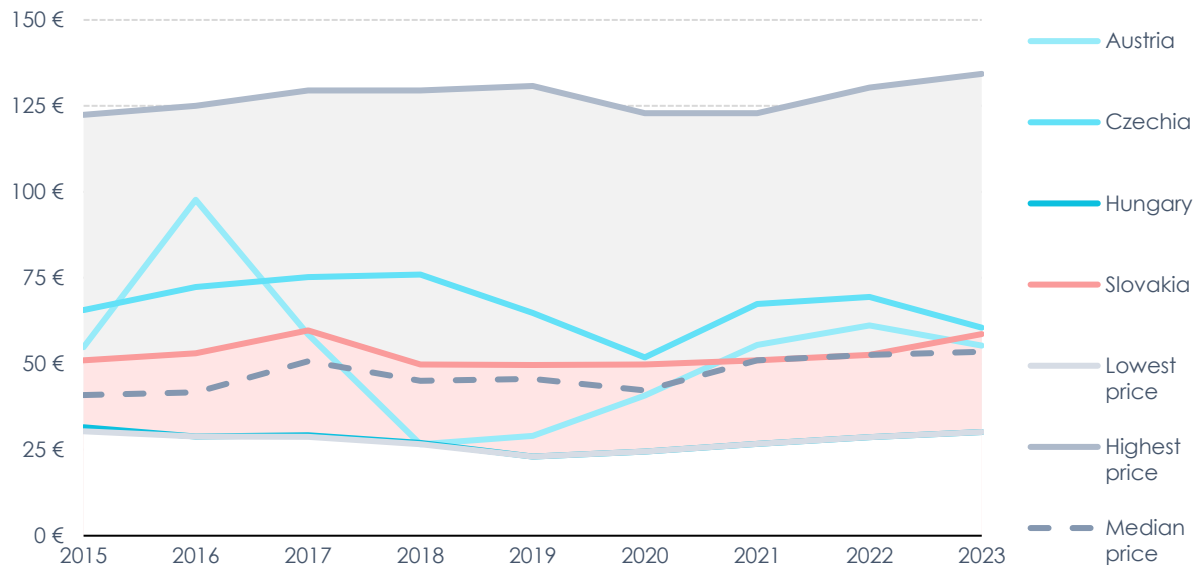


Note: The price level is represented by the price index at current prices with a base year of 2020
Source: Eurostat database (apri_pi15_outa, data updated on 19/01/2024)

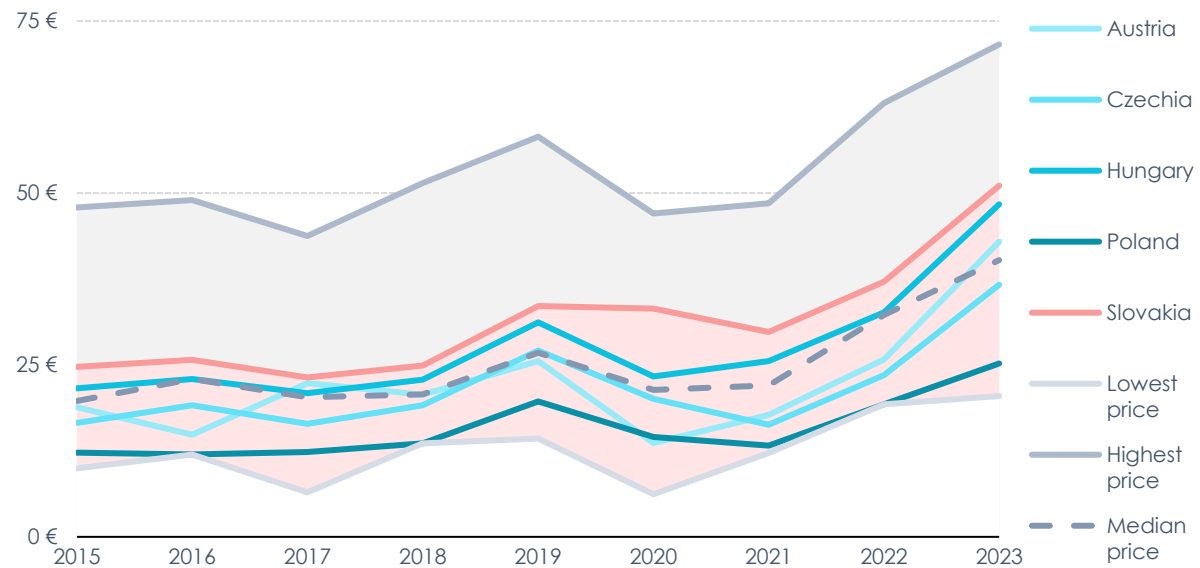
Annex 2 - Producer price trends of selected crop products in Slovakia and the EU countries



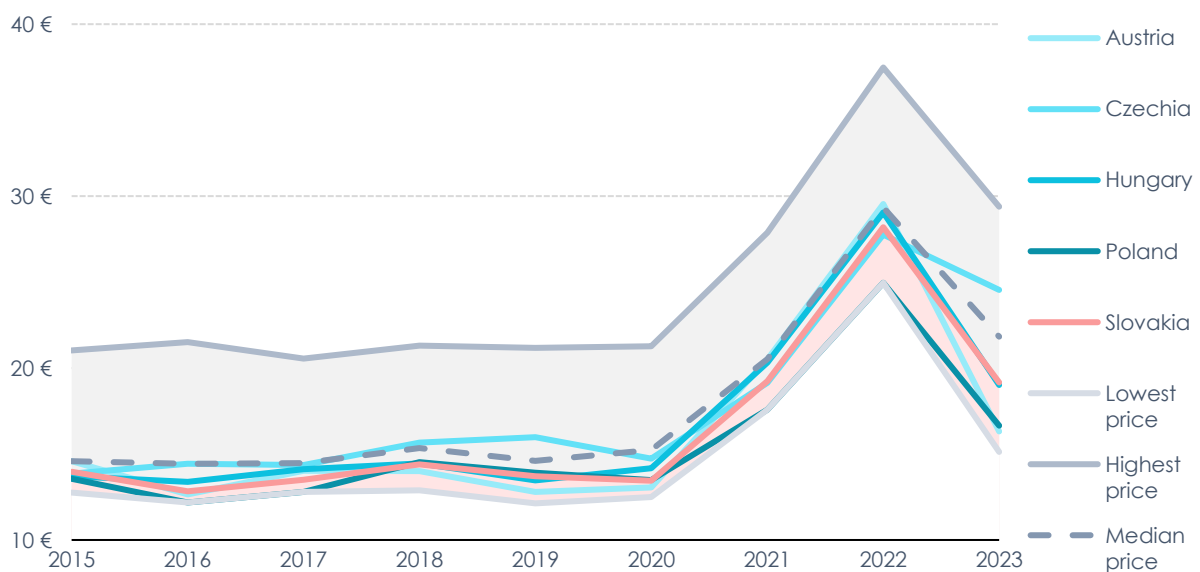
Grapes (price per 100kg)



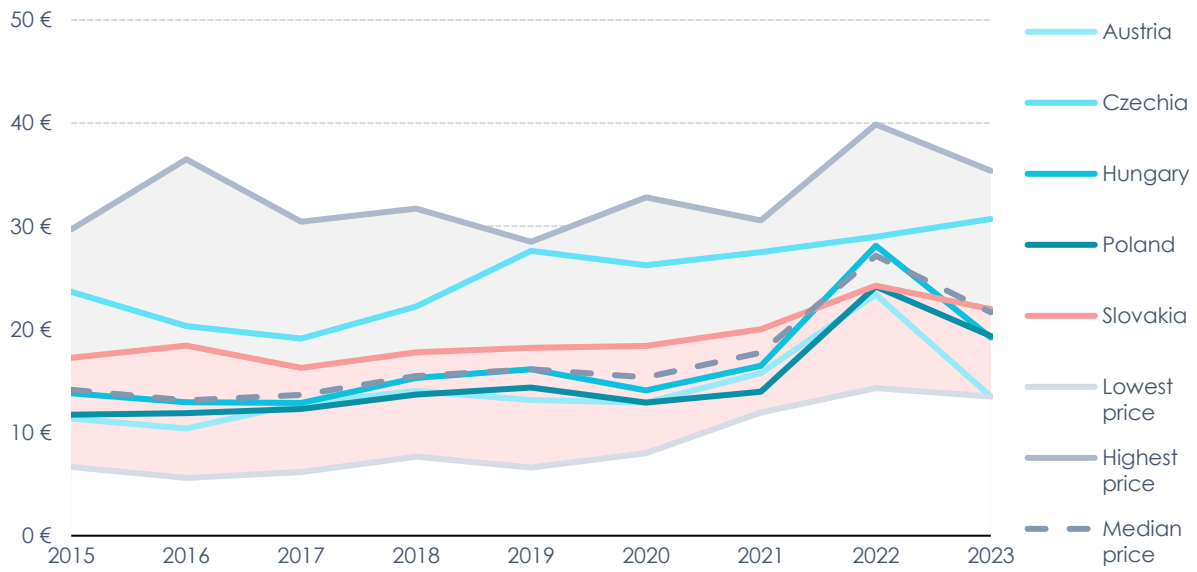
Potatoes (price per 100kg)



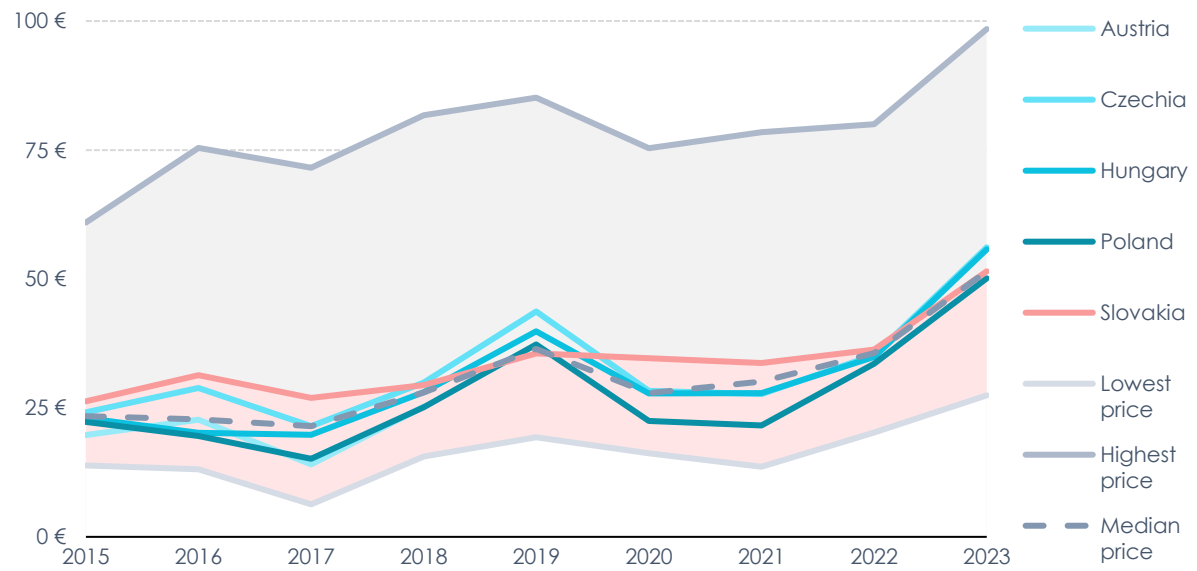
Maize (price per 100kg)



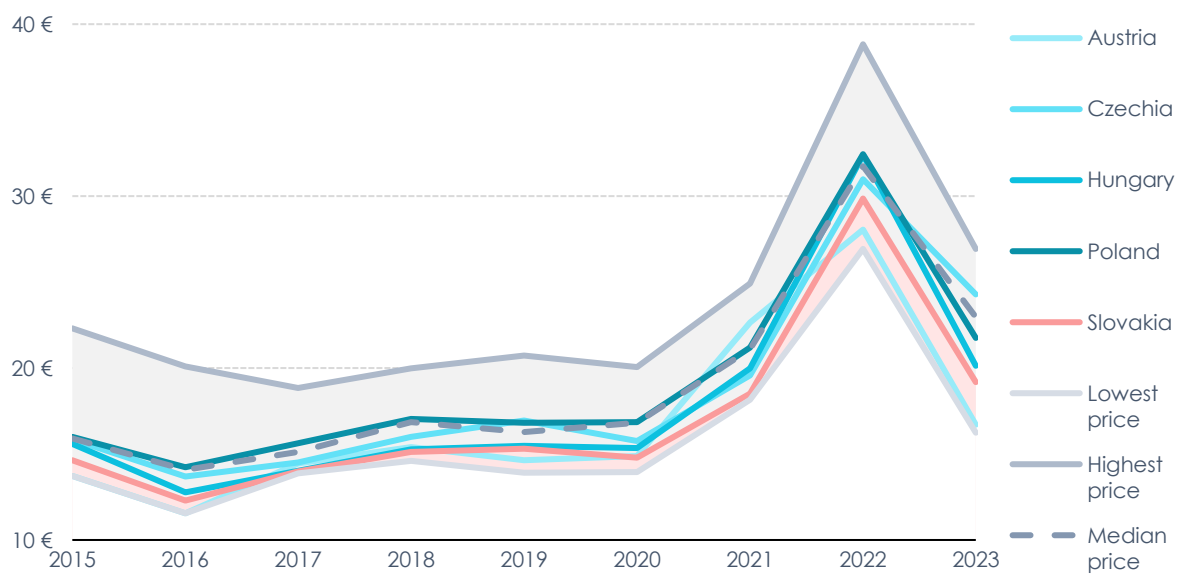
Oats (price per 100kg)

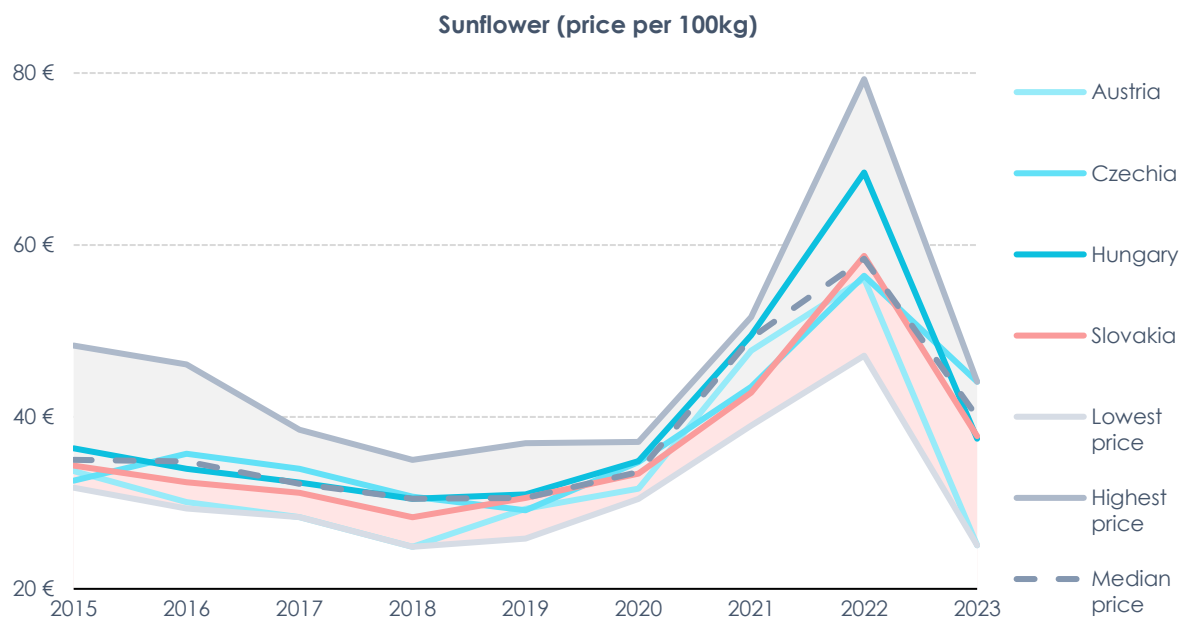
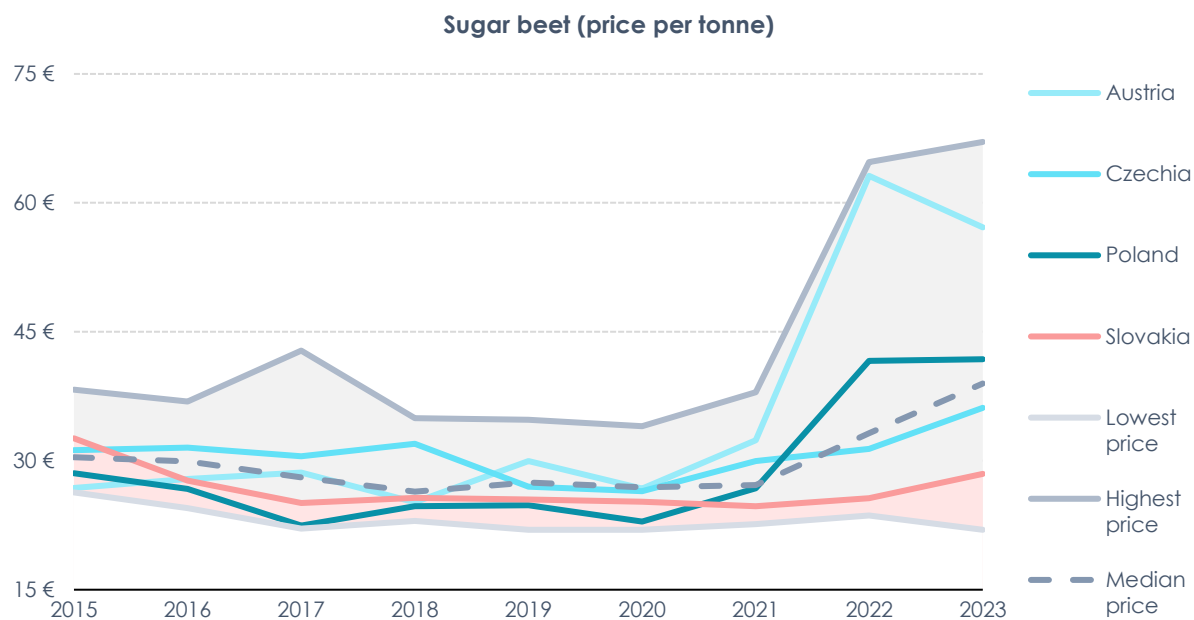


Onion (price per 100kg)



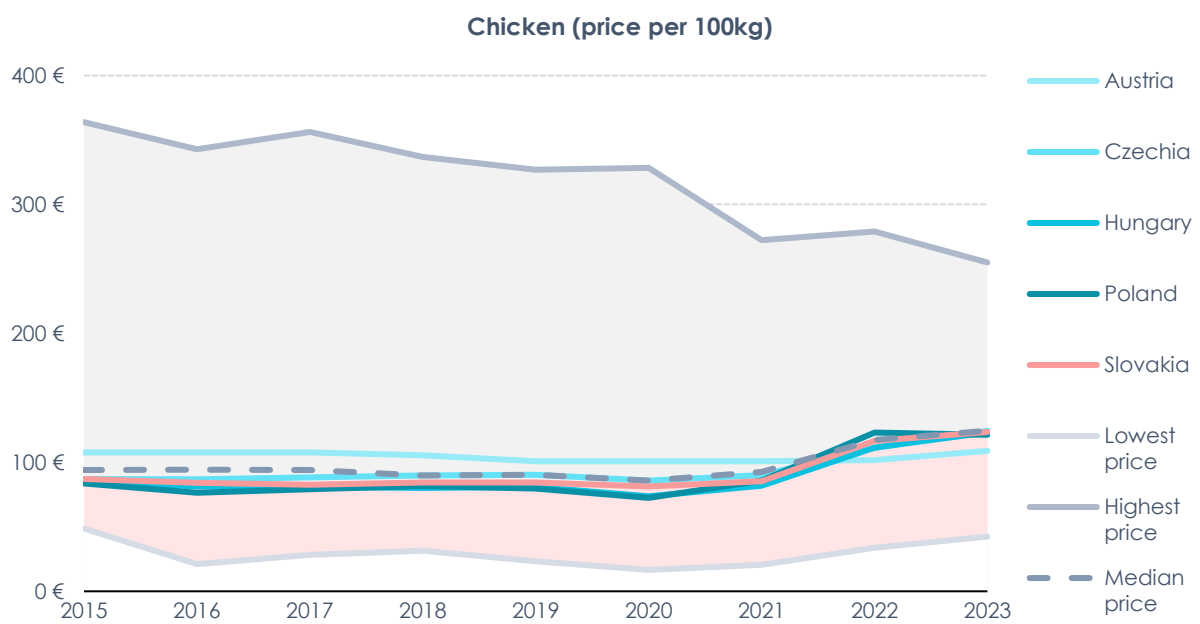
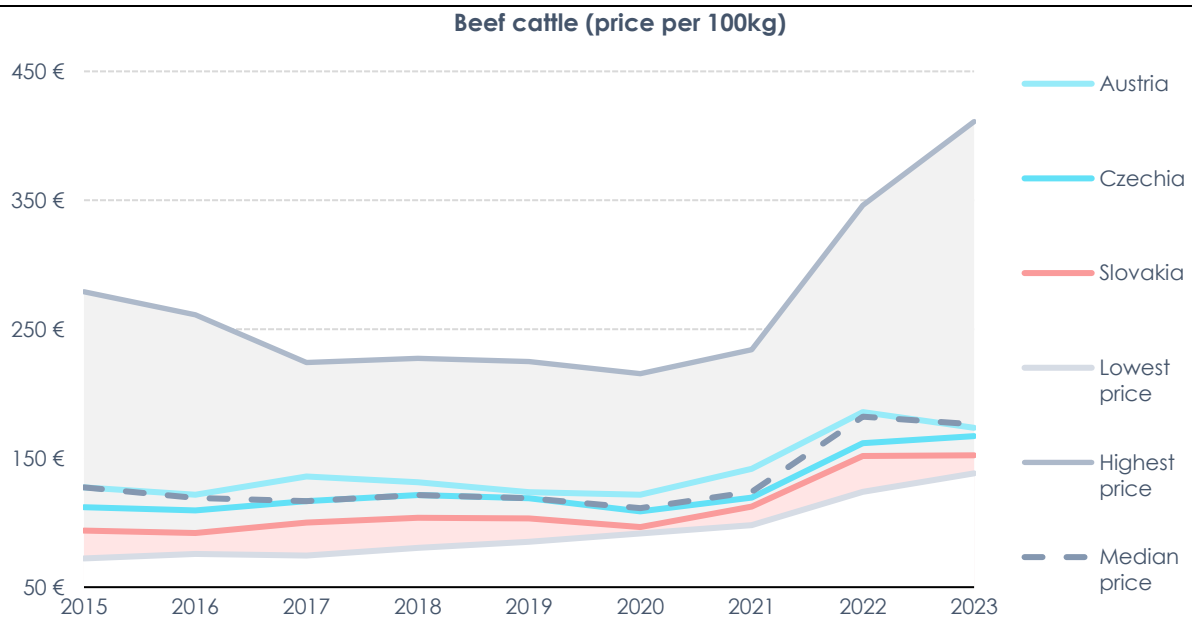
Wheat (price per 100kg)

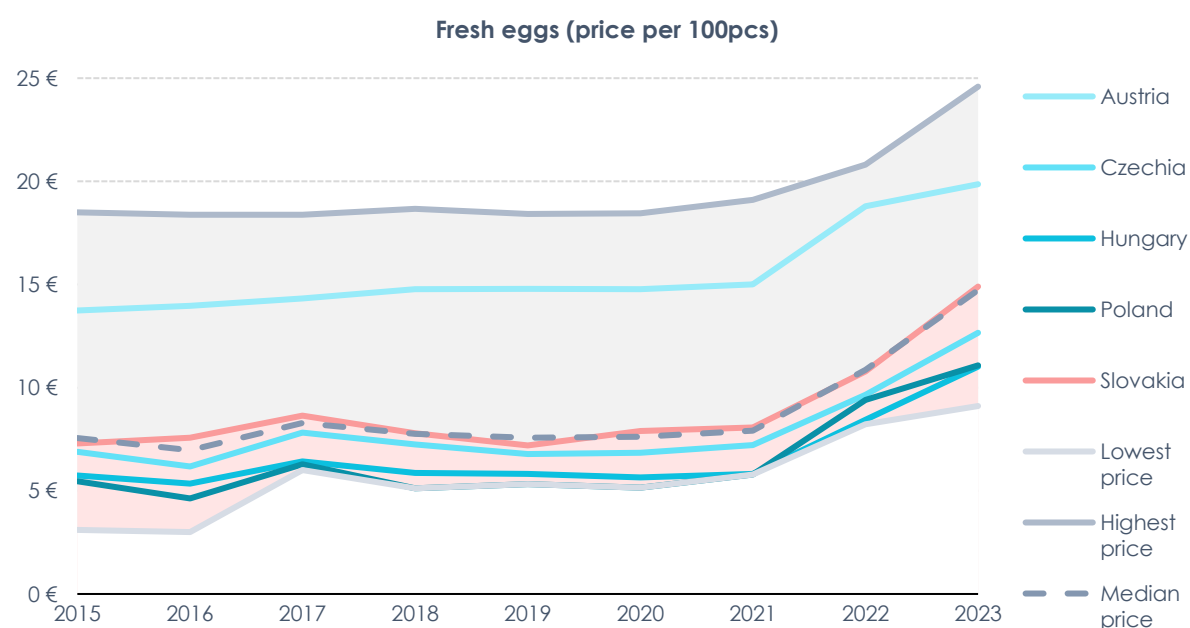
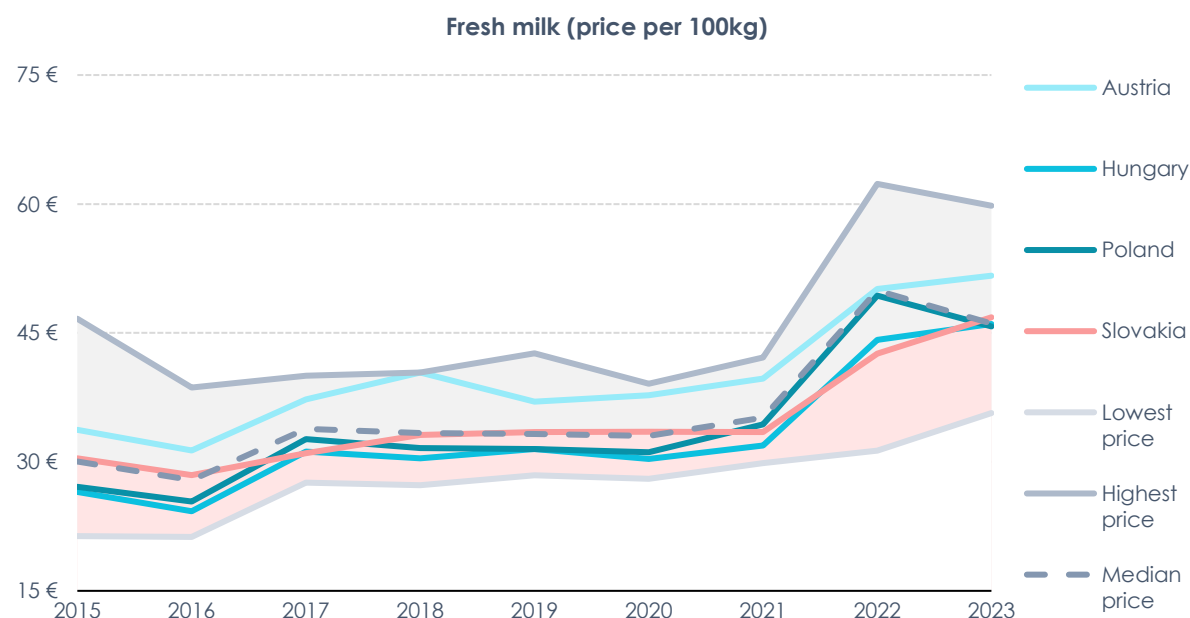
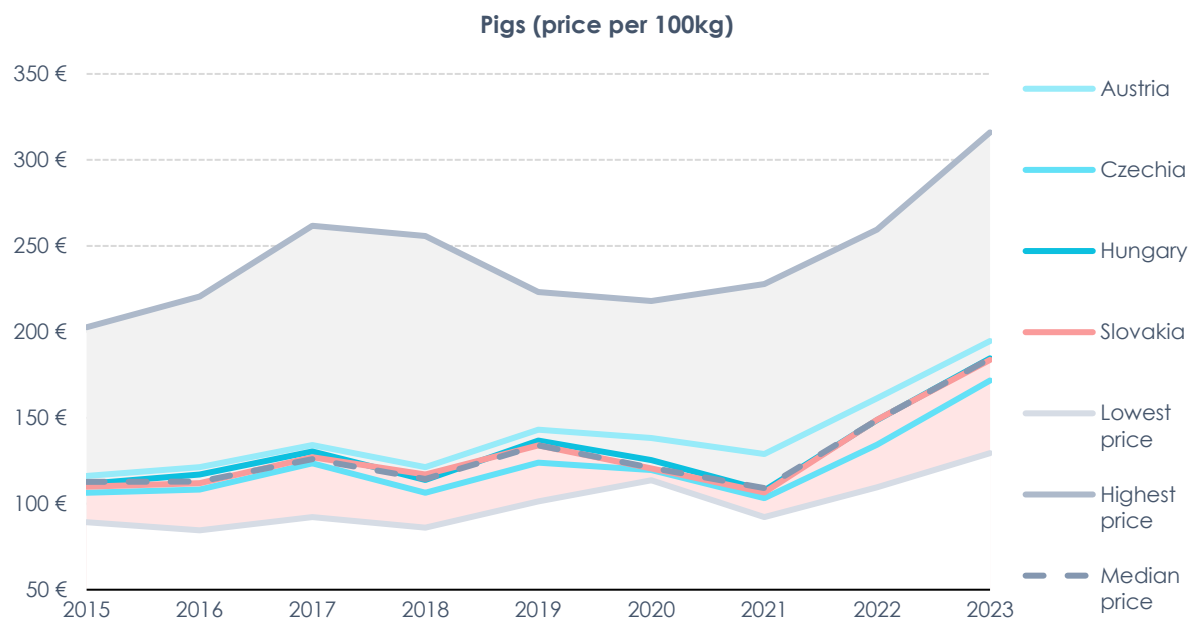




Source: Eurostat database (apri_ap_crpouta, data updated on 28/06/2024)

Annex 3 - Producer price trends of selected animal products in Slovakia and the EU countries

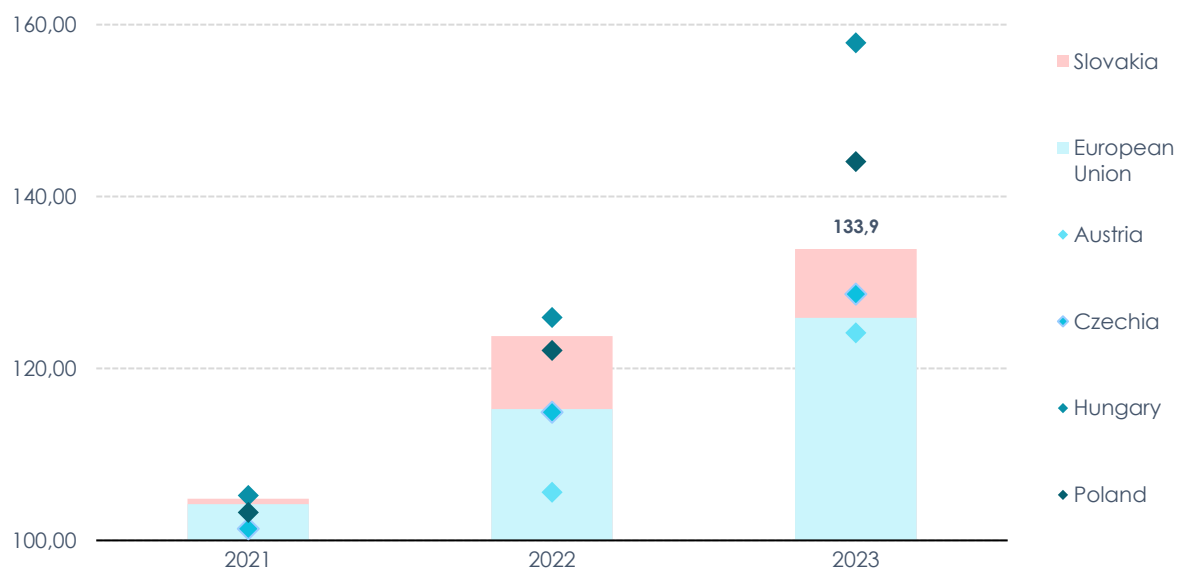




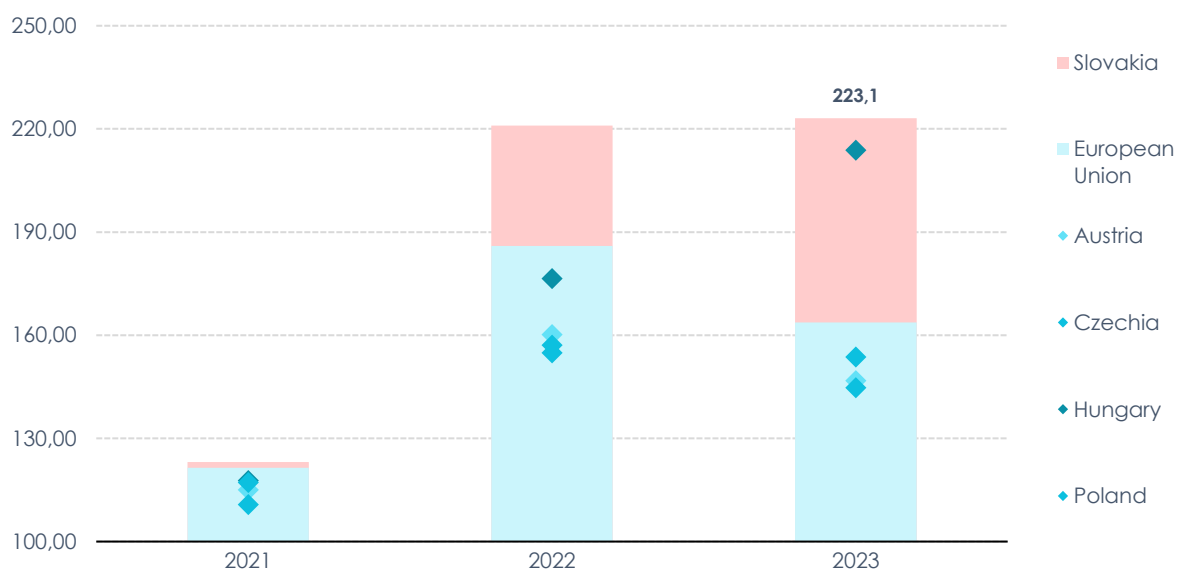
Source: Eurostat database (apri_ap_anouta, data updated on 28/06/2024)

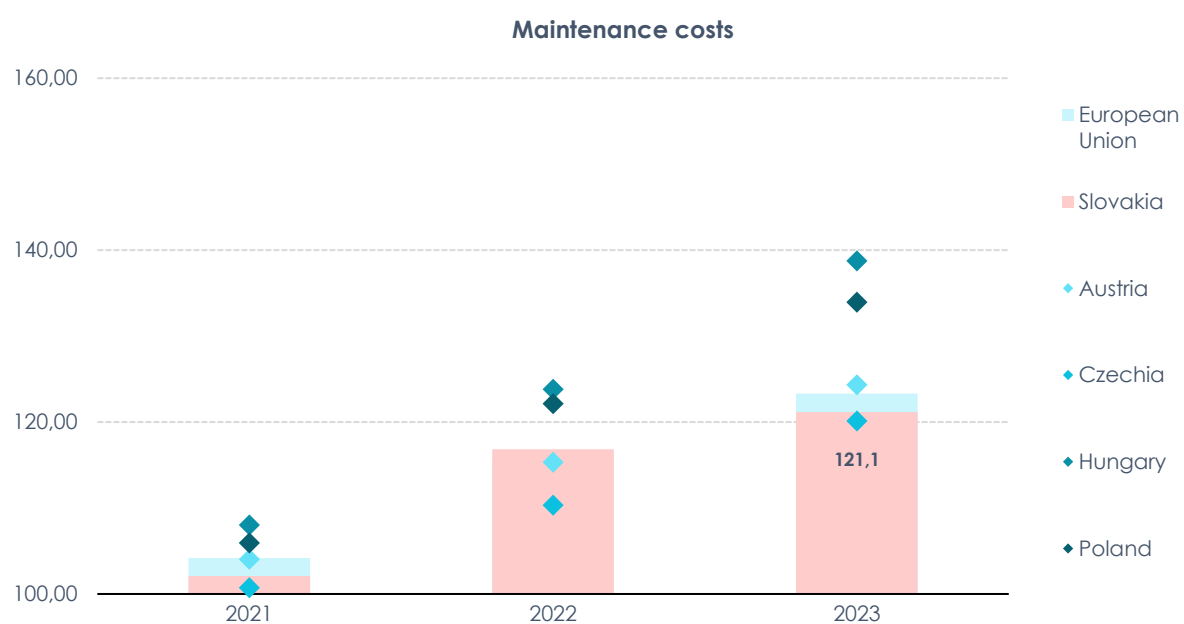
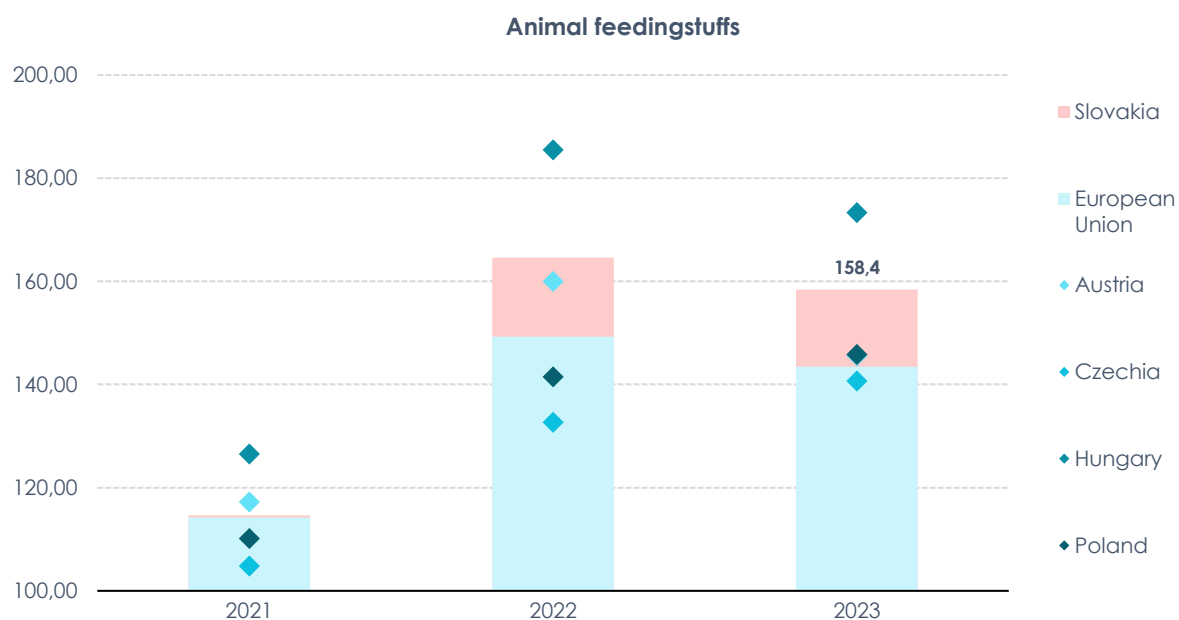
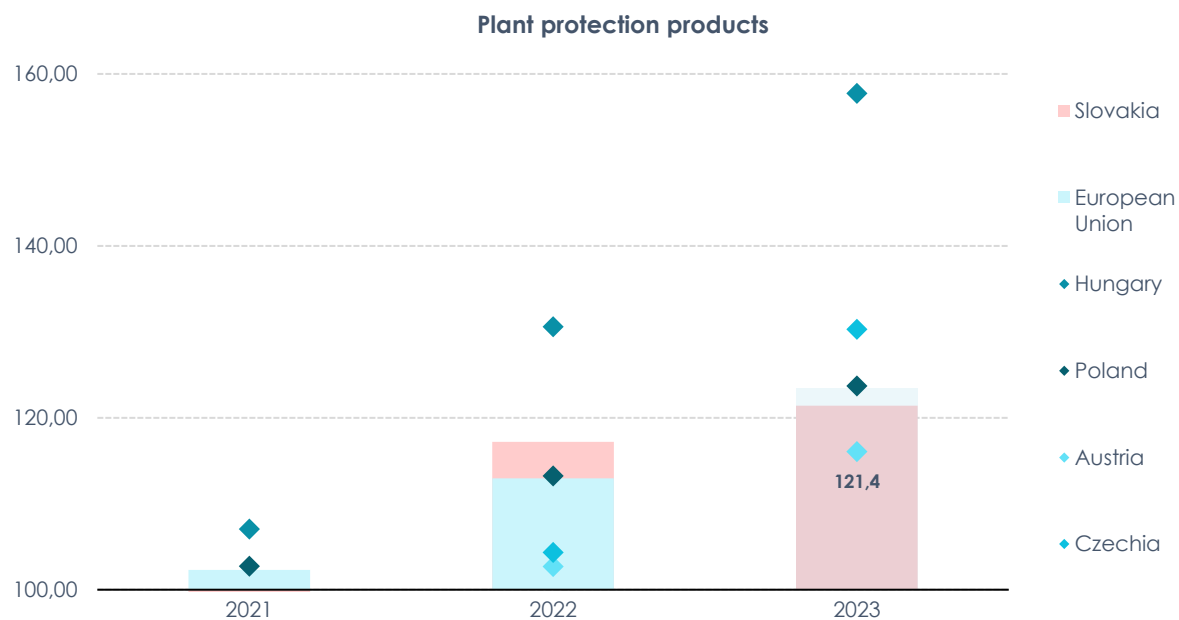
Annex 4 - Agricultural input price trends in Slovakia and selected countries

Seeds and seedlings



Energy





Note: The price level is represented by the price index at current prices with a base year of 2020

Source: Eurostat database (apri_pi15_ina, data updated on 19/01/2024)

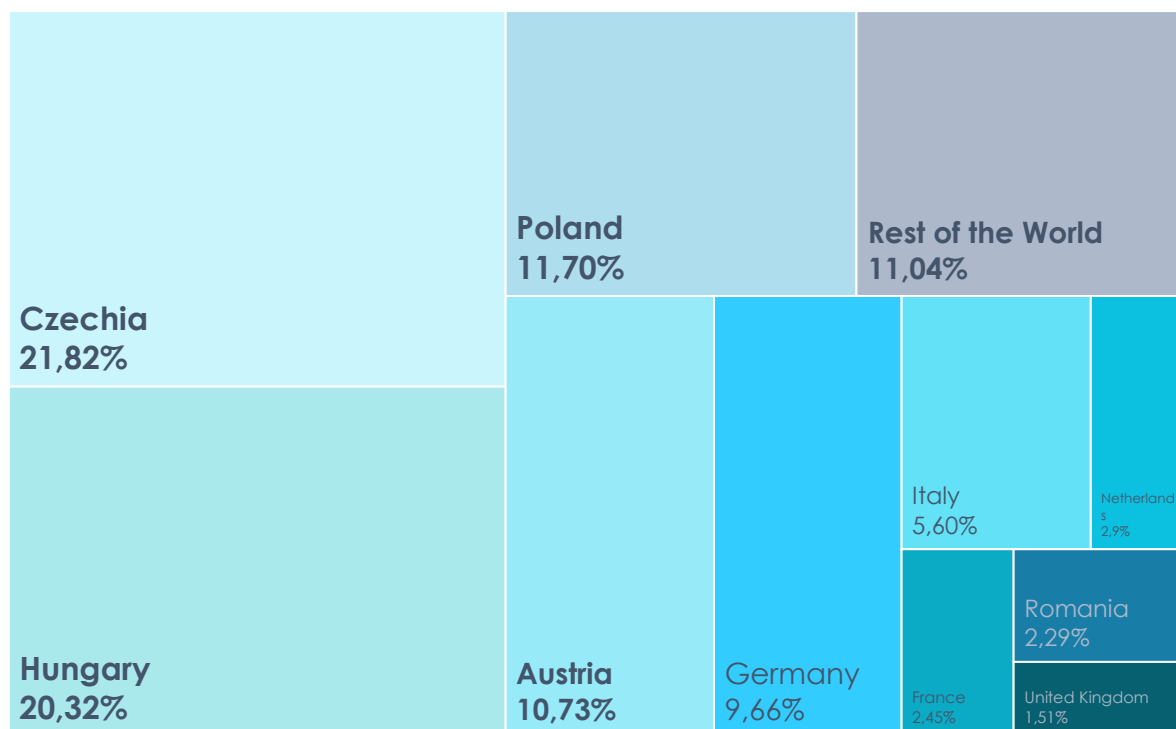
Annex 5 - Breakdown of international food trade by product category in 2022



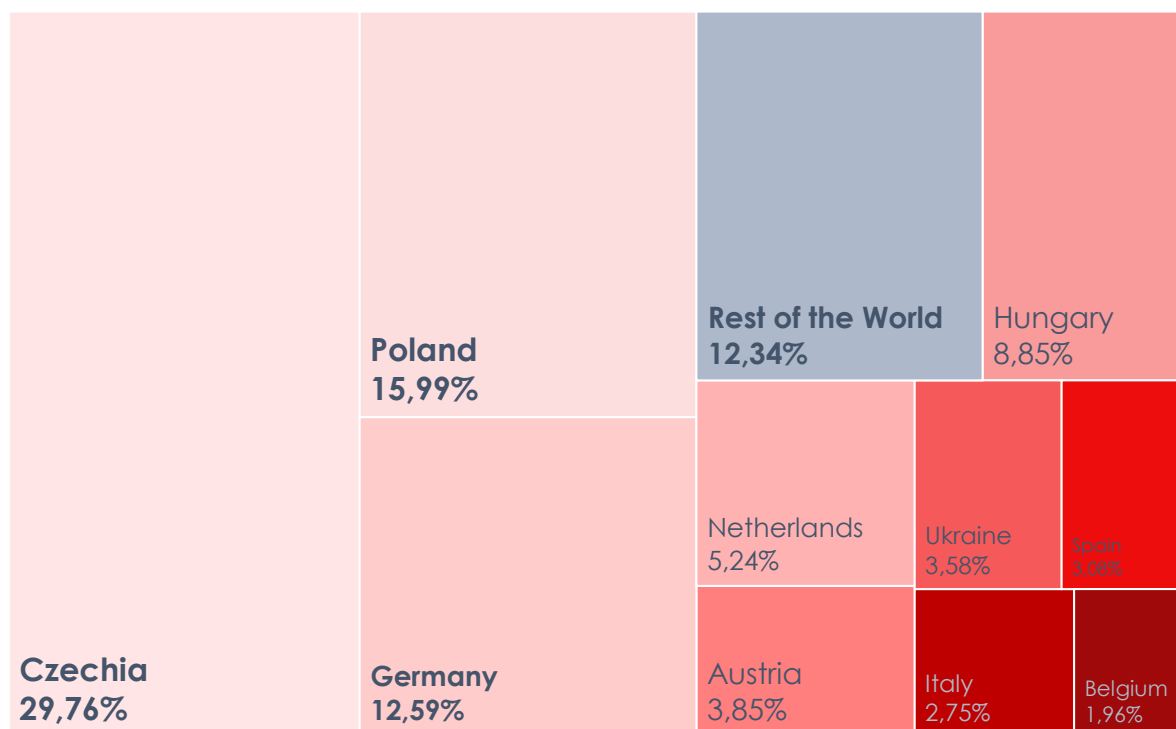
Source: Author's own calculations based on data from the FAOstat database

Annex 6 - Breakdown of international food trade by partner country in 2022

Export



Import



Source: Author's own calculations based on data from the FAOstat database

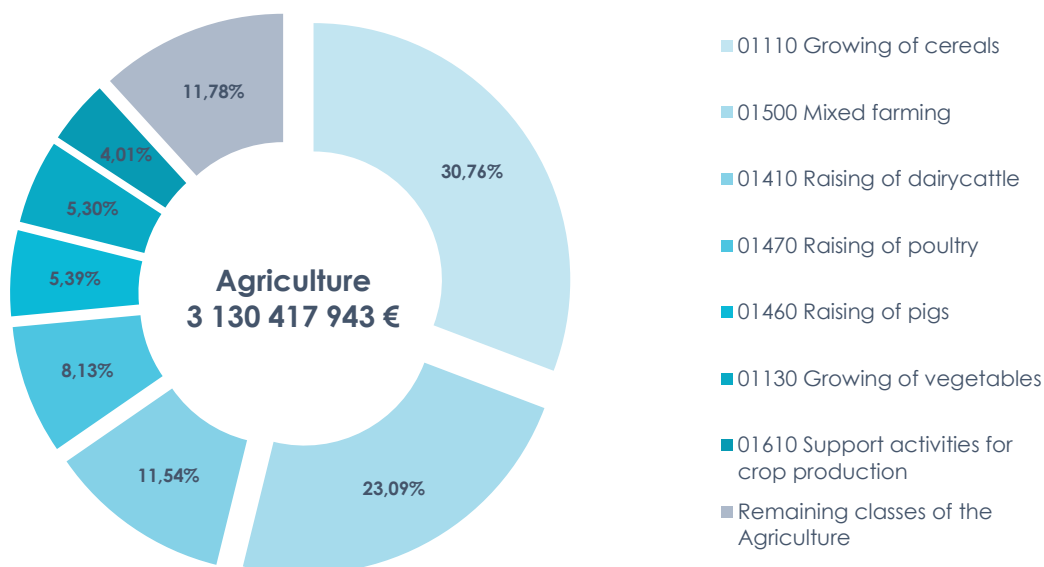
Annex 7 – List of economic activities defining food sectors

	NACE kód	Name of economic activity
Agriculture	01110	Growing of cereals
	01120	Growing of rice
	01130	Growing of vegetables
	01140	Growing of sugar cane
	01190	Growing of other non-perennial crops
	01210	Growing of grapes
	01240	Growing of pome fruits and stone fruits
	01250	Growing of other tree and bush fruits and nuts
	01280	Growing of spices
	01290	Growing of other perennial crops
	01300	Plant propagation
	01410	Raising of dairy cattle
	01420	Raising of other cattle and buffaloes
	01430	Raising of horses and other equines
	01450	Raising of sheep and goats
	01460	Raising of pigs
	01470	Raising of poultry
	01490	Raising of other animals
	01500	Mixed farming
	01610	Support activities for crop production
	01620	Support activities for animal production
	01630	Post-harvest crop activities
	01640	Seed processing for propagation
Manufacture of food	10110	Processing and preserving of meat
	10120	Processing and preserving of poultry meat
	10130	Production of meat products
	10200	Processing and preserving of fish
	10310	Processing and preserving of potatoes
	10320	Manufacture of fruit and vegetable juice
	10390	Processing and preserving of fruit and vegetables
	10410	Manufacture of oils and fats
	10510	Manufacture of dairy products
	10520	Manufacture of ice cream
	10610	Manufacture of grain mill products
	10620	Manufacture of starches and starch products
	10710	Manufacture of bread, fresh pastry goods and cakes
	10720	Manufacture of rusks and biscuits
	10730	Manufacture of macaroni, noodles and couscous
	10810	Manufacture of sugar
	10820	Manufacture of cocoa, chocolate and confectionery
	10830	Processing of tea and coffee
	10840	Manufacture of condiments and seasonings
Manufacture of beverages	10850	Manufacture of prepared meals and dishes
		Manufacture of homogenised food preparations and dietetic food
	10860	
	10890	Manufacture of other food products
	11010	Distilling, rectifying and blending of spirits
	11020	Manufacture of wine from grape
	11030	Manufacture of cider and other fruit wines
	11040	Manufacture of other non-distilled fermented beverages
	11050	Manufacture of beer
	11060	Manufacture of malt
Wholesale	11070	Manufacture of soft drinks
	46210	Wholesale of grain, seeds and animal feeds
	46310	Wholesale of fruit and vegetables
	46320	Wholesale of meat and meat products
	46330	Wholesale of dairy products, eggs, oils and fats
	46340	Wholesale of beverages
	46360	Wholesale of sugar, chocolate and confectionery
	46370	Wholesale of coffee, tea, cocoa and spices
	46380	Wholesale of other food
	46390	Non-specialised wholesale of food
Retail	47110	Retail sale in non-specialised stores with food
	47210	Retail sale of fruit and vegetables
	47220	Retail sale of meat and meat products
	47230	Retail sale of fish
	47240	Retail sale of bread, cakes and flour confectionery
	47250	Retail sale of beverages
	47290	Other retail sale of food

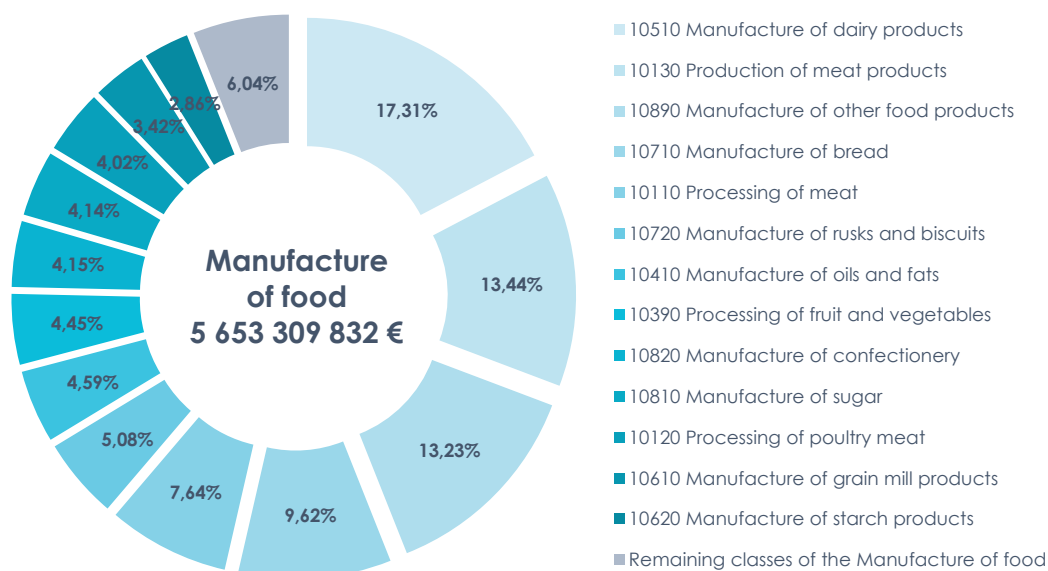
Source: Author's own elaboration based on the statistical classification of economic activities NACE Rev. 2

Annex 8 - Total production by industry within food sectors in 2023 (NACE 4-digit)

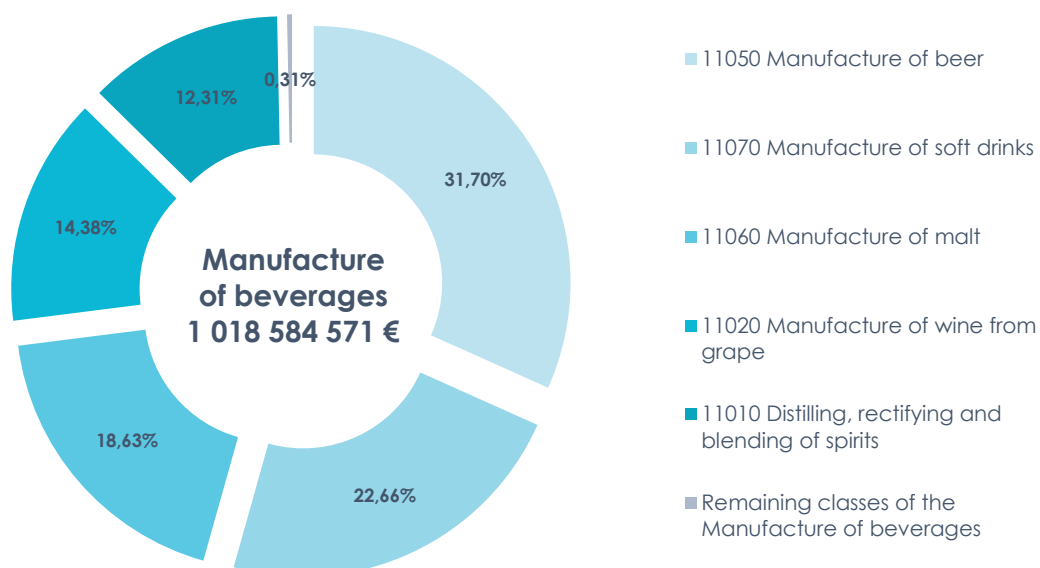
Agriculture (NACE 01)



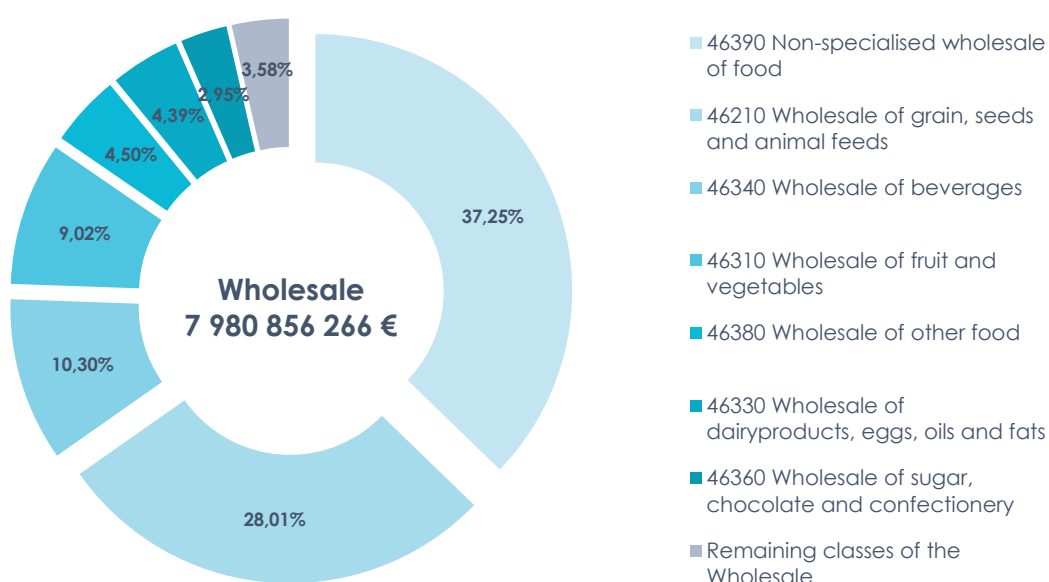
Manufacture of food (NACE 10)



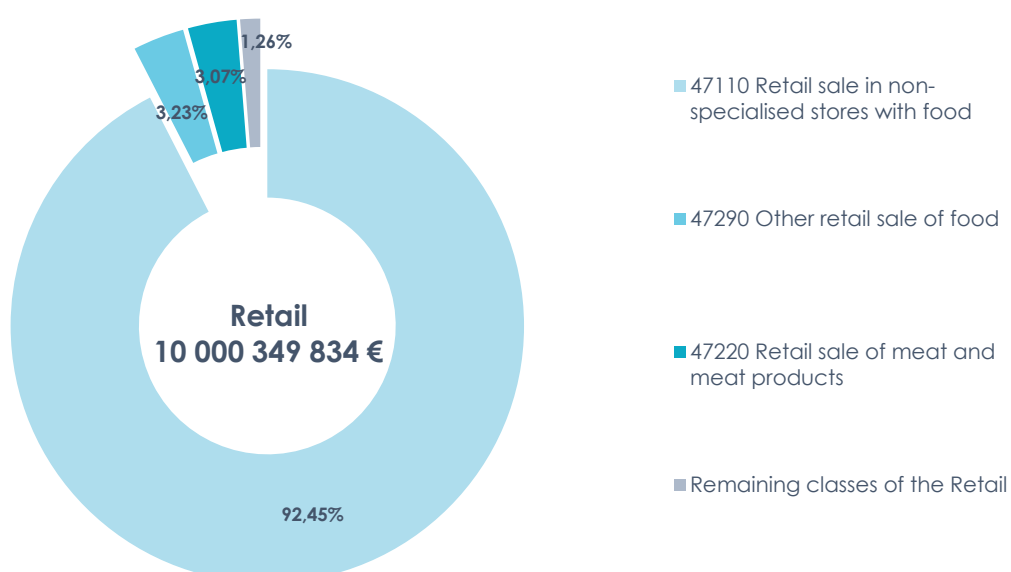
Manufacture of beverages (NACE 11)



Wholesale (NACE 46)

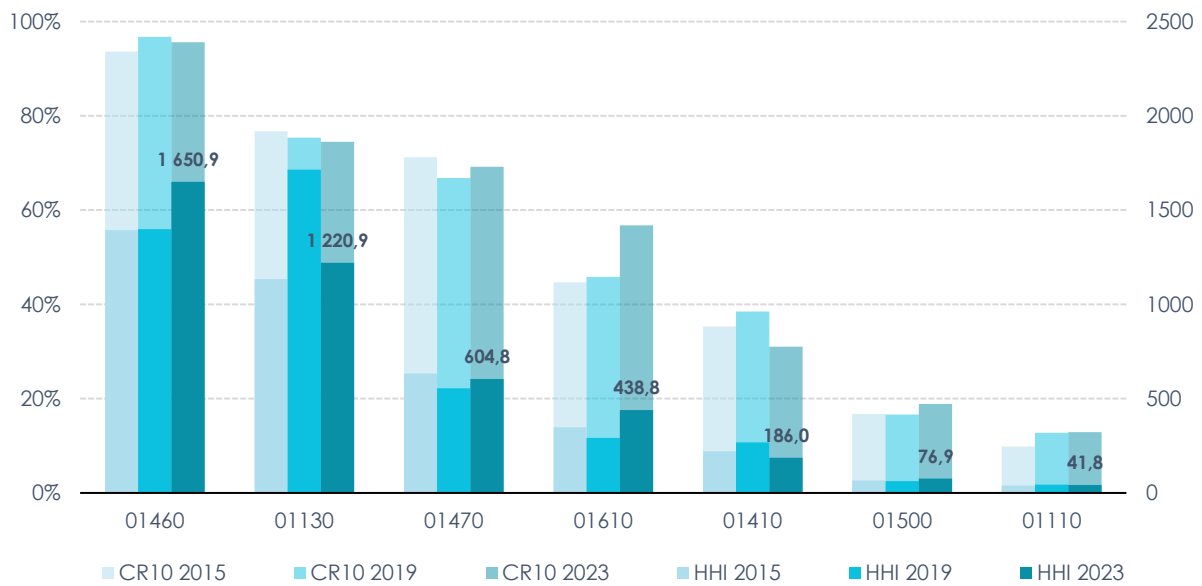


Retail (NACE 47)

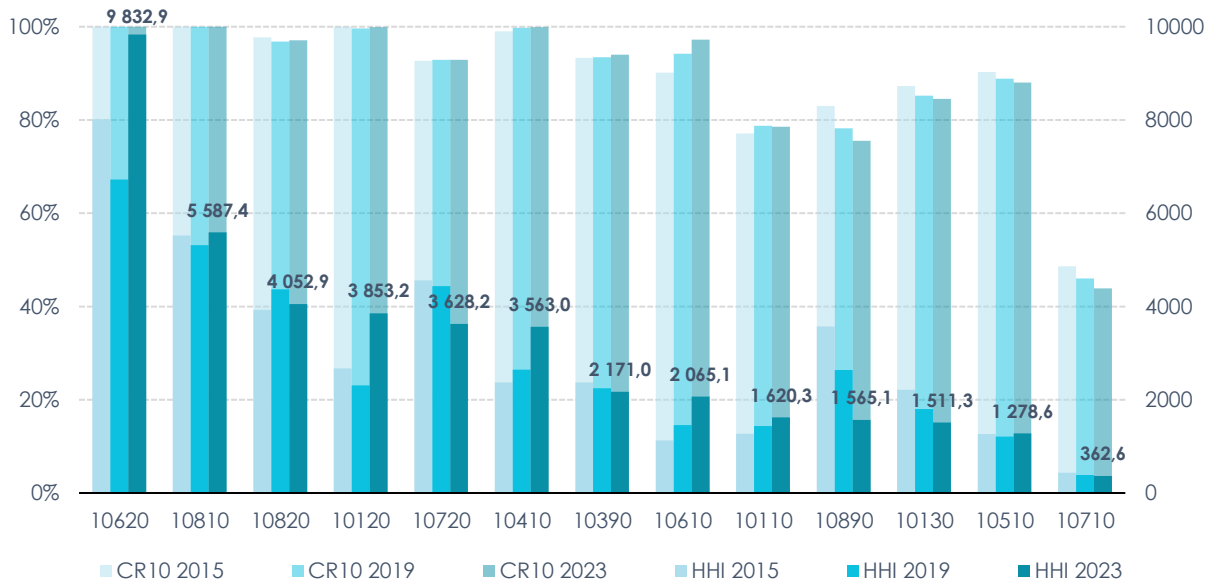


Annex 9 - Concentration indicators in food sectors (NACE 4-digit)

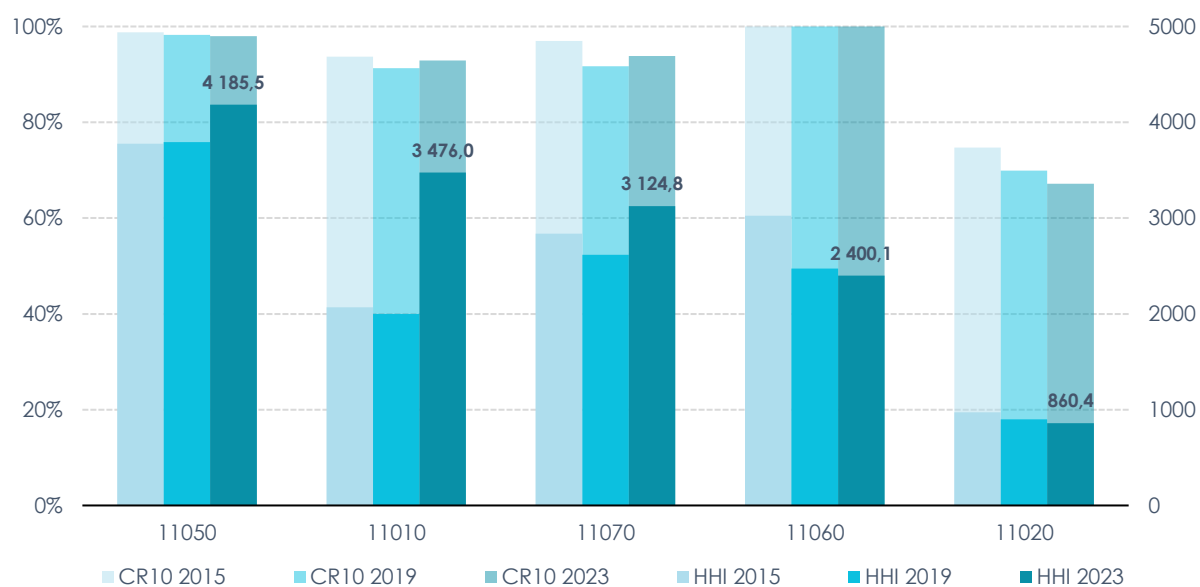
Agriculture (NACE 01)



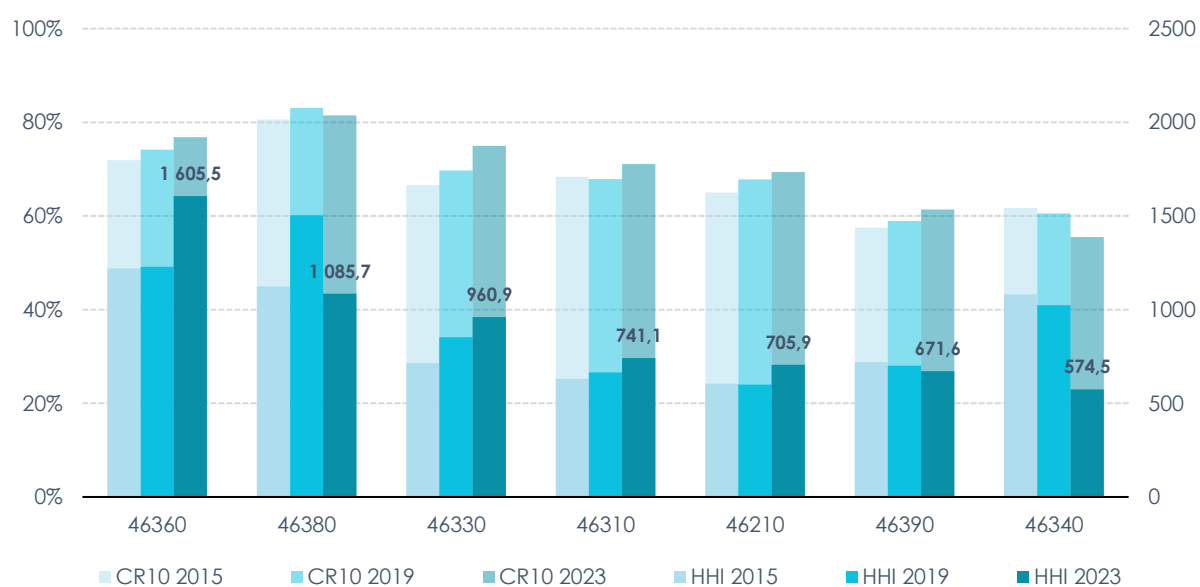
Manufacture of food (NACE 10)



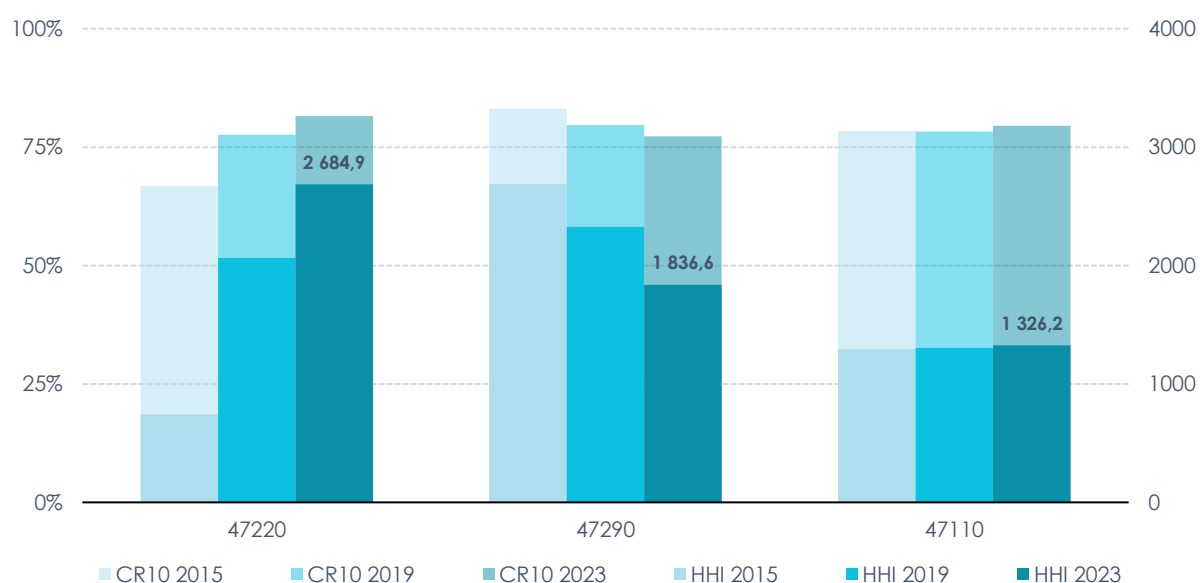
Manufacture of beverages (NACE 11)



Wholesale (NACE 46)



Retail (NACE 47)



Source: Author's own calculations based on data from the Register of Financial Statements