

Market orientation: Wheat-to-bread supply chain in France and UK

Research Findings Brief
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Economic and governance analyses

This brief summarises key findings from economic and governance analyses using a suite of tools to provide in-depth understanding of the functioning of the wheat-to-bread value chain in France and the UK.

Global wheat price

France (Euronext) is a “price leader” on the global wheat market.

Value chain governance

Higher concentrations of value chain actors in UK compared to France.

Global wheat market dynamics

The global wheat export has grown significantly in the last two decades, reaching 203 million t (MT) in 2020 compared to 98 MT in 2000. This significant growth was greatly enabled by the emergence of the large wheat exporters from the Black Sea region (mainly Russia, Ukraine and Kazakhstan). These countries made a tremendous switch from being large wheat importers to becoming the largest wheat exporters globally. This is especially true for Russia that contributed 35% of the global wheat export growth. In contrast, the position of France and the USA in the physical trade of wheat globally has weakened over the last decade, as French and USA wheat exporters now need to compete with the Black Sea exporters that are serving the import markets at lower costs.

Despite the growing importance of the countries from the Black Sea region, wheat prices in France and the USA are benchmark world wheat prices as these countries are the most important wheat markets for trading wheat futures (Svanidze & Đurić, 2021). Thus, wheat futures determined on Euronext (France) or Chicago Board of Trade (CBOT)¹ are transmitted to other large wheat exporting markets such as Argentina, Australia, Canada, Kazakhstan, Russia, and Ukraine. The French Euronext futures market gained its importance as a global benchmark, especially after 2015 when the USA prices started following price developments on the Euronext (Ahmed, 2021)².

France is one of the most important actors in the EU grain sector as well. Concerning the domestic wheat-to-bread value chain, its main characteristic is the strong integration of the downstream sector. This is especially the case for integrating large millers and industrial bakeries (Loveluck & Aubert, 2019)³.

Value chain governance

Governance analysis is a tool to identify lead actors, trading practices, inter-firm relations, and structural elements along the value chain to better understand if fairness, in terms of perceived market power and fair value distribution, is or could be an issue in the French and UK wheat-to-bread value chains.

The UK and France have relatively different wheat-to-bread supply chains by focusing on milling and baking industries. The size of the wheat harvest in France was 29.5 MT in 2020, which was 17% less than the five-year average previously due to rainfall shortages. The UK harvests less wheat than France (13.5 MT in 2019), but more wheat is milled into flour. In 2019,

¹ Also Kansas City Board of Trade (KCBT) and Minneapolis Grain Exchange (MGEX) play an important role for price formation in the USA.

² Ahmed, O. Assessing the current situation on the world wheat market leadership: Using the semi-parametric approach. *Mathematics* **2021**, *9*, 115.

³ Loveluck, W., and Aubert, P.-M. (2019). Governance of French dairy to liquid milk value chain. Chapter 3 in David Barling and Jennifer Gresham (Eds.) (2019) *Governance in European Food Value chains*. VALUMICS “Understanding Food Value Chains and Network Dynamics”, funded by European Union’s Horizon 2020 research and innovation programme GA No 727243. Deliverable: D5.1, University of Hertfordshire, UK, 237p.

384 mills were controlled by 330 enterprises in France. The available data shows that approximately 5 MT of wheat are processed on French milling sites annually, which is mainly turned into 4 MT of flour for artisanal or industrial baking. Furthermore, four enterprises with 32 milling units processed 50% of in-demand flour in 2019. According to the available statistics for 2019, approximately 2.5 MT of flour was used for baking purposes in France, with 56% used by traditional bakeries and artisanal pastry makers, 35% by industrial bakeries and pastry makers, and 9% by supermarkets.

In the UK, approximately 6.2 MT is used by the flour milling industry to produce 5 MT of flour. In 2018, 30 industrial enterprises were operating 51 mills. The four largest enterprises accounted for approximately 65% of UK flour production. In contrast to France, approximately 80–85% of the bread consumption in the UK is from industrial sources. The UK baking sector can be broken down into industrial plant bakeries, in-store bakeries, and craft bakeries, with 15% of flour consumed by non-industrial bakeries. This structure shows that the wheat-to-bread supply chain is more concentrated by considering the number of actors and their size of activities in the UK than France (Čechura and Jaghdani, 2021).

Market competitiveness, efficiency and technical change in the wheat-to-bread value chain

The analysis of competitiveness, efficiency and technical change are tools to provide an in-depth understanding of the underlying factors driving the competitive advantage of wheat-to-bread value chain actors in selected EU countries.

The VALUMICS study on the “Assessment of price formation and market power along the food chains” (Svanidze et al., 2020) investigates market power for the milling and bakery industry in the UK and France. As far as the milling industry is concerned, both countries indicate a certain level of market imperfections. However, for France, a higher level of imperfections is evident. This might be a result of the value chain governance. Whereas milling enterprises trade directly with farmers in France, the value chain in the UK is characterized by more merchants and few milling sites.

Moreover, we can observe the highest values of market power indices in France. Then, comparing the input and output milling market, the output market shows low market imperfections in France. Only a little evidence for bargaining power can be found in the UK. This might be because more suppliers are available in France as compared to the UK. The analysis also revealed the differences in bargaining power for different size groups of millers. In particular, a certain level of bargaining power can be observed even with small and medium milling enterprises in both France and the UK. This might be the evidence that especially small companies concentrate the activities in niche markets.

The baking industry shows lower market imperfections in the input and output market for both France and the UK. In the UK, both the milling and baking industries are characterized by high concentrations. However, the bargaining power of the bakery industry in the UK with their flour suppliers is higher than the upstream millers’ market power. Then, the output market is affected by the power of retailers and market demand. Additionally, industrial bakeries compete with rivals and artisan bakeries. As in the milling industry, smaller bakeries at the industry level show relatively high values of Lerner⁴ index in both countries, indicating the operation in niche markets (Čechura & Jaghdani, 2021).

Another component of the study on scale/size efficiency investigates whether a firm operates at its “optimal size” (Čechura et al., 2020 Deliverable 5.6) (the study included the countries in VALUMICS consortium: Austria, Belgium, Czechia, Germany, Finland, France, Italy, Ireland, Romania, Spain, Sweden, the UK). The analysis finds an indication of diseconomies of scale for the majority of countries in cereal production. In particular, the results show increasing

Market power

Market imperfections are more pronounced on input market in milling industry. Small millers and bakers operate in niche markets to get higher mark up/down.

Scale efficiency

Scale efficiency provides considerable space for productivity improvements in cereal production. Milling and bakery industry indicate optimal size of operations.

⁴ Lerner index is an estimated measure of a firm’s output market power (the ability to charge markups of price over marginal costs), ranging from a low value of 0 (representing perfect competition where price is equal to marginal costs) to high value of 1 (representing monopoly).

Technical efficiency

High overall technical efficiency in agriculture as well as milling and bakery industries.

returns to scale, suggesting that farmers have a substantial potential to improve their productivity by increasing the scale of operations. On the other hand, the food processing industry (milling and bakery) is characterized by constant returns to scale; that is, the food processors are scale efficient and produce in optimal size of operations.

The overall efficiency is high in agriculture as well as in food processing. This indicates that inputs are efficiently exploited. However, significant differences among the countries in the efficiency of inputs use were revealed. On average, 75% of farms can reduce costs up to 17% and 75% of processors up to 10% when operating on the technological frontier. Finally, the results foreshadow a potential gain of productivity by positive technological change (technological improvements), especially in bakeries, where the magnitude of technological progress is more pronounced than agriculture and milling industry.

Wheat trade duration

Trade duration analysis is a tool to assess the length of trade relationships, i.e. the speed with which firms/partners/countries enter and exit wheat trade and the risk associated with this activity. The trade survival rate indicates how likely the export activities survive over time with the same trading partner.

Trade duration

France has a long-term wheat trade relationship only with the EU partners as there are no intra-EU trade barriers compared to non-EU trade.

The results of the VALUMICS study (Jaghdani et al., 2020, Deliverable 5.3) show that for the period 2001-2018, France has produced on average 36,6 MT of wheat and exported 17.3 MT annually. The level of production and export varies during this period. Still, in 2002, 35.2% of the produced wheat was exported which is the minimum. In 2016, 62.7% of the produced wheat was exported, which is the maximum for the period. The eight leading importers of the French wheat are Algeria, Belgium, Netherlands, Morocco, Italy, Spain, Egypt and Portugal. These eight countries account for 67.8% (minimum) to 81.3% (maximum) of total wheat export in this period. Algeria is the main importer of French wheat. The survival rate between the French wheat export and the main global importers is rather high. In particular, for most firms, the likelihood that the wheat trade survives after two years is about 45%, after five years is about 32%, after ten years is about 26%, and after eighteen years is about 20%. This rate is clearly different between EU and Non-EU countries after the first year. About 75% of trade relations with non-EU partners die out after seventh years on average. The same rate is less than 45% for EU countries. Our study shows that as the size of trade increases, the possibility of trade duration also increases. As more spells is observed between partners, the possibilities of trade termination are higher. These results show that the wheat value chain does depend on stable trading partners at the country level specially with the EU partners.

Concluding remarks

Global wheat price

The analysis confirms that, when it comes to global wheat price formation, the French market (i.e. Euronext commodity exchange) is the leading wheat market transmitting price signals to other exporting markets in Russia, Ukraine, Canada, the USA and Argentina

The results of the analysis of market power along the French and UK wheat-to-bread value chains indicate a certain degree of market imperfections for milling and bakery industries in both countries. Higher market imbalances are identified for the French milling industry compared to the UK case. Similar results are obtained for the baking industry in both countries. The results indicate diseconomies of scale for most countries in cereal production, suggesting considerable space for farm productivity improvements by increasing the scale of operations. On the other hand, the food processors (milling and bakery) produce in optimal size of operations. The overall efficiency is high in cereal production as well as in the milling and bakery industry. On average, 75% of farms can reduce costs up to 17%. Furthermore, about 75% of processors can reduce their costs up to 10% when operating on the technological frontier. Technological change as another driver of productivity growth was pronounced, especially in the bakery industry.

The wheat trade duration analysis indicates that the lack of intra-EU trade barriers significantly contributes to the persistence of the long-term trade relations between France and other EU countries. Although France exports more wheat out of the EU, trade relations with non-EU partners are more unstable and last much shorter compared to the EU partners.

Key Outcome of economic and governance analysis of the wheat-to-bread value chains in France and UK

- *France plays an important role in setting the global wheat reference price;*
 - *UK has higher concentration of actors along the wheat-to-bread value chain compared to France;*
 - *Market imperfections are mainly present in milling industries (on input markets);*
 - *Small millers and bakers operate in niche markets to obtain higher markup;*
 - *Adjustments in the scale of operations provide considerable space for productivity improvements in cereal production;*
 - *Milling and baking industries indicate optimal size of operations and high overall technical efficiency;*
 - *France has more persistent trade relations with EU partners compared to non-EU (lack of intra-EU trade barriers plays the crucial role).*
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Key sources for further information

This brief summarises results from the VALUMICS wheat-to-bread case study on economic and governance analysis as reported in the deliverables listed below.

To discuss the research presented in this brief, please contact duric@iamo.de or respective authors:

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Deliverable reports:

Čechura, L., Žáková Kroupová, Z., Rumánková, L., Jaghdani, T.J., Samoggia, A., Thakur, M. (2020). Assessment of Economics of scale and technical change along the food chain. The VALUMICS project funded by EU Horizon 2020 G.A. No 727243.

Deliverable: D5.6, Czech University of Life Sciences, Prague, 169 pages. DOI <https://doi.org/10.5281/zenodo.5161347>

Jaghdani, T. J., Johansen, U., Thakur, M., and Đurić, I. (2020). **Persistence of supply chain relations**. The VALUMICS project funded by EU Horizon 2020 G.A. No 727243. **Deliverable: D5.3**, Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Germany, 114 pages. DOI <https://doi.org/10.5281/zenodo.5161193>

Pierre-Marie Aubert and William Loveluck (2019) Governance of French Wheat to Bread Value Chain, Chapter 9. *In*: Barling, D. and Gresham, J. (Eds.) (2019) **Governance in European Food Value Chains**. VALUMICS “Understanding Food Value Chains and Network Dynamics”, funded by European Union’s Horizon 2020 research and innovation programme GA No 727243. **Deliverable: D5.1**, University of Hertfordshire, UK, 237p. <https://doi.org/10.5281/zenodo.4956324>

Svanidze, M., Čechura L., Đurić, I., Jaghdani, T. J., Olafsdottir, G., Thakur, M., Samoggia, A., Esposito, G., and Del Prete, M. (2020). **Assessment of price formation and market power along the food chains**. The VALUMICS project funded by EU Horizon 2020 G.A. No 727243. **Deliverable: D5.5**, Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Germany, 114 pages. DOI <https://doi.org/10.5281/zenodo.5161247>

Published scientific papers:

Čechura, L.; Jaghdani, T.J.; Market Imperfections within the European Wheat Value Chain: The Case of France and the United Kingdom. *Agriculture* 2021, 11, 838. <https://doi.org/10.3390/agriculture11090838>

Svanidze, M., Đurić, I. (2021). Global Wheat Market Dynamics: What is the Role of the EU and the Black Sea Wheat Exporters? *Agriculture*, 11(8), 799. <https://doi.org/10.3390/agriculture11080799>

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