Post Doctoral Position in Economics/Finance, Rennes France

Project Title: How the European dairy industry should adapt to the new volatile context?

The European Union has radically reformed its milk policy in the last decade by reducing price support levels and removing production quotas. The European dairy industry has consequently faced utterly different markets prices dynamics which were displaying higher volatility. This even leads to two periods of "milk crisis" in the last ten years (during 2009 and 2016), when the milk and dairy product prices were particularly low. In both periods, public debates on the efficiency of the milk reform reopen. Proponents of the reform argue that, with less public intervention on the physical dairy markets, futures market will emerge and allow operators to efficiently manage their price risks. They add that public intervention should help the initial development of these futures market. Nevertheless, while some futures market defined on European dairy products (butter and skimmed milk powder) exist for some years now, the liquidity of these markets remains very limited, with very low open positions and daily trading volumes.

In this context, the general purpose of this project is to define optimal risk management decisions for milk actors. This uncertain environment affects all actors in the milk chain, ranging from milk producers to dairy product consumers. This research project will elaborate on two first statistical analyses that we already conduct. First, in Bagnarosa et al. (2020a), we demonstrated that the instability on dairy prices trickled down to the dairy industry margins and has unevenly impacted companies in this sector. To reach this conclusion, we estimated the operational risk posed by commodity market exposure in dairy firms through a multivariate mixed-data sampling (MIDAS) conditional quantile regression technique, and thus evidenced a direct connection between dairy prices and margins and the operational performance of European dairy firms. We argue that dairy firms appear to not be managing their price risk effectively, especially the small and medium-sized companies with a high operating leverage. Second, in Bagnarosa et al (2020b), we propose an original economic and statistical methods to understand why the liquidity of the dairy futures markets remains limited so far. Our economic analysis relying on accounting data and behavioural simulations reveals that the production flexibility of dairy processors and the milk price mechanisms are important drivers of the liquidity of futures market, in addition to the traditional transaction costs and risk aversion drivers. Our statistical analysis using monthly spot dairy product prices and threshold cointegration techniques confirms the productive responses of dairy processors. We finally find that both European dairy processors and milk producers can benefit from efficient futures dairy markets, by expanding their business and saving costs on milk price negotiations.

Through this research project, we will first improve our previous statistical analyses by bringing closer the macro/micro-economic theories about agents' behaviour or equilibrium price and the financial theory about price discovery process. We will devise a structural vector auto-regressive (SVAR) model suitable for the dairy industry, that will be implemented with up-to-date data and allowing for different regimes (before/during/after the milk reforms). This SVAR model will build on an hedonic pricing model (as in Chavas and Kim, 2005) with improvement regarding dairy operators' optimal production choices conditionally to costs filtration. We will then define optimal risk management decisions for the different actors of the dairy supply chain, taken into account the remaining policy measures defined at the European level (in particular lower intervention prices on butter and skimmed milk powder).

Bagnarosa G., Cummins M., Dowling M., Kearney F. (2020a). A MIDAS quantile regression technique to determine commodity risk in European dairy firms.

Bagnarosa G., Cordier J., Gohin A. (2020b). Understanding the European Futures Markets on Dairy Products: a Multi-Product Perspective.

Chavas, J.P. and Kim, K. (2006). Cointegration relationships and hedonic pricing of differentiated commodities: an application to price dynamics in the US dairy sector. *Applied Economics,* 37: 1813:1827

Qualifications:

The applicant should have obtained a PhD degree in economics of finance and should be familiar with the statistical methods. The applicant should demonstrate a potential to publish in leading international peer-reviewed journals and be rigorous, able to work within a team.

Supervision:

The postdoc will work under the joint supervision of Guillaume Bagnarosa (RSB) and Alexandre Gohin (INRAE).

Salary and conditions of employment:

Salary will be in accordance with the French regulation depending on experience.

Location of job: Rennes, France.

Job start date: January 2021.

Job duration: 12 months.

Applicants should sent (i) a cover letter to motivate how this position fits their professional project and why they think they suit the offered job, (ii) a detailed curriculum vitae along with a full list of references. Documents should be sent in electronic form to Guillaume Bagnarosa (Guillaume.Bagnarosa@rennes-sb.com) and Alexandre Gohin (Alexandre.Gohin@inrae.fr)

INRAE is an equal opportunity employer.