

**Title:** Technical, economic, environmental and social efficiency of French dairy farms under protected designation of origin

**Abstract:** The objective of the PhD research is to identify the possible improvement of dairy farms with respect to technical, economic, social and environmental criteria according to their location and their breeding system using the Total Productivity Factors index (Färe-Primont Index) and its analyze with the Data Envelopment Analysis (DEA) method. The expected results are: (1) To make a methodological contribution to the work in eco-efficiency taking into account environmental and social externalities. (2) To discuss the Porter's hypothesis which environmental constraints would encourage producers to adopt innovations that allow them to improve their performance. (3) To mobilize the portfolio theory analysis framework to determine the "optimal" composition of productive and environmental assets to secure long-term performance and to improve the resilience of dairy farms.

**Context:** The main objective of this PhD research is to compare the overall performance of dairy farms and to identify potential margins for dairy farmers to progress in terms of technical, economic, social and environmental drivers and their location and livestock system. The methodology to assess the overall performance of dairy farms is based on total factor productivity (TFP) measurement and its evolution by using the Färe-Primont index. The decomposition of the index will be done with the Data Envelopment Analysis (DEA) method. The measure of TFP is to compare an aggregate output (all products) to an aggregated input (all factors of production). The approach allows to give a large vision of the performance and to take into account potential substitutions of the factors of production. This decomposition will make it possible to identify the share of managerial capacities, scaling effects, range effects and the adoption of innovation on the total performance of dairy farms. This is an important issue and shows how livestock farms can make long-term commitments to sustainable strategies by combining economic, social and environmental performance.

**The scientific objectives of this PhD research are:**

- i) From a methodological point of view, the challenge is to integrate into the Data Envelopment Analysis new variables of interest allowing to consider social and environmental factors in the measures of effectiveness and thus to contribute to the literature on measures of eco-efficiency.
- ii) Theoretically, this model should be used in order to highlight factors explaining the long-term differences in efficiency. This approach will make it possible to evaluate and compare the resilience of dairy farming systems (PDOs, not PDOs and Organic Farming label), which are confronted with hazards (climatic hazards, health risks, hazards of the market, etc.). The Theoretical framework of the portfolio theory will determine the "optimal" composition of productive and environmental assets (Dragicevic, 2016) to secure total performance.
- iii) It is also from a theoretical point of view we would like to discuss the Porter hypothesis (1995), which assumes that environmental constraints resulting from policy implementation force farmers to make changes by adopting technological innovations in order to increase their productivity and remain competitive despite these constraints.
- iv) From a policy making point of view, we will propose, at the relevant geographical scale, policy recommendations on the incentives to give to the farmers (concerning the 2nd pillar of the CAP) so that the total performance is improved to ensure a sustainable development at the relevant territorial scale.

**PhD Supervisors :** Dominique Vollet (Irstea) and Philippe Jeanneaux (VetAgro Sup)

**Discipline :** Economics

**Location:** « Campus universitaire des Cézeaux » (Aubière) and « campus agronomique » (Lempdes) located close to Clermont-Ferrand (France)

**PhD duration:** octobre 2018 à octobre 2021

**University:** ED 245 - École Doctorale des Sciences Économiques, Juridiques, Politiques et de Gestion – Université Clermont Auvergne

**Partnership:** This project is in line with the research projects carried out over the past 10 years on these themes (Eurentana Project, PerfEA project, PSDR 3 Amen ; PSDR 4 New-Deal, FAO-PGI Project, 4 PhD research on livestock systems and strategy of differentiation (Dakpo, 2015; Diallo, 2017; Ngoulma, 2017 ; Tankam, 2015). Moreover, this thesis is part of the reflection carried out by some professionals of the dairy sector and especially CNIEL and CNAOL. A PhD committee will therefore gather some partners, including researchers (Hervé Dakpo, Laure Latruffe, Dominique Barjolle, Arnaud Dragicevic), FranceAgriMer, INAO and stakeholders of the dairy sector (RMT Fromages de Terroirs and CNAOL). This project is therefore in a rich environment enabling collaboration between researchers, professionals and public institutions.

**Skills requirement:**

Master Degree or Engineer degree si required

- Interest for statistics
- French Car Licence « B »
- Effective team work skills
- Good knowledge of English and French, spoken and written