Agricultural Systems 153 (2017) 1–10

Contents lists available at ScienceDirect

Agricultural Systems

journal homepage: www.elsevier.com/locate/agsy

Could EU dairy quota removal favour some dairy production systems over others? The case of French dairy production systems

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ARTICLE INFO

Article history:
Received 4 August 2016
Received in revised form 6 January 2017
Accepted 10 January 2017
Available online xxxx

Keywords:
Dairy production system
Dairy quotas
Partial equilibrium modelling
Demand

ABSTRACT

Since the 1st of April 2015, European dairy quotas, one of the iconic instruments of the Common Agricultural Policy, have been removed. With this removal, the European Commission expects to develop a more competitive and market-oriented dairy sector in light of increasing world food demand. In countries such as France, where quotas were administratively managed and strongly linked to land, this system maintained dairy production in all regions but also sustained inefficient dairy production systems. With quota removal, changes such as concentration of production in the most favourable areas, enlargement of dairy farms and restructuring of the dairy sector to increase the efficiency of production systems are likely. The impacts of quota removal on markets, as well as the localisation of dairy production, have been widely studied. The impacts on the distribution of dairy production across various production systems have been less studied. We use MATSIM-LUCA, a partial equilibrium economic model, to assess the impacts of dairy quota removal on i) markets and prices and ii) redistribution of production among dairy production systems in France. We consider several world demand scenarios for dairy and meat products to test the sensitivity of our results to future world demand for these products.

Our results confirm the findings of previous studies, i.e., quota removal causes an increase in milk production and a decrease in raw milk prices in the European Union. Market effects are similar regardless of the world demand scenario, but they are markedly higher in the high world demand scenario. Our results regarding the impacts of quota removal on the shares of different dairy production systems in France are new and original. We find that quota removal alone has limited impacts on the redistribution of production across dairy systems. Quota removal associated with increased world demand has stronger impacts, but the expected redistribution effects towards more efficient systems remain rather limited even then. Our results show that the very intensive maize system is the most responsive to changes in the production context.

1. Introduction

Over the last 30 years, the Common Agricultural Policy (CAP) has strongly affected the European dairy sector's structure. Dairy production quotas were one of the iconic instruments of the CAP. They were implemented in 1984 in the face of dairy oversupply and low milk prices in the European Union (EU). Based on reference volumes from 1983, a quota was allocated to each Member State (MS) to control milk production, stabilize milk prices and producer incomes and reduce the European budget for market support (Barthélemy and David, 1999; JRC and IPTS, 2009; Kroll et al., 2010). Despite several reforms, the European dairy policy remained almost unchanged until the Luxembourg reform of 2003, which introduced several modifications: i) a gradual decrease in the intervention prices for butter and skimmed milk powder; ii) gradual increases in dairy quotas until 2013; and iii) the introduction of fully decoupled direct payments (Bouamra-Mechemache et al., 2009; European Commission, 2004). This decision was motivated both by inefficiencies generated by supply management policies leading to the maintenance of inefficient dairy producers (Colman, 2000) and by a favourable world dairy market outlook at the time, which did not justify maintaining such a policy (Commission of the European Communities, 2008).

With this reform, one of the goals of the European Commission was to develop a more market-oriented and competitive EU dairy sector in light of increasing milk and dairy demand at the world level. In 2015, the European dairy sector faced a more challenging modification of its production context as the "Health Check" of the

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http://dx.doi.org/10.1016/j.agsy.2017.01.004
0308-521X/

CAP in 2008 endorsed the removal of quotas in spring 2015 after a "soft landing" period, i.e., a gradual increase in the milk quota (European Commission, 2009).

This change in context was also expected to modify the distribution of dairy production across the different dairy production systems (or the shares of the different dairy production systems of overall dairy production), especially in countries, such as France, where quotas were administratively managed (Perrot et al., 2014). In France, this type of management had been implemented to meet two objectives: i) to maintain dairy production across the entire territory and ii) to encourage the development of medium-sized farms and facilitate the setting up of young farmers (Chatellier et al., 2013b; Lelyon et al., 2012; Pflimlin et al., 2009). With this management, the comparative advantages of French regions were restrained, and the restructuring of the dairy production sector was limited (Donnellan et al., 2009). With quota removal, increased competition between regions is expected, and the concentration of milk production in the most favourable areas is considered likely (Kroll et al., 2010; Lelyon et al., 2012; Perrot et al., 2014). Seeking a reduction of supply cost, positive externalities and agglomeration economies are expected to be the drivers of the concentration of dairy farms (Chatellier et al., 2013a; Daniel, 2003; Isik, 2004; Roe et al., 2002). Moreover, the move towards larger dairy farms, initiated before quota removal, is assumed to strengthen (Perrot et al., 2014; Peyraud and Duhem, 2013). The objective of this expansion is to benefit from economies of scale.

The impacts of phasing out dairy quotas on milk prices and on the quantities produced have been widely studied. Most of these studies consider the milk supply at the EU and MS levels (Bouamra-Mechemache et al., 2008a; INRA and University of Wageningen, 2002; Lips and Rieder, 2005; Réquillart et al., 2008; Witzke and Tonini, 2009). In these studies, market effects were assessed through scenario comparisons with projections for 2015 or 2020. Market responses were simulated using partial (INRA and University of Wageningen, 2002; Réquillart et al., 2008; Witzke and Tonini, 2009) or general (Lips and Rieder, 2005) equilibrium models.

All these studies predicted a decrease in milk prices at the European level of 3.8% to 9.8% and an increase in the production of raw milk of 1.5% to 4.8%. The range of these price and quantity changes varied among studies according to the assumptions made about the involved parameters (initial milk quota rent,[1] evolution of demand for dairy products, scenarios implemented, among others). However, several authors emphasised that at the MS level, effects could be more differentiated, depending on the initial quota rent for the MS. Indeed, whereas some MSs are expected to expand their production, it is likely that production will decrease or remain unchanged in other MSs. The consensus view of the European Union (2014) indicates a production expansion for Belgium, Denmark, Netherlands, and Poland, and a decrease for Hungary, Finland, and Romania. For countries such as France, Italy, United Kingdom, and Portugal, the trends are less clear, and production is supposed to be mostly unaffected by the milk quota reform. Chantreuil et al. (2008), using a partial equilibrium model AGMEMOD, confirm these findings. Indeed, they demonstrated that the reform would result in a redistribution of milk production across EU MSs rather than in radical changes in overall EU production.

Several authors have gone a step further and have analysed the effects of quota removal at a regional scale. Focusing on the United Kingdom, Colman et al. (2002), Moss et al. (2008) and Patton et al. (2008) showed differentiated effects of the reform by region and farm size type. Similar studies for EU regions were conducted by the JRC and IPTS (2009) and Kempen et al. (2011). Using CAPRI, a partial equilibrium model, they assessed the effects of different quota exit scenarios on prices, volumes and geographical distributions of milk, beef, and other livestock products, as well as feed production, at the MS region level. They showed great heterogeneity of responses to quota removal, even within a MS. For France, they predicted a decrease in production in lowland areas with low milk density dominated by crop production (Centre, northern and eastern regions), whereas an increase of up to 16% was expected in the western and north-western regions. However, these studies did not establish which dairy systems would develop to supply the increase in milk production. Finally, Henry de Frahan et al. (2011) used a profit maximisation programming model at the farm scale for different farm types to assess the impacts of quota removal on the structure of the dairy production sector in Belgium. They showed that a drop in the milk price resulting from quota removal could lead to three different strategies: expansion of production with an unchanged farm structure, expansion of production with increased farm size, or a decrease in milk production.

None of the studies cited, except Henry de Frahan et al. (2011), specifically investigated the effects of dairy quota removal on dairy production systems. Moreover, most of these studies were conducted assuming a favourable economic context for dairy production, and only a few of them considered alternative contexts of demand or prices (Moss et al., 2008). Dairy quota removal was endorsed by the European Commission particularly to benefit from expected increases in world demand for dairy products. In such a context of growth in demand, this policy would have a positive effect on milk prices, which would partially offset the reduction in prices for European producers due to quota removal. Weaker than expected demand for dairy products would lead to depressed dairy markets, highlighting the importance of the demand context in the assessment of the impacts of dairy quota removal. Current stagnating demand, especially in the EU, provides an interesting case for the exploration of the effects of quota removal in different demand contexts. Moreover, investigating whether quota removal will be favourable to the development of several types of dairy systems and if the demand context for dairy and meat products influences dairy systems' responses is interesting.

Within this paper, we answer these questions using MATSIM-LUCA (Market And Trade SIMulation model for Land Use Change Analysis), a partial equilibrium model of agricultural markets and trade. The originality of this model is the use of agricultural production technology specification inspired by computable general equilibrium models. This allows us to explicitly represent primary production factor markets on the one hand and to represent different dairy production technologies, detailed for France, on the other hand. These dairy production technologies compete directly for primary production factors, including herds. This allowed us to assess the effects of EU dairy quota removal on agricultural markets, prices and quantities and on the shares of different dairy production systems of total French milk production. To the best of our knowledge, this kind of approach has never been implemented. Our results complement previous ones, going beyond the effects of quota removal on aggregated milk supply by detailing the effects of production context changes on seven French dairy production systems.

2. Materials and methods

2.1. Modelling framework

2.1.1. Model description

MATSIM-LUCA is a partial equilibrium model covering 17 world regions and 46 products in different sectors (crop production, livestock production, oilseed processing, sugar production and biofuel production sectors). MATSIM-LUCA allows for testing exogenous shocks resulting from policy or socioeconomic changes and for analysing impacts on world markets equilibrium prices, production, consumption, trade and land use changes. It is unique in the way that it explicitly represents France compared to other regions. Furthermore, its originality lies in the explicit representation of production technologies via Constant

[1] A quota rent is the difference between the price perceived by the producer and the marginal production cost (shadow price) at quota level. It represents the loss of consumer surplus that is transferred to the producer.