

# Structural change in the EU dairy sector

Jack Peerlings, Nico Polman and Noortje Krol



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# Introduction

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- CAP reform: quota abolition and price reduction
- Characteristics milk market
  - Perishable product;
  - Relatively high transport cost fresh products.
- Two production regions:
  - Local demand;
  - Export.
- Price differences between regions: prices of fresh products can be higher in a region where production takes place for local demand.
- Attractive for processing industry or retail to support milk production if production tends to fall below local demand.

# Regions

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- Province of North-Holland: the Netherlands
  - Relatively large farms, land intensive, few processors, quotas are binding, export cheese.
- North East Scotland: UK
  - 70 farms left and number is declining fast, quotas are not binding, production for local market.
- South East Planning Region: Bulgaria
  - Many small farms plus some larger, only 20% of milk is processed, quotas are not binding.
- Centre: France
  - Diversified and extensive farms, many processors, quotas are binding, production of diversified products for local market.

# Model

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## ■ Determinants of structure:

- Personal characteristics (age, education, successor, etc.);
- Relative profitability of dairy farming (prices, policy);
- Growth in farm size (productivity growth, investment costs);
- Market size (policy determined (France), size local market).

## ■ Assumptions:

- There is an autonomic trend in the number of farms (negative rate). The actual number of farms is on or below this trend.
- Production per farm grows with a fixed rate but also depends on relative profitability.
- Total production equals the production per farm times the number of farms. Total production is variable (model I) or fixed (model II).

# Model I: production is variable

- Model I: Production can vary without restrictions. All milk produced is processed.
- Model I: production per farm grows with a fixed rate but also depends on relative profitability of dairy farming. The number of farms declines at a fixed rate. Both are independent:
  1.  $y_t = y_{t-1} \times (1+r) \times \text{Profit}_{\text{dairy}} / \text{Profit}_{\text{alternative}}$
  2.  $N_t = N_{t-1} \times (1+i)$
  3.  $Y_t = y_t \times N_t$

# Model II: production fixed

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- Model II with fixed production. There are two possibilities:
  1. First, total production is larger than the threshold. In that case total production has to go down. In the model this happens by means of an extra reduction in the number of farms. Production per farm remains unchanged.
  2. Second, total production falls below the threshold. In that case the number of farms is determined by the autonomic trend and production per farm has to go up. This happens by means of an increase in relative profitability: processors, retailers or government start subsidising milk production.

# Example

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A dairy policy reform lowers relative profitability. Production per farm goes down (although there can still be growth due to the productivity increase). Given that total production is fixed there are two possibilities. First, total production would still be larger than the threshold and the number of farms falls below the autonomic trend. Second, total production tends to fall below the threshold. This implies production per farm has to go up. This implies a subsidy is paid to the dairy farmers by processors, retailers or government.

# Governance

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- Model I assumes processors process all milk without a restriction if the total production changes.
- Model II assumes processors, retailers or government subsidise production or otherwise total production could fall below the threshold. If total production is larger than the threshold this has to be enforced (quota). Here we assume that if the number of farms goes down extra (total production tends to increase) this would typically be the situation with tradable quotas. An alternative would have been to lower profitability which seems relevant in case of non-tradable quotas.

# Interviews

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- In all four regions semi-structured interviews with stakeholders were held focussing on what would happen after quota abolition.

# Data + Scenarios

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- Using data from 2003 till 2007 the growth rate in production and decline in the number of farms was determined.
- Using 2007 as a base year a 10 year simulation was made and the outcomes of this simulation form the base scenario.
- Alternative scenario is a drop in relative profitability of 10% in 2008.
- North-Holland (the Netherlands): model I applies
- Centre (France): model II applies
- North East (Scotland): model II applies
- South East Planning region (Bulgaria): model I applies

# Results: North Holland

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- The number of farms is not affected by the drop in profitability (27.7%). Total production increases 15.1% in base scenario and 3.6% with the drop in profitability.
- The interviews show that indeed an increase in total milk production is to be expected. The government nor processors intend to take action to avoid this. If the increase in total milk production would be very large it could be that the government imposes restrictions because of environmental reasons.

# Results: Centre (France)

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- Without fixing total production it would increase with 0.3% in the base scenario and would fall with 9.7% with the drop in relative profitability. The number of farms would go down with 47.3%. Fixing total production therefore implies that relative profitability has to go up (with 11.1%). The drop in the number of farms is almost the same in that case (47.4%).
- The interviews indeed state that the France government tries to maintain regional production. The way this should be done is still discussed. It implies stimulating milk production in regions as Centre and limiting production in regions as Normandi.

# Results: South East Planning region (Bulgaria)

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- Total production falls in the base scenario with 5.0% and 14.5% with the drop in relative profitability. The number of farms falls with 75.6%. If Bulgaria wants to maintain the total production level of 2007 relative profitability has to increase with 5.3% in the base scenario and 17.0% in the alternative scenario.
- The interviews confirm that processors are in shortage of (high quality) milk. To secure the supply they provide technical assistance to dairy farmers (implicit subsidising). So model II seems to be relevant instead of model I.

# Results: North East Scotland

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- Fixing total production leads to a reduction in farm numbers of 38.0%. There is little difference between the base and alternative scenario. The reason is that without the fixed production total production would go up with 10.8% in the base scenario and 0.4% in the alternative scenario. Farm numbers go down in both scenarios with 31.3%. To prevent the increase in total production there is an extra drop in farm numbers.
- The results are in contrast of what was found in the interviews. Stakeholders stated there that retailers or processors would have to pay a subsidy to farmers in order to maintain total production at the same level. Good negotiation of the farmers?

# Caveats

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- Further research could be directed towards:
  - More explicitly modelling the factors that determine structural change.
  - Determining the size of the local market (now 2007 production for Centre, North East Scotland and South East Planning region).
  - Taking into account price volatility.

# Conclusions

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- The paper presents a simple empirical model that seems to mimic the expected developments in farm structure well (with the exception of Scotland?).
- Structural developments will differ within the EU depending on whether production is mainly for the local market or exported.
- In case production will be for the local market and total production falls below a threshold processors, retailers or government have to support regional milk production. Support could be either through payments or technical assistance.

# Thank you

# Questions...?

