Economic rationality of a quota system

Prepared for the meeting on:

Supply management and collective marketing in the dairy sector: Ensuring cost-effective prices and the continued existence of large numbers of family farms throughout the rural world

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The question:

- Quotas are deemed irrational by many economists
- Yet, others consider they can be extremely efficient and useful
- Depends upon how you look at it!
- Different points of view to be considered:
  - The elementary classroom vision
  - The egoïstic “domestic protection first” vision
  - A vision derived from the Theory of Chaotic Motion
  - Similarities with futures markets
The elementary class room vision

- With quotas, prices are not “optimal”: they create rents, for the benefit of producer, at the consumer expense.

On a competitive market, price equates marginal cost. At this point, any price increase causes more harm to consumer than benefits to producer. And *vice versa*.

*(consumer welfare in scarlet. Producer profit in turquoise)*
The elementary class room vision

With quotas, prices are not “optimal”: they create rents, for the benefit of producer, at the expense of consumer.

With quota setting production at level $Q_1$:
- Producer rent increases in deep blue
- Consumer losses in red + deep blue
- Producer losses in green

This is the OPEP vision of collective monopoly!
Is the elementary vision correct?

It would be so if prices could be optimal! Can agricultural prices be optimal (i.e. = long run marginal cost)?

Car prices are nearly optimal (and decreasing!)

Marginal cost of producing tomatoes (seasonally adjusted) cannot be multiplied by 3 in a few months
What happen on a free market when price risk is present?

- Producer equates price with the *certainty equivalent* of demand.
- Lower production.
- Creates *risk premium*.
- In average, same effect as quota!
- But fluctuations in addition (harmful for consumer!)
Why are agricultural prices so volatile on free markets?

**Because of the rigidity of demand:**

Elastic demand (luxury goods):
A change in supply does not change price very much

Rigid demand (food, commodities):
A small change in quantity induces large changes in price
Consequences of demand rigidity:

- Agricultural markets cannot be optimal
- The foundation of all agricultural policies
- For the long run benefit of consumer (helping farmers is needed only because without farmers, consumers could not survive anymore...)
- Therefore, evaluating quotas benefits cannot rest on the optimal market as reference benchmark...
- Then, another vision is purely domestically oriented.....
The egoistic “domestic first” vision

- Because price under quotas are attractive, at least corresponding quantities are produced
- Secures a minimal procurement to consumer
- Here is the basic benefit of quotas
  - Over price is just an insurance which can be paid in different ways:
    - Deficiency payments (insurance paid by taxpayer; = subsidies?)
    - Fixed domestic price (insurance paid by consumer; implies variable levies at border; = subsidies?)
- In any case, neighbors complain: trade is the problem!
The alleged perverse effect of quotas on trade

- If all domestic markets are operating under quotas, then, the international market is the residual market.
- Should not be a concern with “perfect markets”, for international price would be marginal cost (quotas + deficiency payment are not distortive, contrary to subsidies).
- But with a volatile supply, a narrow market is more easily perturbed than a wide one.
The narrow market argument

With random production, quotas destabilizing

"With" : quota fixed at Q=1000. Random production uniformly distributed between 990 and 1010. Surplus or deficit sold or acquired on a residual market with supply uniformly distributed between 101 and 99, demand curve slope=-0.5, intercept =100.

"without" : all production sold on market. Demand slope= -1/22, intercept =100.
The narrow market argument: Is that true?

- Would be true if supply perturbed with random shocks
- But is supply submitted to exogenous (random) or endogenous (built in) shocks?
- We need a roundabout to answer this question!
- The endogenous shock theory....
The endogenous fluctuation theory

- **The point of departure: the cobweb model**
  - Expectations lags create fluctuations
  - Converges (like a ball at the bottom of a cup) if demand elastic
  - Diverges (like a ball at the tip of a pencil) otherwise

- **The modern cobweb theory**
  - Instable equilibrium with inelastic demand
  - Repulsive equilibrium point
  - When price far from equilibrium, something (fear of risk, lack of money) takes it back toward equilibrium

- Generates apparently random price series
Apparently random price series generated by a cobweb mechanism

Nothing random in this series, from a chaotic cobweb with:
Demand: \( \alpha = -0.6, \beta = 10 \); supply: \( a = 0.35, b = 2 \); Risk aversion \( A = 0.05 \);
Constant expectations: \( P_t = 6 \); Variance estimated over two points;
Such chaotic series are quite different from random series

- It is much more difficult to get rid of chaotic (and market related) than from random fluctuations
  - While rain does not change when a region is irrigated, the forces underlying chaotic motion tend to react against corrections
  - Hence, the “law of large numbers” does not hold
- As an illustration: the infinite supply with price insured at mean equilibrium level....
Example of wicked market reaction: the consequences of guarantying price without limits

- Assume government knows the equilibrium price...
  - In a “random series” environment, insuring this price would be possible at no cost
  - In reality, because of the absence of risk, producer will increase supply over any limit...

- This is how “intelligent” market contradicts measures to correct it...

- How do quotas perform in this context?
The same series with and without quotas

Chaotic cobweb price, with and without quotas

Same parameters as before; In case of quota:
quota = equilibrium quantity * 0.9; guaranteed price = equilibrium price * 1.1
Quota price guaranteed through deficiency payments; Excess quantities sold on residual market at market price
Overall result of previous experiment:

<table>
<thead>
<tr>
<th></th>
<th>With quota</th>
<th>Without quota</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer surplus</td>
<td>20.7</td>
<td>18.5</td>
</tr>
<tr>
<td>Producer surplus</td>
<td>15.0</td>
<td>10.9</td>
</tr>
<tr>
<td>Government expenses</td>
<td>-3.3</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>32.4</td>
<td>29.4</td>
</tr>
</tbody>
</table>

Here, a quota is a “good thing”, by securing a minimum quantity despite market reactions.
In summary:

- The “narrow market” argument against quotas does not hold more than the “undue rent to producer” argument.
- On the contrary, a quota system could be the only really efficient system to catch up over endogenous fluctuations which are frequent in agriculture due to the rigidity of demand and the long production delays.
A last remark: the “futures market” vision of quotas

- Futures markets stand as the standard liberal recommendation to cope with price risk
  - They may provide a perfect price guaranty (not insurance), at the cost of a high risk premium
  - This is because speculators must be rewarded
- The case of quotas is similar, except that the State does not require any risk premium...
  - Consistent with K.J. Arrow’s claim that “the role of the State in a market economy is to bear risks that private operators cannot undertake.”
  - The difference between quotas and vertical integration...
In short:

- Quotas are “very bad” at the elementary classroom level.
- They can be “very good” at a post graduate level.
- They do not cost much to government.
- Is it not sufficient?

THE END
PFSA:
Gestion de l’offre et mise en marché collective dans la production laitière.

Risques généraux sur la gestion de l’offre
&
Rapports avec l’industrie

J-F. Sneessens
Plan

I. Introduction
  1/ Gestion de l’offre en agriculture (rappels généraux)
  2/ ocm Lait : fin 01.04.2015
  3/ Qu’appor tent les quotas laitiers ?
  4/ Deux niveaux de régulation (via les quotas laitiers)

II. Evolution au niveau du secteur

III. Evolution au niveau d’un transformateur

IV. Conclusions
I. Introduction

1. Gestion de l’offre en agriculture (Rappels généraux)

- **Pourquoi ?**
  - Offre très dispersée
  - Offre inélastique à court terme
  - Demande inélastique (+ obligation de sécurité alimentaire)

- **Prix** : Imprévisibilité, Volatilité, Dépression chronique

- **Gestion : à quelle échelle ?**
  - Nationale
  - [Internationale]

- **Δ+ actuelle prix mondiaux ?**
  - Libéralisation Politique Agric. ???
  - Δ- Inégalités !!!
2. **ocm Lait** : Fin 01.04.2015 (= fin des quotas laitiers ?)

3. **Qu’apportent les quotas laitiers?**
   - Quantité
   - Prix
   - Durée
   - Localisation (+ Environnement), etc.

   *Inconvénients* : (rigidité, …) !

4. **Deux niveaux de régulation** (via les quotas laitiers)
   - **Secteur** (marché des produits transformés; concurrence inter-firmes de transformation; relations Firmes-clients)
   - **Transformateur** (marché de la matière 1ère; concurrence inter-agriculteurs; relations commerciales Transf.-Agric.)
II. Evolution au niveau du secteur

(marché produits transformés, …)

• Suppression Quotas ⇒ suppression Gestion offre !,
sauf si Concentration secteur (maîtrise marché, …); NB: concurrence ?

• Inchangé : Contrainte de quantité globale (même à Export)

• Avantages (espérés):
  Croissance, compétitivité, localisation ?, souplesse, approvisionnement mat 1ᵉ, …

• Inconvénients :
  Pression sur prix produit final, moindre organisation marché
  (segmentation et prix), localisation ?
III. Evolution au niveau d’un **transformateur**  
(achat Mat. 1ᵉ, relations Transformateur/Agriculteurs, ….)

- **Suppression Quotas** ➔ ne supprime pas gestion offre pour mat.1ᵉ apportée par les agric. !
  
  (ce qui est nouveau, c’est que c’est le transformateur qui va tout organiser selon: débouchés produit final, économie de coût approv., …) ➔ **Contrats**

- **Contrats** : Q, P, durée, répartition, localisation,…

- **Avantages** (transformateur !):
  
  Pression sur prix mat 1ᵉ, partage marge + favorable, maîtrise condit. approvtd…

- **Inconvénients** (agric. !):
  
  P <, marge <, faible pouvoir marché (face à monopole,…),

- **Rôle**: - Filière : AI (Accords Interprofessionnels), … ?

  (NB : concurrence ?)

  - Coop. : … !!!
IV. CONCLUSIONS

• Système de quotas laitiers:
  *Garder un outil utile et important à long terme!*
  [⚠️ Suppression: ~ irréversible!; précédent dangereux pour autres systèmes de gestion de l’offre]

• Eventuellement assouplir – élargir cadre
  - $\Delta+$ quotas ?
  - ↓ Prélèvement sur excédents ?
  - ↑ Mobilité,… ?

• Au-delà de cela permettre :
  **AI** (Accords Interprofessionnels), filière,… > < Concurrence !
  Assurer des possibilités d’action pour les acteurs économiques petits, faibles et dispersés (J.K. Galbraith)