What’s in a Name?
Information, Heterogeneity, and Quality in a Theory of Nested Names

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AAWE Bordeaux - June 23, 2016
Introduction

Different quality labeling strategies used in food markets:

- **Private brands**: usually for processed products; national or individual brands.

- **Collective labels**, such as EU’s Geographical Indications (PDO/PGI): mainly in Southern-Europe. France, Greece, Italy, Portugal and Spain represent 80% of total PDO/PGI value sales.

- But also, **nested names**: individual brands nested within collective labels. Common in many sectors, such as
  - Wine sector,
  - Cheese sector,
  - Regional specific products: fruit & vegetables, tea, coffee, cocoa, ...
Questions addressed in this paper

- Can we explain the existence of these different situations?
- What are firms best strategies? More basically,
  - Why joining a collective label?
  - Why would the high-quality $H$ producers be willing to pool with low-quality $L$ ones and suffer from negative spillovers?
- Moreover,
  - How are different labeling schemes chosen? Under what conditions?
  - Are some labeling schemes more “conflict-prone” or are some better to take into account divergent interests among heterogeneous producers?
- What are their implications for quality investments? What are their welfare implications?
Issues we are interested in explaining

1. The coexistence of different labels: individual brands, collective labels, nested names.
2. Controversies regarding quality choices in collective labels...
...NOT only in wines... or in Italy...

**Les couteliers de Laguiole veulent une "indicator géographique" restreinte au village**

06 Juin 2015, 09h51 | MAJ : 06 Juin 2015, 09h51

Les couteliers de Laguiole (Aveyron) se réjouissent qu'une "indication géographique" puisse bientôt valoriser l'industrie et demandent que cette IG "couteau de Laguiole" soit restreinte à leur village, dans un rayon de 20 km autour, présidé (http://actualites.leparisien.fr/president.html) de leur syndicat.
3. Within-label differentiation.
4. **Secession** (e.g., Super Tuscans and Bolgheri)...
Evidence from the literature

• On the demand side, **information matters**:  
  • Labels convey quality signals and attract consumers’ WTP compared to no quality signal, and increase more the WTP for non-branded products (Bonnet & Simioni, 2001; Hassan & Monier, 2006).
  • PDOs mostly valued for products of average quality, not for higher quality: bovine meat cuts (Loureiro and McCluskey, 2006), wines (Costanigro et al., 2007).
  • Easier for average consumers to access collective names. Knowledgeable consumers value more firm-specific names (Costanigro et al., 2012).
  Evidence from experimental literature (Guastafson, 2015) and industry practices.
  • Collective reputation plays a role when individual quality is not observable (Tirole, 1996, Saak, 2010)

• On the supply side, **heterogeneity matters**:  
  • Producers differ in agro-climatic conditions or ability to provide quality (Zago, 2015). Evidence of free-riding problems within collective labels (Winfree and McCluskey, 2005; Fishman et al., 2015), and also in the literature of quality setting in cooperatives.
A simple setting

- **Consumers:**
  - Unit mass, and each one consumes at most one unit of product.
  - Preference $U = \theta s - p = s - p$, i.e., $\theta = 1$.
    - Homogeneous preferences for quality, but...
  - Heterogeneity in **awareness**: $\alpha$ can be informed of *individual* quality, while $1 - \alpha$ can only be informed about the *average* quality of the group.

- **Producers:**
  - Unit mass, and each provides at most one unit.
  - Heterogeneous in quality provision:
    - **H** commitment type: proportion $\beta$, produces quality $\delta$ at no cost;
    - **L** opportunistic type: proportion $1 - \beta$, produces $s \in [s_0, \delta)$ at cost $\Phi(s)$ ($\Phi' > 0, \Phi'' > 0$).
  - Other things equal, $\delta$ captures the degree of heterogeneity.
  - Different from other models, where typically one assumes $c_H < c_L$. 
Firms’ **labeling strategies** and relative effects are the following:

1. **Individual brand** (*I*):
   - can inform **aware consumers**, $\alpha$, about the **true quality** of a particular product;
   - w/out other labels, unaware consumers cannot be informed, so
   - **unaware** expect the **market average quality**, i.e., $\bar{s}_0 = \beta \delta + (1 - \beta) s_0$.

2. **Collective label** (*C*):
   - collective labels inform (aware & unaware) consumers on the group’s **average quality**;
   - the group decides on a **cahier des charges**, i.e., a quality standard $s_c \in [s_0, \delta]$;
   - the average perceived quality is $\bar{s}_c = \beta \delta + (1 - \beta) s_c$. 
Name patterns in the market:

1 **Uniform Collective label (UC):**
   - If all producers adopt UC, the perceived quality is the region’s average quality: $\bar{s}_c = \beta \delta + (1 - \beta)s_c$, with $\delta > \bar{s}_c > s_c \geq s_0$.
   - **L-types** benefit from UC because of:
     1. the positive spillovers they get from H in **both** markets,
     2. the stricter quality standard enforced in the group.
   - **H-types** benefit because they can reach the unaware market.

2 **Nested names (C + I):**
   - H types may develop their individual brand on top of C:
     - **aware** consumers recognize true quality, i.e., $\delta$ for H and $s_c$ for L,
     - **unaware** perceive only the average quality $\bar{s}_c$ for all products.
   - the positive spillovers are confined to the **unaware** market.

3 **Separated labels (CL, I):**
   - L types in the group (CL), H types out (with I).
   - Collective label informs **ALL** consumers of the true quality $s_c$.
   - H types suffer negative spillovers in **unaware** market from being commingled from spot market, i.e., $\bar{s}_0 = \beta \delta + (1 - \beta)s_0$. 
Other assumptions (heterogeneity & decisions):

- **Group’s decision rule**: simple majority rule.
  - *L* majority rule: assuming $\beta < \frac{1}{2}$, the quality scheme and quality level ($s_c$) is designed in the interest of the *L* type.

- **Timing** for decisions is the following:
  - **Stage 1**: Group (*L* majority) decides the **labeling scheme**, i.e., the scenario under which quality investments will be undertaken.
  - **Stage 2**: Group decides the **quality standard/ investment** $s_c$, i.e., it defines the **code of practice**.
  - **Stage 3**: Producers decide the **price** to be charged to consumers. Consumers decide whether to buy or not.

\[ t = 1 \quad \underline{2} \quad 3 \]

- Labeling
- Quality
- Pricing
Perfect price discrimination, $L$’s majority rule

- With perfect PD $\rightarrow$ **prices** charged up to max WTP for both aware and unaware consumers. $\rightarrow$ Producers are **monopolists**.
- In the $2^{nd}$ stage, $L$-group chooses $s_c$ (**quality standard**),
  - in each of the possible labeling schemes ("UC", "C + I", "$C_L, I$"),
  - taking into account that $H$ can deviate from the chosen scheme.
- We start from the grand coalition with an available regional name.
- We assume NO collective deviation (coordination) and check for **unilateral deviations** in a case-by-case fashion.
- Best **outside option** for $H$ is that in $C + I$, because in the unaware market she is confused with group, not the spot market, and $s_c \geq s_0$. 
1: Uniform Collective label (UC)

- The problem for the L’s majority is (spillovers in whole market):

\[
\max_{s_c} \pi^\text{UC}_L(s_c) = \bar{s}_c - \Phi(s_c) = \beta \delta + (1 - \beta)s_c - \Phi(s_c)
\]

\[
\text{s.t. } \pi^\text{UC}_H(s_c) = \bar{s}_c \geq \pi^\text{C+1}_H(s_c) = \alpha \delta + (1 - \alpha)\bar{s}_c - f
\]

Lemma 1

With UC, the L-majority chooses the quality standard \( s^U \), which solves \((1 - \beta) = \Phi'(s_c)\), if and only if the following inequality holds:

\[
\delta < \hat{\delta} \equiv \frac{f}{\alpha(1 - \beta)} + s^U. \quad (1)
\]

Otherwise, the standard is set at \( \hat{s}^U(\delta, \alpha, \beta) = \delta - \frac{f}{\alpha(1 - \beta)} > s^U \).

- We first assume that eq. (1) holds and \( s_c = s^U \).
2: Collective label nested with individual brand \((C + I)\)

- Problem for \(L\) majority (spillover only in \textit{unaware} market):

\[
\max_{s_c} \pi^{C+I}_L(s_c) = \alpha s_c + (1 - \alpha) \bar{s}_c - \Phi(s_c)
\]

with \(\bar{s}_c = \beta \delta + (1 - \beta) s_c\).

- The participation constraint for \(H\) is trivially satisfied.

- Solution \(s^N\) solves:

\[
s^N : (1 - \beta + \alpha \beta) = \Phi'
\]
3: Collective label separated from Individual brand \((C_L, I)\)

- **No spillovers**: label formed only by \(L\) group \(\rightarrow\) true quality \(s_c\) revealed to all consumers. Problem for the \(L\) group is now:

\[
\max_{s_c} \pi_{C_L, I}^L(s_c) = s_c - \Phi(s_c)
\]

- The solution is \(s^*\):

\[
1 = \Phi'.
\]

- \(\Rightarrow\) Full information for \(L\) group, so that the *quality standard* achieves the first best (FB) level because *NO spillovers*.

- Separating from collective label, \(H\) cannot reach unaware consumers with its true quality. So it receives the price of the common lemon market \(\bar{s}_0\). \(\rightarrow\) \(\pi_{H, I}^{C_L} = \alpha \delta + (1 - \alpha) \bar{s}_0 - f\).
Result 1. Equilibrium in the **unconstrained** case

**Proposition 1**

Based on the $L$ majority rule, if $\delta < \hat{\delta}$ (constraint (1) is NOT binding), we have

- $\pi^{UC}_L > \pi^N_L > \pi^*_L$.
- $\pi^N_H > \pi^C_H > \pi^{CL, I}_H$.
- $s^U < s^N < s^*$.

Therefore,

- The quality standard is lowest under $UC$, highest with separate names.
- The $L$ group will choose the Collective label.
- The $H$ type would be strictly better off under nested names.
Choice of labeling scheme

LQ’s profits

UC - Full spillovers

\[ \Phi' \]

\[ \beta \]

\[ 1 \]

\[ 1 - \beta + \alpha \beta \]

\[ 1 - \beta \]

\[ 1/2 \]

\[ \beta \]

\[ 0 \]

\[ UC \]

\[ C + I \]

\[ C_L, I \]

\[ \delta \]

\[ s^U \]

\[ s^N \]

\[ s^* \]
Nested - Partial spillovers

\[ \Phi' = \frac{1}{\beta} \left( 1 - \beta + \alpha \beta \right) \]

\[ 0 \leq \beta \leq 1 \]

\[ 0 \leq s \leq \delta \]

\[ UC, C + I, C_L, I, s^U, s^N, s^* \]
Choice of labeling scheme

LQ’s profits

Separated - No spillovers

\[ \Phi' \]

\[ \beta \]

\[ 1 \]

\[ 1 - \beta + \alpha \beta \]

\[ 1 - \beta \]

\[ 1/2 \]

\[ \beta \]

\[ 0 \]

\[ UC \]

\[ C + I \]

\[ C_L, I \]

\[ \delta \]

\[ s^U \]

\[ s^N \]

\[ s^* \]

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What’s in a (nested) name?

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Result II. Constrained problem: “UC” or Nested?

Proposition 2

Under $L$ majority rule and perfect PD, the $L$ producer group trades-off between the uniform collective label and the nested names. There exists $\delta^{NU}$, which solves $\pi^U_L(\hat{s}^U(\delta, \alpha, \beta)) = \pi^N_L$ for $\delta$, such that $\delta^{NU} > \hat{\delta}$

- if $\delta < \hat{\delta}$, uniform collective label is adopted with the standard $s_c = s^U$.
- if $\hat{\delta} < \delta < \delta^{NU}$, uniform collective label is adopted with the standard $\hat{s}^U > s^U$.
- if $\delta^{NU} < \delta$, the nested names are chosen with standard $s^N$, with $s^N < \hat{s}^U$. 
Equilibrium labeling schemes

Equilibrium labeling schemes

Nested “C_{L+I}” (S^N)

High heterogeneity

Constrained “UC” (\hat{S}^\hat{U})

Medium heterogeneity

Unconstrained “UC” (S^U)

Low heterogeneity

Information

\( \delta \)

\( \delta_{NU} \)

Heterogeneity of firms

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Interesting insights

- Intuition. *UC* enables *L* types to benefit from max spillovers. However, sometimes *L*’s majority may need to balance interests of *H* types as well, either by increasing $s_c$ or allowing nested labels. When
  - producer heterogeneity is high ($\delta$ is large), it is too costly for *L*’s majority to increase quality to keep *H* in the group; and/or
  - there are more informed consumers ($\alpha$ is large), there are lower incentives for *H* to stay in the group (fewer unaware), but then *L* may have lower incentives to produce quality,

then the *L*’s group switches to nested labeling.

⇒ Nested names when $\uparrow$ heterogeneity and/or consumers’ awareness.

- In the literature, differentiation to attract consumers with heterogeneous tastes or to soften competition. Here, no heterogeneity in preferences and no competition ⇒ labeling differentiation to balance divergent interests within the group.

- Notice however that nested names may reduce welfare.
Result III. Welfare analysis: Better Collective or Nested?

Proposition 3

The choice of the L’s majority can be welfare deteriorating or welfare enhancing.

There exists \( \delta^W \), which solves \( W^{UC}(\hat{s}^U(\delta, \alpha, \beta)) = W^{C+I}(s^N) \), such that \( \delta^W < \delta^{NU} \) and:

- if \( \delta < \delta^W \), \( L \) chooses “\( UC \)”, entailing a lower welfare than the nested label, i.e., \( W^{UC} < W^{C+I} \);
- if \( \delta^W \leq \delta < \delta^{NU} \), \( L \) chooses “\( UC \)”, resulting in a higher welfare level than the nested labels, i.e., \( W^{UC} > W^{C+I} \);
- if \( \delta \geq \delta^{NU} \), then \( L \) chooses “\( C + I \)”, entailing a lower welfare than the uniform labels, i.e., \( W^{C+I} < W^{UC} \) (constrained).
Welfare analysis
Better Collective or Nested?

What's in a (nested) name?

Nested "C_l+I" (s^N)

W_{UC} > W^N

Constrained "UC" (s^U)

W_{UC} < W^N

Unconstrained "UC" (s^U)
1. Nested names enable $H$ types to differentiate themselves. Usually, this is good. However, quality incentives for the opportunistic types depend on 2 mechanisms:
   - spillovers: $\downarrow$ with nested, $\rightarrow \uparrow s_c$ and $s^N > s^U$;
   - desire to retain $H$ in the group (PC): with constrained $UC$, $s^U > s^N$.
   When this latter effect dominates, $UC$ welfare dominates nested names.

2. In the literature, better informed consumers may induce higher quality incentives for firms.
   Here, more aware consumers with possible negative externality effect: ($\Delta$ of labeling choice) $\rightarrow$ switch to nested names $\rightarrow$ possible welfare reduction.
What if **PD is NOT doable?**

- Trade-off in the pricing stage, when choosing between serving
  - the whole market at low price, or
  - part of the market at higher price.
- For the $H$ type, with nested names trade-off between
  - targeting only aware consumers ($\alpha$) at a high price $\delta$ with $I$, or
  - targeting the entire market at a lower (average) price $\bar{s}$ ($\bar{s}_c$ with $C + I$ or $\bar{s}_0$ with $C_L, I$).
- For the $L$ type, trade-off between
  - targeting only unaware consumers $(1 - \alpha)$ at an average price $\bar{s}_c$ with nested names, or
  - targeting the entire market at a lower price reflecting its true quality $s_c$. 
Result IV. Equilibrium labeling scheme w/out PD
Robustness checks

- We have used a simple majority’s rule, when in reality there may be other decision rules which may depend on the political power of producers with different interests. As long as $L$ producers have the dominant power, our results will be unchanged.

- $H$ types could be the majority of producers in a region. They would form a group $C_H$, setting a standard $s_c = \delta$, informing ALL consumers. However, such a situation is less common (and interesting).

- Another is the case of sub-group collective label(s) nested within the grand collective label, i.e., $C + C_H$. The most terroir-oriented is Burgundy, imitated elsewhere in the world. Analysis is easily extended and similar to $C + I$, since $L$ can still benefit from $H$ in the unaware market, thanks to the common $C$. 
Concluding remarks

• We rationalize the existence of collective labels and nested names, arguing that they could provide differential information to consumers.

• We take into account producers’ heterogeneity, to explain choices.

• We can then explain the emergence of different labeling schemes: from collective labels to nested names, depending on producers’ heterogeneity and consumers’ awareness.

• For industry, easy “prediction”:
  • stick together in unknown markets,
  • differentiate in knowledgeable markets.

• Policy recommendations trickier: nested names accommodate heterogeneity, but may lead to a decrease in quality and welfare.

• Further work, extensions by relaxing simplifying assumptions.