Collective Reputation in Online Platforms and Private Quality Standards

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Overview

1. Introduction

2. Literature Review

3. Model

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The Issue

- Food is increasingly sold online
- Quality is a concern with food, especially online
- Individual sellers may not have the incentive to produce high quality
- Platform fees may impact these incentives
- Solutions may include quality standards or traceability
The Issue - Examples

- Amazon and Whole Foods - Vertical Integration
- Alibaba
- Ebay
China's fake food problem: Soy sauce and spice mixes

by Serenitie Wang and James Griffiths  @CNNMoney

January 18, 2017: 10:05 PM ET

Why Chinese food safety is so bad

By Katie Hunt, CNN

Updated 2:53 AM ET, Fri January 16, 2015

Furious shoppers say Whole Foods' produce has turned 'depressing,' 'barren,' and 'bone-dry' — and they blame Amazon
Literature Review

- Asymmetric Information
- Collective Reputation
- Online Reputation
Literature Review - Potential solutions

- Quality standards
- Traceability
- Punishments
- Integration
Model

- $N$ firms sell on one online platform
- Quality is endogenous
- Consumers expect an average quality, which impacts demand
- Online platform charges a fee
Model

Reputation:

\[ R_i = \gamma k_i + (1 - \gamma) \frac{\sum_{j=1}^{N} q_j k_j}{Q} \]

Demand:

\[ p_i = a + \theta R_i - bQ \]
Model

Each firm’s cost function:

\[ c(q_i, k_i) = q_i k_i^2 \]

Firm’s objective function:

\[ \pi_i = q_i \left( a + \theta R_i - bQ - k_i^2 \right) - F(q_i, p_i) \]
Type of fees

1. fixed fee

\[ \frac{\partial F}{\partial q_i} = \frac{\partial F}{\partial p_i} = 0 \]

2. per unit fee

\[ F(q_i, p_i) = fq_i \]

3. revenue percentage fee

\[ F(q_i, p_i) = \phi q_i p_i \]
Socially optimal quality:

\[ k^\dagger = \frac{\theta}{2} \]

Socially optimal quantity:

\[ q^\dagger = \frac{4a + \theta^2}{4Nb} \]
Model

- First, optimize the seller’s problem
- Second, optimize platform fees
- Find equilibria
Model - fixed fees

- Fixed fees do not exacerbate the quality problem
- A way to extract profits from sellers to the online platform
- The online platform has an incentive to have few sellers
Model - per unit fee

- Fixed fees do not change the quality problem
- This causes an output restriction
Model - percentage of revenue fee

- If platforms charge a percentage of revenue, quality gets worse
- This causes an output restriction
Model - potential solutions

- Minimum quality standards
  \[ \bar{k} = \frac{\theta}{2} \]
- Traceability
  \[ \gamma = 1 \]
- Warranties
Conclusions

- Online sellers have an incentive to sell low quality food
- Platform fees may exacerbate market power
- Platform fees could potentially make the quality problem worse
- Possible solutions are standards or traceability