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# Collective Reputation in Online Platforms and Private Quality Standards

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# Overview

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# The Issue

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- 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

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- Amazon and Whole Foods - Vertical Integration
- Alibaba
- Ebay

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## China's fake food problem: Soy sauce and spice mixes

by Serenitie Wang and James Griffiths @CNNMoney

🕒 January 18, 2017: 10:05 PM ET

👍 Recommend 6.5K



## 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

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- Asymmetric Information
- Collective Reputation
- Online Reputation

# Literature Review - Potential solutions

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- Quality standards
- Traceability
- Punishments
- Integration

# Model

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



# Model

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Reputation:

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

Demand:

$$p_i = a + \theta R_i - bQ$$

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Each firm's cost function:

$$c(q_i, k_i) = q_i k_i^2$$

Firm's objective function:

$$\pi_i = q_i (a + \theta R_i - bQ - k_i^2) - F(q_i, p_i)$$

# Type of fees

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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

$$F(q_i, p_i) = \phi q_i p_i$$

# Model - socially optimal outcomes

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Socially optimal quality:

$$k^\dagger = \frac{\theta}{2}$$

Socially optimal quantity:

$$q^\dagger = \frac{4a + \theta^2}{4Nb}$$

# Model

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- First, optimize the seller's problem
- Second, optimize platform fees
- Find equilibria

# Model - fixed fees

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- 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

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- Fixed fees do not change the quality problem
- This causes an output restriction

# Model - percentage of revenue fee

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



# Model - potential solutions

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- Minimum quality standards

$$\bar{k} = \frac{\theta}{2}$$

- Traceability

$$\gamma = 1$$

- Warranties

# Conclusions

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- 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