

The "Free Rider" Problem in the Construction of Geographical Indications for Agricultural Products: A Case Study of Dangshan Yellow Peach in Anhui Province

Yifei Yuan

School of economics, Anhui University of Finance and Economics, Bengbu, Anhui, 233030, China

yuanyifei0129@163.com

Abstract

In the context of the rural revitalization strategy, the construction of geographical indications for agricultural products is of great significance, but the phenomenon of "free riding" is frequent. In this paper, literature analysis, SWOT analysis, PEST analysis, case analysis and other methods were comprehensively used to study Dangshan yellow peach in Anhui Province as an example. The study found that although the Dangshan yellow peach industry has the advantages of high quality and good climate, it has certain problems in brand protection, organizational structure, human resources, finance, etc., and is facing the challenges of fierce competition and consumption upgrading. In view of these problems, this paper proposes multi-party cooperation measures such as improving the blockchain traceability supervision system, optimizing production standards and innovative publicity to enhance brand competitiveness, strengthening government support for enterprise self-discipline and promoting consumer participation, so as to provide theoretical and practical reference for the governance of Dangshan yellow peach industry and other geographical indication products and the realization of upgrading and development, which is of great significance for ensuring the high-quality development of agricultural economy.

Keywords

Geographical indications for agricultural products, Dangshan yellow peach, Hitchhike, brand protection, Industrial development.

1. Introduction

In the context of implementing the rural revitalization strategy and promoting the high-quality development of agriculture, the geographical indication (GI) of agricultural products has become an important driving force to increase farmers' income and stimulate local economic development. With its unique regional characteristics and high-quality product attributes, GI products have attracted much attention in the market, and the market potential has been released, becoming a bright spot in regional economic development. However, the phenomenon of "free riding" has also emerged, with some enterprises or farmers taking advantage of the credibility of GI brands and taking advantage of information asymmetry to reduce product quality or sell counterfeit and shoddy goods for personal gain. This behavior not only disrupts the market order, but also makes GI agricultural products face a severe test of weakening consumer trust.

As a national geographical indication protected product, Anhui Dangshan yellow peach has a long history of cultivation and occupies a pillar position in the local agricultural industry. Thanks to the superior natural environment of Dangshan, the yellow peaches produced are of high quality, delicious and juicy, and have significant advantages in the field of canned food

processing, which have made great contributions to the local economic development for a long time. However, in recent years, the phenomenon of "free riding" has been rampant, a large number of inferior products have flooded the market, and the geographical indication of Dangshan yellow peach has been fraudulently used, resulting in a dusty brand reputation and a decline in market share, which has seriously hindered the healthy development of the industry, and urgently needs in-depth research and effective governance.

2. Theoretical framework and literature review

2.1. Theoretical framework

At present, the research on the phenomenon of "free riding" in the field of geographical indications of agricultural products is mainly analyzed by relevant scholars using the theory of information asymmetry and the theory of reputation mechanism. The information asymmetry theory originated from George A. Akerlof^[1], who took the used car market as an entry point and found that sellers have a comprehensive grasp of vehicle quality information, while buyers are difficult to accurately judge due to their lack of professional knowledge and testing methods. This information asymmetry leads to buyers tending to lower prices, and high-quality second-hand car sellers withdraw from the market because they cannot get a reasonable price. Michael Spence^[2] and Joseph E. Stiglitz^[3] improved the theory of information asymmetry, and put forward the theory of signal transmission and signal discrimination, which further improved the theory of signal asymmetry. For Dangshan yellow peach, under the framework of information asymmetry theory, the information gap between consumers and producers is significant in the complex agricultural product market environment. Therefore, due to the limitations of professional knowledge, testing methods and production information access channels, it is difficult for consumers to accurately distinguish the authenticity of product quality and source. For example, Chunyan Li and others^[4] pointed out that some unscrupulous producers take advantage of this gap to hide product defects, falsely label information, and sell shoddy products or fake products, which not only infringes on the rights and interests of consumers, but also weakens the reputation of GI brands, disrupts fair competition in the market, and obtains improper benefits.

The reputation mechanism theory was first proposed by Fama^[5], and on this basis, Holmstrom^[6] further elaborated Fama's ideas through the model and rigorously proved it, and established the agent market-reputation model. It can be seen that the brand reputation of geographical indications is a public asset of long-term collaborative efforts of producers in the region, and has significant positive externalities. Nocke Volker^[7] also mentioned that high-quality products and honest business practices accumulate brand reputation, enhance the overall market value, and benefit producers in the region. However, "free-riding" behavior leads to negative externalities, and inferior products enter the market on the free ride of brand reputation, diverting profits from genuine products in the short term, and destroying consumer trust in the long term, triggering adverse market selection. Due to the difficulty in distinguishing the quality of products, consumers tend to reduce their willingness to buy or choose low-priced and inferior products, resulting in "bad money driving out good money", squeezing the living space of high-quality and genuine producers, damaging brand reputation, and falling into a vicious circle of industrial development, which seriously threatens the sustainability of the GI agricultural product industry.

2.2. Literature review

Internationally, Winfree and McCluskey^[8] emphasize the integration of the rule of law and digital technology as the core strategy for GI protection. Improve laws and regulations, clarify the boundaries of rights and obligations, and severely punish infringements; Digital technology

empowers product certification, monitoring and traceability, improves protection efficiency, provides universal guidance for the practice of international GI product protection, and strengthens the global trend of collaborative innovation in the rule of law and technology for GI protection. Kim and Loury^[9] deeply analyzed the long-term harm of brand reputation damage to the regional economy, warned that if the "free rider" problem is not cured, it will destroy the industrial ecology and weaken the momentum of regional economic growth.

Although the research at home and abroad has yielded fruitful results in the root causes and coping strategies of the "free rider" problem, the systematic and in-depth research on specific GI products, such as Dangshan yellow peach, needs to be expanded. In particular, there is room for deepening research in combining regional industrial characteristics, cultural background and market environment to construct a precise and effective governance model, which provides innovative opportunities and exploration directions for this research.

3. Analysis of the current situation

3.1. Basic Information

Dangshan yellow peach planting scale is huge, the planting area is increasing year by year, and has become one of the important yellow peach producing areas in the country, with an annual output in the forefront. The fruit is known for its excellent quality, rich in vitamin C, dietary fiber and other nutrients, unique taste, is a high-quality raw material for canned processing, has a strong demand in the food processing industry, and the sales network covers the whole country and expands to the international market, injecting strong impetus into the local economic development. However, in recent years, the market has been chaotic, and a large number of counterfeit Dangshan yellow peach geographical indication products have emerged, flooding e-commerce platforms and farmers' markets, which are of inferior quality and poor taste, seriously misleading consumers, damaging brand reputation, disrupting the normal order of the market, weakening the competitiveness of the industrial market, making genuine sales face huge challenges, and the development of the industry is in trouble.

3.2. Competitor Analysis

The domestic yellow peach industry is fiercely competitive, and emerging yellow peach brands in Shandong and other places have sprung up. With modern planting technology and fine management, the emerging yellow peach producing area strictly controls the product quality, and the fruit quality is stable and the specifications are unified, which has significant advantages in the high-end fresh food market. At the same time, it adopts a diversified marketing strategy, with the help of e-commerce live broadcast, social media, offline tasting and other channels, accurately locates consumer groups, efficiently disseminates brand culture and product advantages, rapidly enhances brand awareness and market share, seizes the traditional market share of Dangshan yellow peach, forms strong competitive pressure on Dangshan yellow peach industry, forces Dangshan yellow peach industry to accelerate transformation and upgrading, innovate development models and competitive strategies, enhance the comprehensive competitiveness of the industry, and reshape the market dominant position.

4. The analysis of the external environment

4.1. SWOT Analysis

Dangshan yellow peach industry has significant advantages, thanks to Dangshan's unique soil and climatic conditions, the fruit color is golden, the flesh is firm, the sweetness is suitable, after long-term market inspection, the national geographical indication certification, the brand recognition is high, in the canned food processing and fresh food market has a stable consumer

group, for the development of the industry to lay a solid quality and market foundation. The regional climate is stable, with four distinct seasons, sufficient sunshine and moderate precipitation, which meets the needs of the yellow peach growth cycle and has a stable annual output, which provides strong support for the expansion of industrial scale and the stability of market supply, and reduces the risk of production and supply.

However, the disadvantages of the industry should not be overlooked. The brand protection mechanism is full of loopholes, the supervision of the use of geographical indications is lax, and the market access review is not strict, resulting in counterfeit and shoddy products taking advantage of opportunities, seriously damaging the brand image and market reputation, eroding the market share of genuine products, increasing the cost and risk of consumer purchase, and becoming a bottleneck for industrial development. The proliferation of counterfeit and shoddy products has caused a crisis of consumer trust, and the mixed market makes it difficult for consumers to distinguish the authenticity from the fake, frustrates their purchase confidence, reduces brand loyalty, inhibits the release of market demand, and threatens the foundation of industrial survival.

In terms of development opportunities, national policies strongly support the protection of geographical indications of agricultural products and the strategy of rural revitalization, and special subsidies, technology promotion, and brand cultivation policies have been intensively introduced to provide policy dividends and financial support for the optimization and upgrading of Dangshan yellow peach industry, help industrial technology innovation, quality improvement and brand building, and expand the space and potential of industrial development. With the vigorous development of digital technology, blockchain, big data, and Internet of Things technologies have penetrated deeply in the agricultural field, creating technical feasibility for building a digital traceability system for yellow peach products, realizing accurate control of the whole chain of information from the field to the table, enhancing the transparency and credibility of product quality, enhancing brand competitiveness, and empowering the digital transformation of the industry.

But the industry also faces many threats. With the fierce market competition, emerging yellow peach producing areas and brands in China continue to emerge, grabbing market share with differentiated positioning, efficient marketing and quality innovation, intensifying market competition, compressing the market space of Dangshan yellow peach, accelerating the upgrading and transformation of the industry, and enhancing the core competitiveness to cope with challenges. Consumers' expectations for the quality of agricultural products continue to rise, green, organic and safe have become the key demands of consumption, and the requirements for pesticide residues and quality stability are strict.

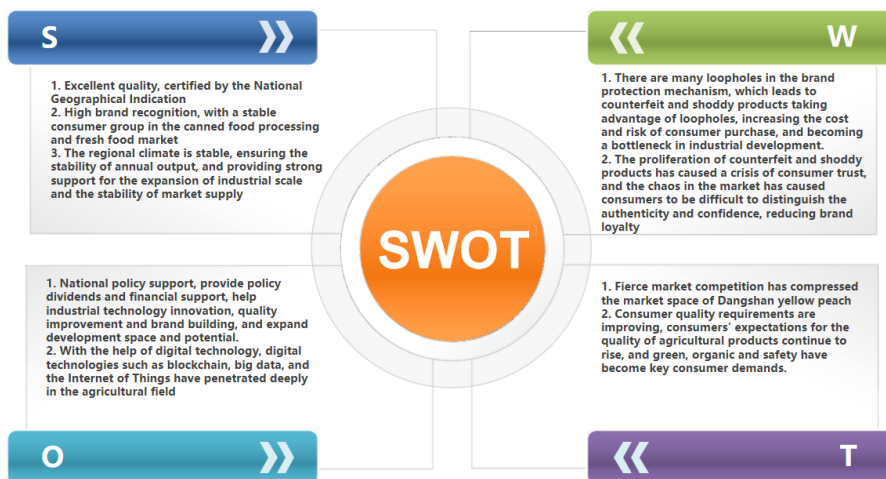


Figure 1: SWOT analysis chart

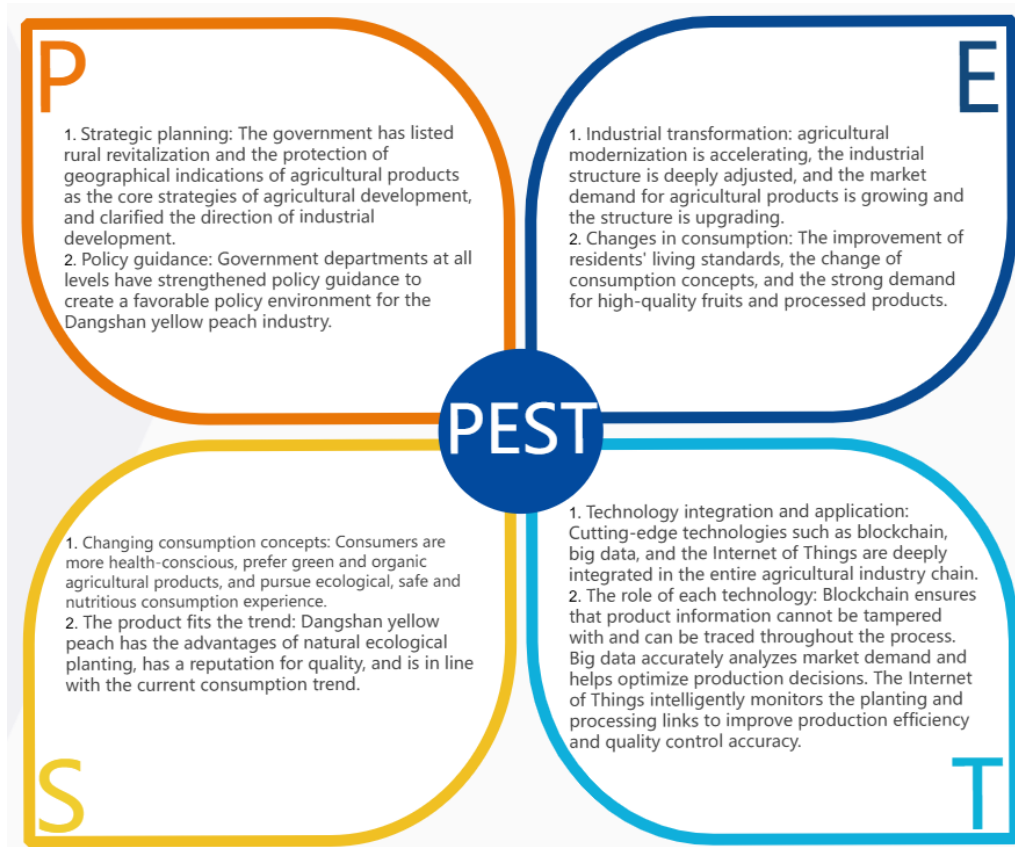


Figure 2: PEST analysis chart

4.2. PEST analysis

At the level of political environment, the government has listed rural revitalization and the protection of geographical indications of agricultural products as the core strategies of agricultural development, and government departments at all levels have strengthened policy guidance and resource allocation. The Ministry of Agriculture and Rural Affairs and the Ministry of Finance jointly promote the implementation of the project for the protection of agricultural products with geographical indications, increase capital investment, technical guidance and brand promotion, optimize the industrial policy environment, in order to enhance the strategic position of Dangshan yellow peach industry, stimulate the vitality and innovation power of industrial development, and ensure the sustainability and stability of industrial policy support.

In the economic environment, the process of agricultural modernization has accelerated, the structure of agricultural industry has been deeply adjusted, and the market demand for agricultural products has grown steadily and the structure has been upgraded. With the improvement of residents' living standards and the change of consumption concepts, there is a strong demand for high-quality fruits and their processed products, which creates a broad market space for the Dangshan yellow peach industry to expand sales channels, extend the industrial chain, and enhance the added value of products, drive the large-scale and intensive development of the industry, and promote the improvement of industrial economic efficiency and efficiency growth.

In the social and environmental dimension, consumers' health awareness is awakened, their preference for green and organic agricultural products is enhanced, and they pursue ecological, safe and nutritious food consumption experience. With the advantages of natural ecological planting and quality reputation, Dangshan Yellow Peach is in line with the trend of social consumption, which is conducive to expanding consumer groups, cultivating loyal customers,

enhancing the social recognition and market reputation of the brand with the help of green consumption trends, and enhancing the cultural connotation and social value of the brand.

In terms of technical environment, cutting-edge technologies such as blockchain, big data, and the Internet of Things are deeply integrated and applied in the entire agricultural industry chain. Blockchain ensures that product information cannot be tampered with and can be traced throughout the process; Big data accurately analyzes market demand and optimizes production decisions; The Internet of Things intelligently monitors the planting and processing links to improve production efficiency and quality control accuracy. Technological innovation empowers the Dangshan yellow peach industry, drives industrial transformation and upgrading, enhances the core competitiveness and sustainable development of the industry, and reshapes the industrial development ecology and competition pattern.

5. Analysis of the internal environment

5.1. Organizational Structure

The organizational structure of Dangshan yellow peach industry is based on the decentralized planting of farmers and the collaborative operation of cooperatives, and the hierarchical structure is simple. As the basic unit of production, the scale of operation of rural households is relatively small and scattered, and the production decision-making is independent but the coordination is weak. Cooperatives play a role as a bridge in the industry, integrate some rural household resources, and carry out technical training, agricultural material procurement and product sales services, but the internal division of functions is vague, the department setting is simple, and the lack of refined management structure. The connection between planting, processing and sales is not smooth, and the information transmission is sluggish and distorted, which makes it difficult for quality control to run through the whole industrial chain, the degree of product standardization is low, and the quality is uneven, which affects the overall image and market competitiveness of the brand, and it is difficult to adapt to the modern market's demand for consistency and stability of agricultural product quality.

5.2. Human Resources

Front-line farmers have accumulated rich planting experience, but they generally lack modern agricultural management knowledge and skills, and have limited knowledge of green planting technology, scientific pest control, and precision agriculture management, which restricts the improvement of production efficiency and quality. The shortcomings of brand marketing and market operation capabilities are prominent, and it is difficult to accurately grasp market dynamics, effectively expand sales channels and enhance brand value. Cooperatives and enterprise managers focus more on production management, weak awareness of brand strategic planning, lack of market expansion and brand building capabilities, lack of professional strategies and innovative thinking in brand positioning, image design, publicity and promotion, and are difficult to cope with fierce market competition, which restricts the development process of industrial branding and high-end, and hinders the realization of industrial value maximization.

5.3. Financial Situation

The yellow peach planting industry has achieved significant economic benefits and has become an important source of income for local farmers. However, counterfeit and shoddy products are flooding the market, which has seriously impacted the sales price and sales of genuine products. At the same time, due to the high cost of brand maintenance, the market share is squeezed, and the profit margin is compressed, which affects the industrial reinvestment and technological innovation capabilities. As a result, the shortage of funds restricts the introduction of high-quality seedlings, the purchase of advanced equipment and the promotion and application of

green technology, which weakens the stamina of industrial development. Financial difficulties hinder the pace of industrial structure upgrading and quality improvement, endanger the long-term profitability and sustainable development of the industry, and it is urgent to optimize the financial situation, strengthen brand protection and market governance.

6. Suggestions

6.1. Organizational Structure

In today's agricultural product market environment, building a unified and efficient traceability system has become a key link to prevent "free riding" behavior. By integrating the entire process data from planting to sales, and the complete data of yellow peaches from planting to sales, we can use the characteristics of blockchain technology that cannot be tampered with and leave traces in the whole process to give each product a unique number identity, so as to realize the whole process of real-time information upload, query and traceability. Consumers can scan or query the platform to know the origin of the product, the producer, the fertilization and medication, the test report and the later trajectory, so as to ensure the traceability of the source of the product, ensure the quality of the product, the responsibility to the person, improve the transparency of the market and consumer trust, so as to effectively prevent counterfeit and shoddy products from entering the market and strengthen brand protection.

In terms of law, an independent law enforcement agency for GI agricultural products can be established to strengthen the operational capacity of law enforcement personnel and promote the precision and efficiency of law enforcement. In the implementation of the law, it is necessary to intensify law enforcement, strengthen the professional ability of law enforcement personnel, improve the accuracy of law enforcement, and enhance the efficiency of law enforcement. In terms of laws and regulations, it is necessary to improve the relevant laws and regulations on the protection of geographical indications, increase the standards for punishing counterfeiting and shoddy acts, reasonably assess the cost of illegal acts, and refine the punishment measures and legal liabilities. At the same time, strengthen cross-regional law enforcement cooperation, jointly carry out special rectification with market supervision, public security, agriculture and other departments, break the geographical restrictions of law enforcement, and form a joint force to purify the market environment and safeguard the legitimate rights and interests of Dangshan yellow peach brand and market order.

6.2. Enhance brand competitiveness

First, the production standard system can be optimized, and strict production standards covering the whole chain of soil improvement, seedling breeding, planting technology, pest control, picking timing, and processing technology can be formulated according to international advanced agricultural standards and consumer quality needs. Introduce green and ecological planting technology and quality management system certification, standardize the production behavior of farmers and enterprises, ensure product quality consistency, stability and safety, and enhance product quality competitiveness. Strengthen the quality monitoring of the production process, use the Internet of Things and big data technology to achieve intelligent monitoring and early warning, correct deviations in a timely manner, ensure that the products meet high quality standards, and create a high-quality brand image of Dangshan Yellow Peach. Second, we can innovate the way of brand promotion, by excavating the history and culture, regional characteristics and planting inheritance stories of Dangshan yellow peach, shaping the brand characteristics, innovating the brand publicity method, and further excavating the brand image. Through short video production, live streaming, and online interactive marketing activities, and with the help of the diversified communication advantages of new media platforms, the growth environment, planting process, quality characteristics, and creative

eating methods of Dangshan yellow peaches are displayed in a panoramic manner, so as to enhance the interest and affinity of the brand, and improve consumers' participation and awareness. Create immersive marketing scenarios, strengthen brand memory and identity, broaden the dimension and depth of communication, and combine offline agricultural exhibitions, picking festivals, and cultural tourism activities to comprehensively enhance the brand's market influence and reputation.

6.3. Promote multi-party cooperation

The government plays a key role in guiding and supporting multi-party cooperation, and the government should strengthen policy support and financial guidance, set up a special development fund for agricultural products with geographical indications, and subsidize the cost of farmers' green planting technology transformation, enterprise brand building and quality traceability system construction; Introduce preferential tax and credit support policies to reduce the burden of industrial operation, encourage the innovation and development of enterprises and improve the quality of farmers. Strengthen industrial planning and infrastructure construction, optimize logistics distribution network and cold chain storage facilities, reduce logistics costs, ensure product freshness and quality, improve the overall operational efficiency of the industry, and provide solid policies and material guarantees for industrial development.

Secondly, enterprises should strengthen the sense of self-discipline, establish and improve the internal quality supervision and management mechanism, strengthen the quality awareness training and performance appraisal of employees, and implement the quality responsibility to all aspects of production and sales. Increase R&D investment, innovate product categories and processing technology, develop high value-added products such as yellow peach juice, preserved fruits, and freeze-dried fruits, and expand profit margins and market demand. Actively participate in the formulation of industry standards and brand maintenance actions, cooperate with the government and industry organizations to combat infringement, enhance the overall integrity and brand image of the industry, and promote the healthy and sustainable development of the industry.

At the same time, it is also possible to establish an incentive mechanism for consumer participation such as online reporting platforms and hotlines, so as to optimize the process while ensuring the security and privacy protection of reporting information. In order to mobilize the enthusiasm of consumer supervision, material rewards and spiritual commendations are given to effective reports. Through activities such as lectures on the quality and safety of agricultural products and popularization of geographical indication products, consumers will be enhanced to discern and participate in awareness, and consumer education will be strengthened.

Acknowledgments

This work is supported by Anhui University of Finance and Economics undergraduate innovation and entrepreneurship training program "The 'Free Rider' Problem in the Construction of Geographical Indications for Agricultural Products--A Case Study of Dangshan Yellow Peach in Anhui Province" (Project No:202310378305).

References

- [1] Akerlof, George A.: The Market for Lemons: Quality Uncertainty and the Market Mechanism, *The Quarterly Journal of Economics*, Vol. 84 (1970) No.3, p.488-500.
- [2] Spence, Michael: Job Market Signaling, *The Quarterly Journal of Economics*, Vol. 87 (1973) No.3, p.355-374.

- [3] Stiglitz, Joseph E.: The Theory of "Screening", Education, and the Distribution of Income, *American Economic Review*, Vol. 65 (1975) No.3, p.283-300.
- [4] Li, Chunyan; Ban, Qi; Gao, Jianmei; Ge, Lanqing; Xu, Rui: The Role of Geographical Indication Products in Promoting Agricultural Development—A Meta - Analysis Based on Global Data, *Agriculture*, Vol. 14 (2024) No.10, p.1831.
- [5] Fama, Eugene F.: Agency Problems and the Theory of the Firm, *Journal of Political Economy*, Vol. 88 (1980) No.2, p.288-307.
- [6] Holmström, Bengt: Managerial Incentive Problems: A Dynamic Perspective, *The Review of Economic Studies*, Vol. 49 (1982) No.S1, p.169-182.
- [7] Nocke, Volker; Strausz, Roland: Collective Brand Reputation., *Journal of Political Economy*, Vol. 131 (2023) No.1, p.1-58.
- [8] Winfree, J. A., & J. J. McCluskey: Collective Reputation and Quality, *American Journal of Agricultural Economics*, Vol. 87 (2005) No.1, p.206-213.
- [9] Kim, Y & G. C. Loury: Collective Reputation and the Dynamics of Statistical Discrimination, *International Economic Review*, Vol. 59 (2018) No.1, p.3-18.