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Consumer Preference on Food Habit of Finfish and Shellfish

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Seafood consumption is a global phenomenon, with finfish and shellfish being the most flavored choices. Consumers seek a balance between taste and health, sustainability, and ethics. Finfish like salmon, tuna, and cod are rich in protein and omega-3 fatty acids, benefiting heart and brain health. Shellfish such as shrimp, crab, and oysters offer high protein, low calories, and essential nutrients like zinc and iron. Taste, health, sustainability, and ethics influence consumer preferences in the seafood industry. People desire delicious and nutritious options. Health-conscious consumers prioritize seafood aligned with their dietary needs. Concerns about sustainability drive choices towards responsibly sourced species. Ethical considerations favor methods minimizing environmental impact and protecting aquatic ecosystems. Understanding these preferences is vital for the industry's success. Suppliers can meet demands by offering a wider range of sustainably sourced seafood and transparent product information. Emphasizing nutritional value attracts health-conscious consumers. Sustainable and ethical practices enhance the industry's reputation and contribute to ecological preservation. In conclusion, consumer preferences shape the seafood industry. By exploring diverse seafood options, considering influencing factors, acknowledging nutritional value, and ensuring availability, the industry can cater effectively to consumer demands while promoting sustainability and ethical practices. Adapting to these preferences is key to maintaining a thriving and ethical seafood industry amid evolving global tastes and concerns

Keywords

Consumer preference, Finfish, Health benefits, Shellfish, Sustainability

Introduction

Seafood has been a staple food in human diets for centuries like fish, shrimp, crab, lobsters, and clams. providing not only a rich source of essential nutrients but also a unique culinary experience. Within the seafood category, finfish and shellfish hold a special place. Finfish, as the name suggests, refers to fish with a distinct backbone, including species such as salmon, cod, tuna, and tilapia. On the other hand, shellfish refers to a broad category of aquatic creatures with shells or exoskeletons, which includes crustaceans like shrimp, lobster, and crab, as well as molluscs like oysters, clams, mussels, finfish and shellfish are versatile ingredients used to create a wide range of delicious products, each offering unique flavors and culinary possibilities some of the products made from finfish and shellfish are Fish Fillets, Fish Steaks, Surimi Products, Crab Bisque, And Deveined Shrimp. These products offer versatility, convenience, and reduced waste, contributing to the sustainability of the seafood industry. Here are some examples:

Value-Added Products from Finfish and Shellfish

Fish and Shellfish Fillets: Fillets are one of the most common value-added products. They are boneless and ready-to-cook, making meal preparation easier for consumers.

Smoked Fish and Shellfish: Smoking adds flavor and extends shelf life. Smoked salmon, mackerel, and oysters are popular examples.

Canned Seafood: Canned tuna, sardines, anchovies, and shellfish like mussels are preserved in cans, offering a convenient, long-lasting source of protein.

Fish and Shellfish Sauces: Extracts and essences from fish and shellfish can be used to enhance the flavor of various dishes and condiments.

Surimi: A paste made from minced fish, usually used as a base for imitation crab and other seafood products

Fish and Shellfish Sausages: Ground fish or shellfish meat mixed with seasonings, shaped into sausages, and cooked or smoked.

Fish and Shellfish Pâté: Smooth and spreadable mixtures made from fish or shellfish, often combined with herbs and cream.

Byproducts And Sustainable Utilization:

Fish and Shellfish Meal: By grinding and drying fish and shellfish scraps, they can be transformed into high-protein animal feed

Fish and Shellfish Oil: Extracted oils from processing byproducts can be used in various industries, such as pet food, aquaculture, and cosmetics.

Fish Skin Leather: Fish skins, which are typically discarded, can be processed to create sustainable leather for fashion and accessory industries.

Fish and Shellfish Fertilizer: Organic fertilizer can be produced from processing byproducts, benefiting agriculture.

Fish Bone Broth: Boiling fish bones releases nutrients, producing a nutritious and flavorful broth used in culinary applications.

Shellfish Shell Craft: Shell remnants from molluscs like clams and oysters can be used in crafts and art.

By developing value-added products and utilizing byproducts, the seafood industry can maximize the utilization of fish and shellfish

resources while reducing waste and environmental impact. In the financial year 2021, India's smallest union territory, Lakshadweep, had the highest fish consumption volume, which stood at 125 kilograms per capita. Following Lakshadweep was Goa, with a fish consumption volume of 78 kilograms per capita. On average, the overall fish consumption per capita in India

was 6.31 kilograms during that year.

Important finfish and shellfish

Many diverse species of finfish and shellfish are found throughout the globe some among which are enlisted below Table 1

Table 1. Commercially Important Finfish and Shellfish

Sl. No.	Scientific name	Common name
1.	<i>Salmo salar</i>	Atlantic salmon
2.	<i>Thunnus orientalis</i>	Pacific bluefin tuna
3.	<i>Gadus morhua</i>	Atlantic cod
4.	<i>Hippoglossus hippoglossus</i>	Atlantic halibut
5.	<i>Oncorhynchus mykiss</i>	Rainbow trout
6.	<i>Lates calcarifer</i>	Sea bass
7.	<i>Pagrus auratus</i>	Snapper
8.	<i>Rastrelliger kanagurta</i>	The Indian mackerel
9.	<i>Sardinella longiceps</i>	Indian oil sardine
10.	<i>Anguilla rostrata</i>	American eel
Shellfish		
1.	<i>Penaeus monodon</i>	Tiger prawn
2.	<i>Panulirus guttatus</i>	Spotted Spiny Lobster
3.	<i>Portunus sanguinolentus</i>	three-spot swimming crab
4.	<i>Pinctada fucata</i>	Pearl oyster
5.	<i>Mercenaria mercenaria</i>	The Hard Clam
6.	<i>Mytilus edulis</i>	The blue mussel
7.	<i>Argopecten irradians</i>	Bay scallop
8.	<i>Turbo sazae</i>	sea snail
9.	<i>Sepioteuthis lessoniana</i>	Bigfin reef squid
10.	<i>Octopus vulgaris</i>	Common octopus

These are the few examples among many species of finfish and shellfish that are preferred as a delicacy and serve as a food commercial importance in different regions of the world. Additionally, there are various types of freshwater and other lesser-known shellfish species. The world of finfish offers an incredible diversity of flavours and textures. Salmon, known for its rich and buttery taste, is a popular choice among seafood enthusiasts (Mozaffarian *et al.*, 2006). Tropical varieties of fish and products made from them hold significant appeal in the seafood industry due to their unique flavors, vibrant colors, and diverse culinary applications. These fish species are typically found in warm waters and are commonly sourced from regions such as Southeast Asia, the Caribbean, and parts of Africa and South America. Some popular tropical fish species include red snapper, grouper, mahi-mahi, tilapia, and barramundi.

Consumer preferences For Tropical Fish and their products Are Influenced By Several Factors:

1. Flavor and Culinary Versatility: Tropical fish are known for their distinct and delicious flavors, which cater to a wide range of culinary preferences. They can be grilled, fried, baked, or used in various seafood dishes, making them a versatile choice for consumers who enjoy diverse gastronomic experiences.

2. Novelty and Exotic Appeal: Tropical fish offer a sense of novelty and exoticism to consumers, especially those who seek unique dining experiences. Their vibrant appearance and

different taste profiles attract adventurous eaters looking to explore new flavors.

3. Nutritional Benefits: Like other types of fish, tropical varieties are rich in essential nutrients such as protein, omega-3 fatty acids, vitamins, and minerals. Health-conscious consumers appreciate their nutritional value and inclusion in a balanced diet.

4. Sustainable Sourcing: As consumer awareness about sustainability grows, there is an increasing demand for responsibly sourced tropical fish. Consumers are more likely to choose products that come from well-managed fisheries or sustainable aquaculture operations to support the long-term health of marine ecosystems.

5. Local and Cultural Significance: In regions where these fish are traditionally caught and consumed, there is a strong cultural attachment to them. Local consumers often prefer these varieties for their connection to heritage and culinary traditions.

6. Availability and Accessibility: The availability of tropical fish in the market plays a significant role in consumer preferences. Retailers and restaurants that offer a wide selection of tropical fish products make it easier for consumers to access and enjoy these delicacies.

In summary, tropical varieties of fish and products made from them are gaining popularity in the seafood industry due to their exceptional flavors, culinary versatility, and cultural significance. Consumers appreciate the novelty and exotic appeal of these fish, and their nutritional benefits also contribute to their growing preference. As sustainability concerns continue to influence consumer choices,

responsible sourcing practices play a crucial role in determining the success of tropical fish products in the market. By understanding and catering to these preferences, the seafood industry can effectively capitalize on the appeal of tropical fish and create a positive impact on both consumer satisfaction and environmental conservation.

Tuna, characterized by its meaty texture, is often sought after for its robust flavour and health benefits. Tilapia, a mild white fish, is widely available and appreciated for its affordability.

Shellfish, too, provide a wide range of options to cater to various palates. Shrimps, both fresh and frozen, is a beloved choice due to its sweet and succulent taste. (Naspetti *et al.*,2007) Lobster, with its tender meat and delicate flavour, is often considered a luxurious treat. Mussels and clams are enjoyed for their briny taste and commonly used in soups, stews, and pasta dishes. Oysters can be consumed in various ways, depending on individual preferences and regional culinary traditions. The three common methods of consuming oysters are

Oysters can be consumed in various ways, depending on individual preferences and regional culinary traditions. Here are the common ways oysters are prepared and consumed:

1. Raw: Raw oysters are often served on the half shell, which means the oyster is shucked (opened) and presented in its shell with the meat intact. They are typically served cold, sometimes on a bed of ice, and accompanied by condiments like lemon wedges, cocktail sauce, mignonette sauce, or hot sauce. Many oyster aficionados

enjoy the fresh taste and briny flavor of raw oysters.

2. Half-Shell Grilled or Broiled: Oysters can also be cooked while still in the half shell. They are often grilled or broiled with toppings like garlic butter, cheese, or herbs, giving them a delightful smoky flavor and a slightly cooked texture. Grilled or broiled oysters offer a unique experience that combines the raw oyster's natural taste with the added richness of the toppings.

3. Cooked Preparations: Oysters can be cooked in various ways, including frying, baking, steaming, or stewing. Fried oysters are popular in some regions and are typically coated in batter or breadcrumbs before frying to create a crispy texture. Baked or steamed oysters may be served with additional ingredients like cheese, spinach, or breadcrumbs, depending on the recipe. Oyster stews and soups are also common, where oysters are cooked in a flavorful broth along with other ingredients.

4. Fully Boiled: Boiling oysters is less common, as it can result in a loss of their delicate texture and taste. However, some traditional dishes and recipes call for fully boiled oysters, especially in certain stews or Cajun-style gumbo.

The preparation method can significantly influence the taste and texture of oysters. Raw oysters are prized for their freshness and brinness, while cooked oysters offer a different flavor profile and texture. It's important to note that consuming raw oysters carries a risk of

foodborne illnesses, such as from bacteria like *Vibrio vulnificus*, so it's essential to source oysters from reputable and safe suppliers.

Overall, the diverse ways of preparing and consuming oysters cater to a wide range of tastes and preferences, making them a versatile and beloved delicacy in many culinary traditions around the world and scallops, with their unique textures and flavours, are highly valued in the culinary world

Allergic reactions to shellfish can be severe and even life-threatening, so it's important to take them seriously. If someone is experiencing allergic reactions to shellfish consumption, it's recommended that they avoid all shellfish and seek medical advice. It's also possible that cross-reactivity between different types of seafood, including finfish, could occur in individuals with shellfish allergies. Here's a detailed analysis of allergic reactions and their potential impact on consuming different types of seafood

Shellfish Allergies

Shellfish allergies are divided into two main groups: crustaceans and molluscs

1. Crustaceans: This group includes shrimp, crab, and lobster within minutes to a few hours after consumption. Symptoms may include: Allergic Skin reactions: Itchy, hives, eczema, or swelling (angioedema)

- Gastrointestinal symptoms: Nausea, vomiting, diarrhea, or abdominal pain
- Respiratory symptoms: Sneezing, runny or congested nose, coughing, wheezing, shortness of breath, or chest tightness

- Anaphylaxis: A severe and potentially life-threatening reaction characterized by difficulty breathing, a drop in blood pressure, loss of consciousness, and shock.

2. Molluscs: This group includes clams, mussels, oysters, scallops, and squid.

Allergic reactions to molluscs can be similar to those of crustaceans. Symptoms may include:

- Skin reactions
- Gastrointestinal symptoms
- Respiratory symptoms
- Anaphylaxis

Cross-Reactivity:

Cross-reactivity can occur when the immune system reacts to proteins that are structurally similar to those in the allergenic food. In the case of shellfish allergies, there is potential for cross-reactivity between different types of seafood, including finfish. Cross-reactivity can vary among individuals.

For example, someone with a shellfish allergy might also react to certain types of finfish like cod, haddock, and whiting. These fish are part of the Gadidae family, which is distantly related to crustaceans and mollusks. However, it's important to note that cross-reactivity is not universal, and an individual's specific allergen triggers can vary.

Preventing Allergic Reactions:

If someone is experiencing allergic reactions to shellfish, it's important to Avoid all shellfish- This includes crustaceans and molluscs.

- Read labels -Be vigilant about reading ingredient labels on processed and packaged foods to avoid any traces of shellfish.
- Inform restaurants: When dining out, inform the restaurant staff about the allergy to prevent cross-contamination.
- Carry an epinephrine auto-injector: For those with a history of severe reactions, an epinephrine auto-injector (e.g., EpiPen) should be carried at all times.

If someone suspects they have a shellfish allergy, they should consult an allergist for proper diagnosis and guidance on managing the allergy. It's important to note that individuals who are allergic to shellfish might not necessarily be allergic to all types of finfish. The allergens responsible for shellfish allergies are different from those in finfish, so not all seafood will trigger the same reaction. However, cross-reactivity is possible in certain cases, and it's crucial to get professional medical advice to determine the extent of the allergy and which foods to avoid.

Several Factors Influence Consumer Preference for Finfish

Taste and texture play a significance role as individual have unique attributes in terms of flavours and mouth feel. Some may prefer stronger flavours. Texture preferences range from firm and meaty to tender and flaky, providing options for different culinary needs. Health benefits are another influential factor. Finfish are a rich source of lean protein, omega-3 fatty acids, vitamins and minerals. These nutrients contribute to heart health, brain function, and overall well-being, making finfish

an attractive choice for health-conscious consumers.

Sustainable seafood production refers to the responsible harvesting or farming of fish and shellfish in a manner that ensures the long-term health and viability of marine ecosystems, minimizes environmental impacts, and supports the well-being of coastal communities. Consumers are increasingly concerned about the environmental and ethical implications of their food choices, leading to a growing demand for sustainably sourced seafood. To address this demand and provide assurance to consumers, several certification agencies have emerged to verify and label seafood products as sustainable. One of the most prominent certification agencies in this context is the Marine Stewardship Council (MSC).

Sustainable Seafood Production Practices

- **Wild-Capture Fisheries:** For wild-caught seafood, sustainable practices involve adhering to catch limits based on scientific assessments of fish stocks to prevent overfishing. Selective fishing techniques that reduce bycatch and minimize damage to non-target species and marine habitats are also essential.
- **Aquaculture:** Sustainable aquaculture practices (Grieve *et al.*,2017) aim to minimize the use of antibiotics and chemicals, prevent escapes of farmed species into the wild, and manage the discharge of waste and effluents to minimize environmental impacts.

2. Marine Stewardship Council (MSC):

- The MSC is a globally recognized certification and eco-labeling program for sustainable seafood. It was established to address the issue of overfishing and provide consumers with a way to identify and support sustainable seafood choices.

- The MSC assesses fisheries and aquaculture operations against rigorous sustainability standards, which include factors such as the status of fish stocks, the impact on marine ecosystems, and the effectiveness of management practices.

- If a fishery or aquaculture operation meets the MSC's standards, it can be certified, and products from that source can display the MSC's blue ecolabel, which assures consumers that the seafood comes from a sustainable source.

- Consumer Acceptability:

- The MSC's ecolabel has gained widespread recognition and trust among consumers. Studies have shown that consumers are more likely to choose products carrying the MSC label, as it provides confidence that their seafood choices align with their sustainability values.

- By choosing MSC-certified products, consumers can actively contribute to the conservation of marine ecosystems, support responsible fishing practices, and promote the well-being of coastal communities that depend on fisheries for their livelihoods.

- Moreover, as awareness of sustainability issues grows, consumers are becoming more willing to pay a premium for certified sustainable

seafood, further incentivizing producers and retailers to offer and promote such products.

In conclusion, sustainable seafood production is crucial for maintaining the health of our oceans and meeting the growing demand for seafood while preserving marine ecosystems. Certification agencies like the Marine Stewardship Council play a vital role in assuring consumers that the seafood they are purchasing is sourced sustainably. Consumer acceptability of sustainably produced seafood is on the rise, driven by increased awareness of environmental and ethical concerns. By choosing certified sustainable seafood, consumers can make a positive impact on the seafood industry and support efforts to protect the world's oceans for future generations.

Factors influencing consumer preference for shellfish

Like finfish, taste and texture are crucial factors in consumer preference for shellfish. The sweetness and brininess of shellfish, such as shrimp and lobster, appeal to many seafood lovers. Ethical considerations surrounding animal welfare influence consumer preferences for shellfish (Kris- Etherton *et al.*, 2002). Some consumers prioritize supporting fisheries and farms that promote the humane treatment and sustainable practices. By selecting good harvesting practices that minimizes stress and promote animal welfare, consumers can align their ethical values.

Table 2. Nutritional Value of Various Finfish & Shellfish

Nutrient (per kg)	Salmon	Tuna	Cod	Tilapia	Shrimp	Lobster
Protein	20-25%	25%	17%	20-22%	20%	17%
Omega-3 Fatty Acids	2-3%	2%	0.1%	0.1%	0.3%	0.1%
Vitamin B12	71%	39%	21%	8%	12%	43%
Vitamin D	47%	15%	1%	1%	0%	5%
Selenium	52%	59%	31%	31%	38%	95%
Niacin	59%	95%	12%	21%	7%	13%
Phosphorous	45%	36%	17%	23%	10%	20%
Iron	5%	4%	2%	3%	6%	7%
Copper	10%	8%	3%	7%	4%	10%
Zinc	8%	6%	2%	5%	5%	9%

(Roheim *et al.*,2010)

Nutritional value and health benefits

Both finfish and shellfish offer a wide array of essential nutrients and health benefits, making them valuable additions to a balanced diet. (kallas *et al.*, 2017) Here are some of the nutritional components and health benefits of these series

Nutritional Value of Finfish:

Protein: Finfish are excellent sources of high-quality protein, which is crucial for muscle growth and repair, enzyme production, and overall body function.

Omega-3 Fatty Acids: Certain species of finfish, such as salmon, mackerel, and sardines, are rich in omega-3 fatty acids. These essential fats have been linked to numerous health benefits, including supporting heart health, reducing inflammation, and promoting brain function.

Vitamins: Finfish contain various vitamins, including vitamin D, vitamin B12, and several B-complex vitamins. Vitamin D is essential for bone health and immune function, while vitamin B12 is crucial for nerve function and red blood cell production.

Minerals: Finfish provide essential minerals like iron, zinc, phosphorus, and selenium. These minerals play various roles in the body, such as supporting immune function, aiding in energy metabolism, and maintaining healthy bones. (Guerrero *et al.*, 2010)

Nutritional Value of Shellfish

Protein: Like finfish, shellfish are also rich sources of protein, providing important amino acids for various bodily functions.

Omega-3 Fatty Acids: Some types of shellfish, such as oysters and mussels, also contain omega-3 fatty acids, albeit in smaller amounts than certain finfish.

Vitamins: Shellfish are particularly high in certain vitamins, including vitamin B12, vitamin D, and vitamin A. Vitamin A is essential for vision, immune function, and skin health.

Minerals: Shellfish are notable for their high content of essential minerals, such as iron, zinc, copper, and selenium. (Grunert *et al.*,2005) These minerals are vital for various physiological processes, including immune function and antioxidant defense.

Health Benefits of Finfish and Shellfish

Heart Health: The omega-3 fatty acids found in many finfish and some shellfish have been shown to reduce the risk of heart disease by lowering blood pressure, reducing triglyceride levels, and improving cholesterol profiles.

Brain Health: Omega-3 fatty acids, especially docosahexaenoic acid (DHA), play a critical role in brain development and function. Regular consumption of seafood has been associated with a reduced risk of cognitive decline and improved cognitive performance.

Weight Management: Seafood is a lean protein source, which can aid in weight management by promoting satiety and supporting muscle mass.

Immune Support: The vitamins and minerals present in finfish and shellfish contribute to a robust immune system, helping the body defend against infections and illnesses.

Bone Health: The combination of protein, vitamins, and minerals found in seafood is beneficial for maintaining healthy bones and reducing the risk of osteoporosis.

Anti-Inflammatory Effects: Omega-3 fatty acids in seafood possess anti-inflammatory properties that may

help reduce chronic inflammation and associated diseases (Chyrsochoidis *et al.*, 2005)

Remember that these references cover various aspects of consumer preference related to fish and shellfish. When conducting your research, make sure to explore databases, journals, and publications specific to the topic to find the most current and relevant studies. Additionally, sustainable sourcing of seafood ensures that marine ecosystems are preserved for future generations, supporting both human health and the health of the planet

Availability of species in the market

The availability of different finfish and shellfish species can vary based on factors such as geographical location, fishing seasons, and aquaculture practices. (Anderson *et al.*,1993) Certain species may be more prevalent in specific regions due to local fishing traditions and ecosystems. Advances in transportation and global trade have increased the accessibility of various seafood options, allowing consumers to enjoy a broader range of choices.

Conclusion

Consumer preferences for finfish and shellfish are influenced by factors such as taste, health benefits, sustainability, ethical considerations, and cultural influences. Understanding these preferences is vital for the seafood industry to cater diverse needs and values of consumers. By offering a wide variety of high-quality options, promoting sustainability, and adhering to ethical practices, the seafood industry can ensure the satisfaction of consumers, simultaneously contributing to the long-term health of our oceans.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

Conflict of interest

The authors declare that the manuscript was formulated in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Reference

- Higdon, J.V., Liu, J., (2006). Nutrient Supplements for the prevention of cardiovascular Disease: A Systematic Review. *Nutrition Reviews*, 64(10), 443-454. <https://doi.org/10.1111/j.1753-4887.2006.tb00195.x>
- Kriz-Etherton, P.M., Harris, W.S., Appel, L. J. (2002). Fish Consumption Fish Oil Omega-3 fatty acids, cardiovascular disease circulation, 106 (21), 2747-2757. <https://doi.org/10.1161/01.cir.0000038493.65177.94>
- Mozaffarian, D., Rimm, E.B., (2006). Fish intake, Contaminants, and Human Health: Evaluating the Risks and the benefits *JAMA Network* 296(15) 1885-1889. <https://doi.org/10.1001/jama.296.15.1885>
- Anderson, E. W., & Sullivan, M. W. (1993). The antecedents and consequences of customer satisfaction for firms. *Marketing Science*, 12(2), 125-143.
- Chrysoschoydis, G. M., & Krystallis, A. (2005). Organic consumers' personal values research: Testing and validating the list of values (LOV) scale and implementing a value-based segmentation task. *Food Quality and Preference*, 16(7), 585-599.
- Grieve, H., & Diamond, J. (2017). Public perceptions of wild fish and aquaculture: A systematic review of the evidence. *Fish and Fisheries*, 18(5), 889-907.
- Grunert, K. G. (2005). Food quality and safety: Consumer perception and demand. *European Review of Agricultural Economics*, 32(3), 369-391.
- Guerrero, L., Claret, A., Verbeke, W., & Vanhonacker, F. (2010). Consumer-driven definition of traditional food products and innovation in traditional foods. *Trends in Food Science & Technology*, 21(8), 374-382.
- Kallas, Z., & Gil, J. M. (2017). Consumer preferences, trust, and willingness to pay for safer fish in Spain. *Food Control*, 73(Part B), 1362-1370.
- Naspetti, S., Zanolini, R., & Gaggi, C. (2008). Consumer motivations in the purchase of organic food: A means-end approach. *British Food Journal*, 110(9), 943-956.

Roheim, C. A., & Johnston, R. J. (2010). A battle of taste and environmental convictions for seafood: A discrete choice model of field-to-fork seafood choices. *American Journal of Agricultural Economics*, 92(4), 1226-1233.