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Optimal Regulatory Response to Food Fraud

Food fraud refers to the deliberate substitution, addition, tampering, or misrepresentation of food for economic gains. In this context, food fraud can be divided into two broad categories: food adulteration and mislabeling. While food adulteration can be defined as the intentional substitution or addition of substances in a food product to reduce its costs of production, mislabeling refers to acts of misrepresentation of the type or quality of food products. Food fraud is motivated by economic gains and is enabled by the fact that information about the nature of credence goods is typically asymmetric – while product suppliers know the type/quality of their offering, this information is hidden to consumers even after purchase and use of the product in question. While certification and labeling can resolve the information problem faced by consumers, imperfect enforcement of labeling and/or certification requirements creates opportunities for producers to mislabel or adulterate food products.

Although food fraud is as old as commerce itself, its intensity and frequency have been on the rise in recent years due to the globalization and growing complexity of the multi-tiered agri-food marketing system. In the United States, for instance, the total number of con-

firmed food adulteration incidents in 2011 and 2012 was 60% higher than those between 1980 and 2010. Between December 2018 and April 2019, Interpol and Europol launched a massive food fraud investigation, called the OPSON VIII operation, in 78 countries in Africa, Asia, Europe, and North America, which resulted in the total seizure of around 16,000 tons and 33 million liters of adulterated food and beverage, respectively. While the actual cost of food fraud is unknown (since at least some fraudulent behavior goes undetected), recent estimates suggest that food fraud may cost the global food industry \$30 billion to \$40 billion per year.

In recent years, food fraud incidents like the Chinese melamine milk scandal, the European horsemeat scandal, and the Italian olive oil fraud incidents have captured the attention of the media, consumers, and governments around the world and have raised serious concerns about the integrity of the agri-food marketing system.¹ Both the U.S. Congressional Research and the U.S. Governmental Accountability Office have published reports addressing food fraud concerns and highlighting federal and congressional actions to combat food fraud. Similarly, the European Union considers food fraud to be one of the top five challenges for the European econo-

¹The 2008 Chinese milk scandal involved selling watered-down milk as high-quality milk while adding melamine to boost the milk's protein content. Melamine is harmful to human health, and as a result, the contamination affected around 290,000 babies worldwide, 6 of whom died and 52,000 of whom were hospitalized. In 2013, authorities throughout Europe found beef products containing undeclared or improperly declared horse meat, an incident known as the European horsemeat scandal. Most of the Italian olive oil fraud incidents involve the adulteration or mislabeling of extra virgin olive oil.

my and has started introducing significant requirements for food traceability and strict enforcement measures, with significant penalties for fraudulent behavior. Combating food fraud has also become a key priority of the Chinese government after the milk scandal, which was a big blow to the booming Chinese dairy industry.

With different countries adopting different measures to combat food fraud, the question that naturally arises is which policy response to food fraud is optimal. Surprisingly, despite the increased importance of this issue, the relevant literature offers little guidance on the effectiveness of different policy responses to food fraud. The few studies on the issue focus on policies addressing mislabeling. To our knowledge, no study has investigated the optimal regulatory response to food adulteration, which can have significantly greater costs than mislabeling.

A recent study published in the latest issue of the *Journal of Agricultural and Resource Economics* addresses this issue and focuses on the optimal regulatory response to both food adulteration and mislabeling. In addition to determining the optimal policy response to food adulteration and mislabeling, the study (i) identifies the policy impact on the purity of labeling and the average product quality in the market and (ii) examines the effectiveness of fraud-detering policies in the presence of political and bureaucratic corruption.

In analyzing the optimal policy response to food fraud, the study explicitly accounts for the empirically relevant heterogeneity in consumer preferences and producer efficiency, endogeneity in producer quality choices, and asymmetries in the probability of food fraud detection. In addition to enhancing the empirical relevance of the study, the explicit consideration of agent heterogeneity and endogenous producer quality choices enables the identification of a critical link between the efficiency of dishonest producers and the fraud-detering policy impact on the purity of labeling and the average product quality in the market.

The analysis shows that the optimal policy response depends on the efficiency of dishonest producers, the type of food fraud, the political objectives of the government, and the relative costs of different fraud-combating mechanisms. For instance, when it is the more efficient producers of the high-quality product that are more likely to

commit fraud, the *only* way to completely deter fraudulent behavior is through a strict monitoring and enforcement system. In contrast, when the less efficient producers are engaged in fraudulent behavior, both increased certification costs and monitoring and enforcement can effectively deter food fraud, with their efficiency ranking (and desirability) determined by the relative costs involved. When the costs of fraud-combating mechanisms are the same under food adulteration and mislabeling, the optimal policy response is stronger under food adulteration than under mislabeling.

Analytical results also show that when the government wants to increase the average product quality in the market while combating food adulteration, strict monitoring and enforcement is more effective than increased certification costs because, while monitoring and enforcement always increase the average product quality, the effect of increased certification costs depends on the efficiency of dishonest producers; when it is the more efficient producers that engage in fraudulent behavior, an increase in certification costs results in reduced (rather than increased) average product quality in the market. Regarding the purity of labeling, it can be improved through an increase in either certification costs or monitoring and enforcement when less efficient producers engage in fraudulent behavior. However, when more efficient producers engage in fraudulent behavior, an increase in certification costs decreases the purity of labeling.

Finally, the study provides important new insights on the role of public sector corruption in food fraud. By reducing the expected costs associated with fraudulent behavior, corruption of the enforcement agency provides increased incentives for food adulteration and mislabeling. When enforcement agency officials engage in bribery, increasing monitoring and enforcement results in increased (rather than reduced) incentives for collusion between dishonest producers and corrupt policy enforcers. This finding is important, as many developing and developed countries are plagued by corruption.

In addition to providing insights on the determinants of the optimal policy response to food fraud, the results of this study can help explain differences in the type and degree of efforts to combat food fraud observed in different countries. The analysis can also provide a theoretical

grounding to empirical studies on the impact of policy choices on producers' decision to engage in food adulteration and mislabeling.

This article is based on:

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