

Food Standards are Good – For Middle-Class Farmers

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Summary. — We estimate the causal effect of food standards on Vietnamese pangasius farmers' wellbeing measured by per capita consumption expenditure. We estimate both the average effects and the local average treatment effects on poorer and richer farmers by instrumental variable quantile regression. Our results indicate that large returns can be accrued from food standards, but only for the upper middle-class farmers, i.e., those between the 50% and 85% quantiles of the expenditure distribution. Overall, our result points to an exclusionary impact of standards for the poorest farmers while the richest do not apply standards because the added gain is too small.

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Key words — food standards, pangasius, instrumental variable, quantile regression, Vietnam, Asia

1. INTRODUCTION

To participate in global value chains producers need to fulfill requirements of food quality and safety regulation of destination markets. Typically, it is not sufficient to comply with the public regulation in the destination countries as foreign market access depends on the ability of exporters to follow private or voluntary food standards.¹ The impact of food standards on the wellbeing of farmers in developing countries has been debated intensively, as the effect may be both positive and negative. Introduction of voluntary standards in a particular agri-food sector is associated with high compliance costs for farmers and this may marginalize the poorest (Henson & Jaffee, 2008; Reardon, Barrett, Berdegue, & Swinnen, 2009). Food standards may also induce negative externality effects on poor farmers because the inability to comply with food safety and quality standards can result in selling to unprofitable markets (Reardon & Farina, 2002). However, it is similarly possible for small-scale producers to benefit from food standards. Application of standards can reduce rural poverty because of increased local demand (Maertens & Swinnen, 2009) and farmers who succeed in complying with private standards can benefit through several channels, either (i) higher net production revenues (Asfaw, Mithöfer, & Waibel, 2010b), (ii) better employment conditions, such as higher wages and longer employment periods (Colen, Maertens, & Swinnen, 2012), or (iii) better production practices and health (Asfaw, Mithöfer, & Waibel, 2010a).

In analyzing the direct impact of food standards on farmers' livelihoods, most of the literature has focused on average impacts. While the average gain from standards is surely interesting, there is, in our view, a case for believing that the gain is unevenly distributed across households of different socio-economic status. First of all, we argue that in rural markets with credit constraints or high financing costs due to information asymmetries, a positive impact of standards is only attributable to farmers in the upper segments of the income or wealth distribution because of excessive financing costs for the poorer farmers. This argument is based on findings in previous studies that show how adoption of standards is to a large extent determined by households' endowments of capital, resulting in a wealth threshold above which application of standards becomes beneficial (see, e.g., Asfaw *et al.*, 2010b; Kersting & Wollni, 2012). Similarly, Neven, Odera, Reardon, and Wang

(2009) report a restraining capital vector for entrance into the supermarket supply chain in Kenya. Their results illustrate that the key suppliers of Kenyan supermarkets are medium-sized, fast-growing commercial farms that hinder participation of small farms and institute the new middle-class. Based on these observations, we believe that obtaining evidence on the impact of standards at different welfare levels can assist in better agricultural policy design.

The decision to adopt food standards can be framed as a case of new technology adoption. Underpinned by concerns about economic growth and poverty reduction, technology adoption models have analyzed how new plant varieties or production techniques are adopted by farmers (Conley & Udry, 2010; Foster & Rosenzweig, 1995; Suri, 2011). However, just as for the food standards literature, a focus on mean impact has left out the possibility of heterogeneous wealth impacts in the adoption of new technologies. We therefore believe our analysis of the distribution of the gain from applying food standards on farmers' wellbeing is also contributing to the technology adoption literature.

We estimate the distributional impact of food standards on consumption expenditure using an original dataset from the Vietnamese pangasius value chain.² To overcome the pervasive endogeneity problems present in this kind of impact estimations with substantial self-selection we use an instrumental variable quantile regression model developed by Abadie, Angrist, and Imbens (2002) to estimate the causal effect of

* The authors would like to thank the staff of the School of Economics and Business Administration and the College of Aquaculture and Fisheries at the Can Tho University, Vietnam. We thank Ydun Donahoe, Mr. Le Dang Trung, Ms. Thi Minh Thai, Miss. Le Canh Bich Tho, Mr. Nguyen Ho Anh Khoa, and student enumerators from the Can Tho University for helping with the organization and management of the fieldwork. Most sincere thanks go to all the persons from the pangasius sector that we interviewed because without them the research for this paper would not have been possible. We also thank the participants of AEM 7650: Development Microeconomics Graduate Research Seminar at the Cornell University for comments on an early draft of this paper. N. Trifković acknowledges gratefully funding from Oticon Foundation, Augustinus Foundation, and Solarfonden in addition to LIFE PhD scholarship awarded by the Faculty of Life Sciences, University of Copenhagen. The usual caveats apply. Final revision accepted: October 30, 2013.

food standards on farmers in selected expenditure quantiles. In order to substantiate our econometric findings and further enrich our understanding of the farmer's situation and decision problem, we complement the statistical analysis with insights from our price data and qualitative interviews with key stakeholders.

The results of our study can be summarized as follows. We find a positive average impact of food standards on household wellbeing: applying standards leads to an average increase in monthly per capita consumption expenditure of about 50% in our most conservative specification. When we allow for varying impacts across the expenditure distribution, we find small and insignificant effects for the poorest half while there are large positive effects for the upper middle-class, defined as households from around the median of the distribution and upward, but excluding the upper 10–15% tail. The gain for the upper middle-class is an increase in consumption expenditure of around 65% in our most conservative estimation. While the insignificant impact of standards on the poorest half of the farmers is clearly the main result, the insignificant impact of adopting standards for the 10–15% wealthiest farmers is also interesting and we argue that the finding is not simply a statistical coincidence. The estimated distribution of the impact of adoption of standards is the outcome of two different conditions: (i) for the poorest farmers there is no gain because of the high costs of financing the investment, and (ii) for the wealthiest farmers there is no gain because they are already able to get high prices on their fish, partly because they produce fish of high quality and partly because they have good working relations with the processors. The overall outcome is that application of food standards in the Vietnamese pangasius sector is benefitting the upper middle-class directly, while the benefits for the poorer segment are either absent or, at best, second order labor market effects as described in Maertens and Swinnen (2009) and Colen *et al.* (2012).

The paper is structured as follows: in Section 2 we briefly review relevant literature on the impact of standards in developing countries. In Section 3, we describe the Vietnamese pangasius sector and provide a brief review of trends in food safety standards. Section 4 presents the survey data and key descriptive statistics, while Section 5 lays out our econometric approach to estimating the welfare impact of food standards and shows the results. We discuss and compare our results with previous studies in Section 6, while we offer a brief conclusion in Section 7.

2. STANDARDS IN DEVELOPING COUNTRIES

The literature suggests that the effects of standards on smallholder producers from developing countries are ambiguous. In an overview of the literature on smallholder participation in high-standards export sectors in Africa, Maertens, Minten, and Swinnen (2012) conclude that the impact of standards is both sector- and country-specific. An important concern is that standards contribute to exclusion of the poorest farmers who, due to weak managerial and capital endowments, fail to comply with strict requirements. The costs of implementing standards at the farm level vary across individual farmers, products, sectors, and geographical location, as conditioned by economies of scale or location-specific factors. Further, noncompliance with standards is linked with exclusion of farmers from high-value export sectors and higher inequality in several studies (Farina & Reardon, 2000; Reardon, Codron, Busch, Bingen, & Harris, 1999).

Conversely, standards can improve the financial position of farmers who succeed in complying with standards (Giovannucci & Ponte, 2005; Maertens & Swinnen, 2009; Reardon *et al.*, 2009). After the initial investments, standards can bring positive financial returns to farmers as they improve access to (and the survival in) new markets, quality, and safety product attributes and competitiveness (Henson & Reardon, 2005; Reardon *et al.*, 1999). The key determinants of the farmers' ability to comply with standards are establishment size, ownership of production and household assets, social capital, information access, and external assistance (Asfaw *et al.*, 2010b; Henson, Masakure, & Cranfield, 2011; Kersting & Wollni, 2012; Reardon *et al.*, 2009). Previous studies have shown a significant relationship between adoption of standards and farm size, the level of physical, social and human capital, weak credit access, and isolation from producer associations (Asfaw *et al.*, 2010b; Narrod *et al.*, 2009; Okello & Swinton, 2007). Thus, it is typically the better-off farmers who apply standards. Similar results hold for the inclusion of smallholders in retail marketing channels and contract farming schemes (Key & Runsten, 1999; Neven *et al.*, 2009; Reardon *et al.*, 2009).

Previous studies of the impact of standards on rural households mainly focus on average effects, thus failing to identify the exact wealth interval at which the impact of standards becomes significant. A somewhat comparable strand of literature on poverty interventions in developing countries shows that the effect of development interventions is usually heterogeneous, i.e., some groups benefit more than others. For example conditional cash transfers do not have the same effect on different income groups (Galiani & McEwan, 2013) and richer households tend to benefit more from rural infrastructure improvements than poorer ones (Khandker, Samad, Ali, & Barnes, 2012). Benefits from participating in high-value export sectors are usually reserved for wealthier households, whether through choosing better marketing channels or contracts (Key & Runsten, 1999; Minten, Randrianarison, & Swinnen, 2009; Neven *et al.*, 2009; Rao & Qaim, 2011). Furthermore, poor farm-households in developing countries exit export sectors while large companies and developing country elites appropriate rents in export value chains (Reardon *et al.*, 1999). These examples illustrate that it is of critical importance to assess the effect of standards at different welfare levels as failing to do so could discount the potential effect of standards on inequality in rural areas.

3. THE PANGASIOUS SECTOR IN VIETNAM

The Vietnamese pangasius sector started developing from household farms that cultivated freshwater species *Pangasius bocourti* (Mekong catfish, *ca basa* in Vietnamese) and *Pangasianodon hypophthalmus* (striped catfish, *ca tra*) in the Mekong River Delta (MRD). These species have been farmed in cages and small ponds since the beginning of the 1960s. Over the last decade the farming of striped catfish has taken primacy over the *basa* variety as it proved easier to spawn and is faster growing. In addition, its quality attributes are better (Phuong & Oanh, 2010), and now it accounts for almost all of farmed pangasius in Vietnam.

(a) Production and export

Pangasius was first exported at the beginning of the 1990s, to Australia. Soon after that, Asian countries, the United States, and the European Union followed (Tuan, 2003).

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