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Impact of European food safety border inspections on agri-food exports: Evidence from Chinese firms☆

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ABSTRACT

The cost of complying with a sanitary standard is certain. However, such measure introduces uncertainty for exporters in relation to border rejections. Shipments may fail to pass inspections and may be refused entry into the importing country. This risk is shaped by variance in the quality of the exported product, and the stringency of the border controls. We examine how the risk of rejection at European borders on safety grounds is affecting Chinese agri-food exporters. We combine information from the European Rapid Alert System for Food and Feed with Chinese firm-level export data by product, destination and year for the period 2000–2011. Information externalities and reputation effects are important. Border rejections amplify the turnover among firms at the extensive margin of trade. This risk is curbing small exporters and resulting in a concentration of Chinese exports among big exporters.

1. Introduction

Trade liberalization drove the average tariff applied to Chinese agri-food exports to the European Union (EU) to a low of 14.6% in 2011.[1] However, access to the European market remains difficult since individual exporters are required to meet regulatory standards, and face procedural obstacles and enforcement. Non-tariff measures (NTMs) may act as substantial barriers in the decision to export because they potentially increase the cost of exporting.[2] This problem is magnified for agri-food products due to stringent sanitary and phytosanitary (SPS) regulations[3] in most developed markets. Exporting countries holding a comparative advantage in these products are often struggling to meet stringent sanitary standards due to inadequate traceability, poor storage, limited access to certification bodies, etc. (Essaji, 2008). While European standards – which often are more restrictive than international ones – are not

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[1] Source: TRAINS (Trade Analysis Information System) database.

[2] E.g., fixed costs such as implementing standards and building up compliance capacities, and recurring costs of documentation for traceability and certification of quality inspections.

[3] Sanitary risk refers to food-borne human illness and animal diseases, and phyto-sanitary risk refers to risks from plant pests and transmission of diseases.

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designed to discriminate against imported goods, certain countries can be priced out of exporting completely.

Interestingly, NTMs also introduce an element of uncertainty related to possible border rejections if shipments do not comply with regulations. The majority of rejections are related to adulteration or misbranding. If exporting firms are unable to meet the required restrictions with a high enough probability, strict regulation and control act as deterrents to trade, especially in sectors heavily affected by sanitary concerns and import refusals, such as seafood (Baylis, Nogueira, & Pace, 2011). While the cost of matching a standard is usually certain, being rejected at the importer's border is a risk faced by the exporter.[4] The risk is shaped by the variance in the quality of the exported products (which can be reduced by investment in quality or controls prior to shipment) and the stringency of the controls at the border. This latter is observable by the exporter but likely endogenous to past rejections, signaling a high level of variance in the quality of the exported products. This is where externalities among exporters from the same country and/or region can emerge for a given product category since part of the cost of being rejected is borne by competitors from the same exporting country. A spell of rejections ultimately can lead to an outright ban on a product from a particular origin;[5] rejections are due to production methods and/or climatic conditions affecting a given country. Taken together, border rejections provide valuable information on NTMs: while details on the occurrence of regulations give evidence on *de jure* NTMs, knowledge about rejections sheds light on their *de facto* trade impact.[6]

NTMs have attracted a lot of attention in the recent trade literature (for a detailed review, see Ederington & Ruta, 2016). The two main issues highlighted are information sources and trade restrictiveness. All these studies face a dilemma: either using indirect evidence on border protection within a gravity perspective which risks capturing much more than NTMs, or using direct – *de jure* – evidence on the presence of NTMs but based on outdated and incomplete data (such as notifications to the WTO).[7] Somewhat surprisingly, the uncertainty component of NTM-related barriers has been mostly overlooked in the literature on NTMs and border inspections. To the best of our knowledge, there are four main papers that provide econometric investigations of the impact of import refusals on agri-food trade but none uses firm-level export data. Three papers deal with inspections conducted by the United States (US), while the fourth examines European refusals. Baylis, Martens, and Nogueira (2009) investigate whether exporters learn from import refusals and whether these refusals are driven by political economy concerns. The analysis is conducted at the macro-level and studies the number of refusals by country of origin, product, and month over the period 1998–2004. The results show that new exporters are less affected than experienced ones by refusals, suggesting that inspections are not random but are targeted at exporters identified previously as unsafe. Furthermore, refusals are not driven only by safety concerns but also by domestic political concerns (such as decreased employment in some sectors). Jouanjean, Maur, and Shepherd (2015) focus more on reputation. Their sample includes US refusals aggregated by country of origin, 4-digit sectors, and year for the period 1998–2008. The authors highlight a neighbor and a sector reputation effect. If the same product from a neighboring country was refused in the previous year, then the odds of a country experiencing at least one import refusal increase by over 100%. At the sector level, the odds of a refusal increase by 62% if a related product from the same country was refused in the preceding year. Grundke and Moser (2014) also adopt an exporter perspective and consider to what extent refusals deter entry in the US. Estimating a gravity equation for 93 product-categories imported to the US in the period 2002–2012, they show that the cost of not complying with US standards is borne by developing countries. EU refusals are used as an instrument because they are expected to be exogenous to US demand. The reasoning made by Grundke and Moser (2014) refers to demand for protection in the US and stricter enforcement of NTMs but like the two previous papers, does not explicitly include uncertainty as a trade barrier. Using data on EU refusals, Jaud, Cadot, and Suwa-Eisenmann (2013) adopt an importer perspective and consider aggregate flows at the product level with no firm dimension. Building on evidence of increasing diversification of EU import sources in agri-food products combined with concentration on a small number of exporting countries, they conclude that entrants start small, while incumbent exporters, which have proved safe, grab most of the EU market share. Although Jaud et al. (2013) also do not mention uncertainty in the import market, the mechanism they refer to is clearly linked to this factor (i.e. sanitary risk in the importing country).

In the present paper we adopt a different perspective: we assess the microeconomic impact of the risk of rejection at the European border on export flows to that market. Food sanitary standards have become an important policy concern in the EU[8] making this market particularly sensitive to the issue at stake. While access to the European market has become easier following tariff reductions, exporters in fact face restrictive food safety requirements and possible rejection. Importantly, we do not investigate the potential effects of European rejections on exports to non-European markets. An interesting falsification test would be to see whether the European rejections have any effect on the exports to non-European countries.[9] However, the latter countries also implement inspection policies and reject unsafe products at their borders. In the absence of information of these rejections, any falsification test is likely to be biased and we only consider the trade effects of European rejections on exports to European countries.

We explicitly investigate the effects of rejections on the export decisions of Chinese firms serving the European market. Overall, China – a large and diversified economy which has encountered repeated problems in rich import markets for foodstuff exports – is an

[4] The cost of matching a standard is certain for the exporter producing a good with its own inputs. If the exporter sources his inputs from many different suppliers, then the cost of achieving a standard may be less certain and would depend on how well the suppliers can reach a given level of product quality.

[5] E.g., in April 2014 the EU banned imports of mangoes from India following the discovery of fruit flies in multiple consignments.

[6] For additional evidence on the importance of distinguishing between *de jure* and *de facto* institutions see e.g. Acemoglu and Robinson (2006).

[7] See Chen and Novy (2012) on the distinction between direct and indirect approaches.

[8] E.g., the 2013 meat adulteration scandal, where food advertised as containing beef was found to contain undeclared horse meat, highlighted the importance of regulations to address market failures.

[9] Trade diversion and deflection effects have been studied for seafood products by Baylis et al. (2011), who highlight some diversion effects, mostly for products facing relatively non-threatening sanitary alerts. In that case, export flows are directed mainly to other high-income countries.