



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

**Food import and food safety in Europe: The role of aflatoxins in pistachios**

Bo Xiong ([boxiong@ucdavis.edu](mailto:boxiong@ucdavis.edu))

Daniel Sumner ([dasumner@ucdavis.edu](mailto:dasumner@ucdavis.edu))

*Agricultural Issues Center, University of California*

*Selected Poster prepared for presentation at the Agricultural & Applied Economics Association's 2013 AAEA & CAES Joint Annual Meeting, Washington, DC, August 4-6, 2013.*

*Copyright 2013 by Bo Xiong and Daniel Sumner. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided this copyright notice appears on all such copies.*

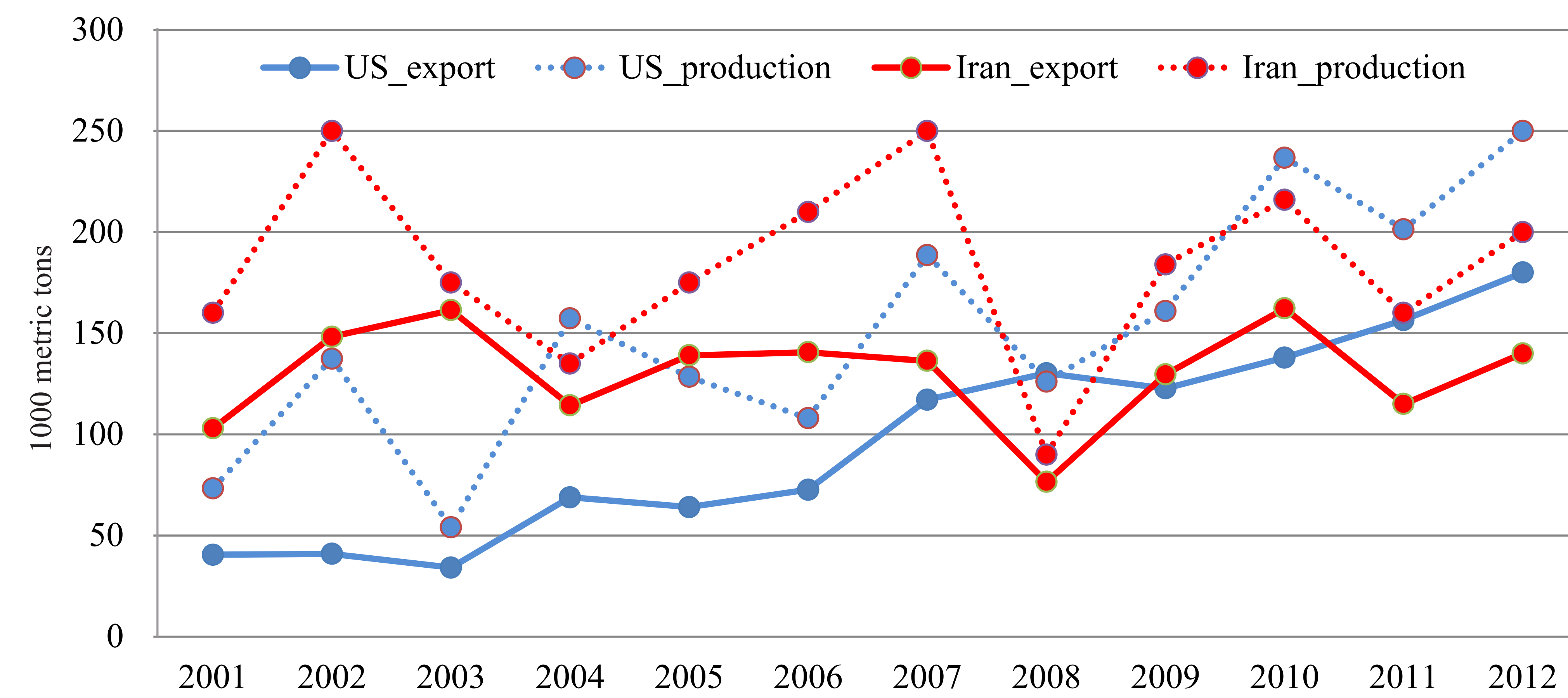
## Introduction

Food safety measures have proliferated over the past decade, particularly in developed countries. Some food safety issues have resulted in high-profile trade disputes at the WTO. Depending on their capacity to conform, food safety regulation affects different producers and processors differently.

The EC aflatoxin control in food and feed is among the most stringent in the world. The European market for pistachio, a tree nut frequently subject to aflatoxin contamination, relies heavily on the imports from Iran and US. By analyzing this market, we illustrate the role of food safety measures in shaping international competitiveness in agriculture.

US and Iran dominate the world production of pistachios. Figure 1 shows that Iran produces 200,000 tons of pistachios each year, of which 70% is exported. The U.S. production has increased from 100,000 tons in early 2000s to 250,000 tons in 2012. Over 70% of U.S. pistachios are exported in recent years.

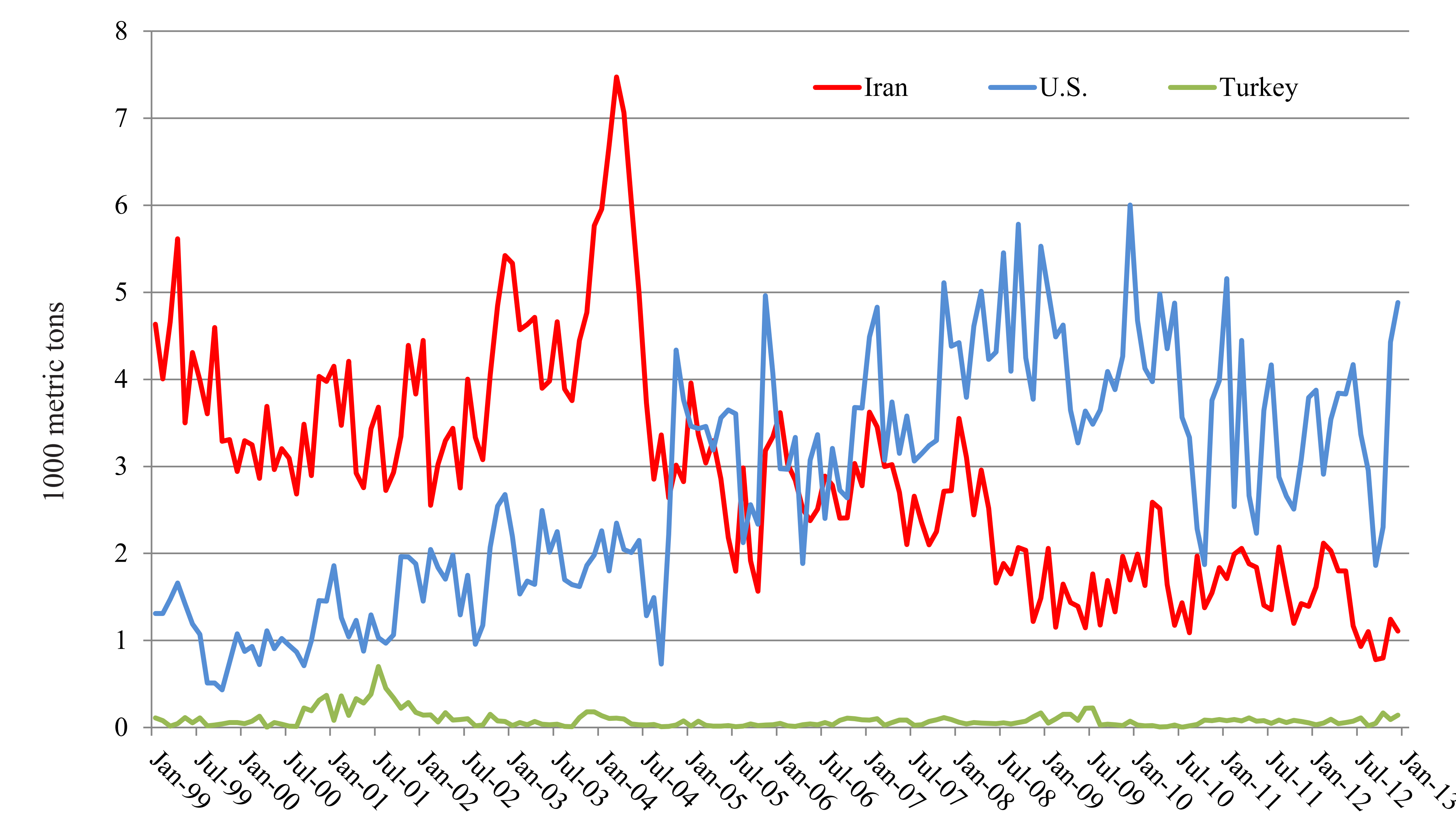
Figure 1. Pistachio production and export, Iran and US



Source: USDA-FAS, PSD.

In the EU market, US has surpassed Iran as the largest pistachio supplier. Figure 2 shows that U.S. monthly pistachio export to the EU increased from 1,000 tons in 1999 to nearly 3,500 tons in 2012. During the same period, Iranian monthly export to EU declined from 4,000 tons to less than 1,500 tons.

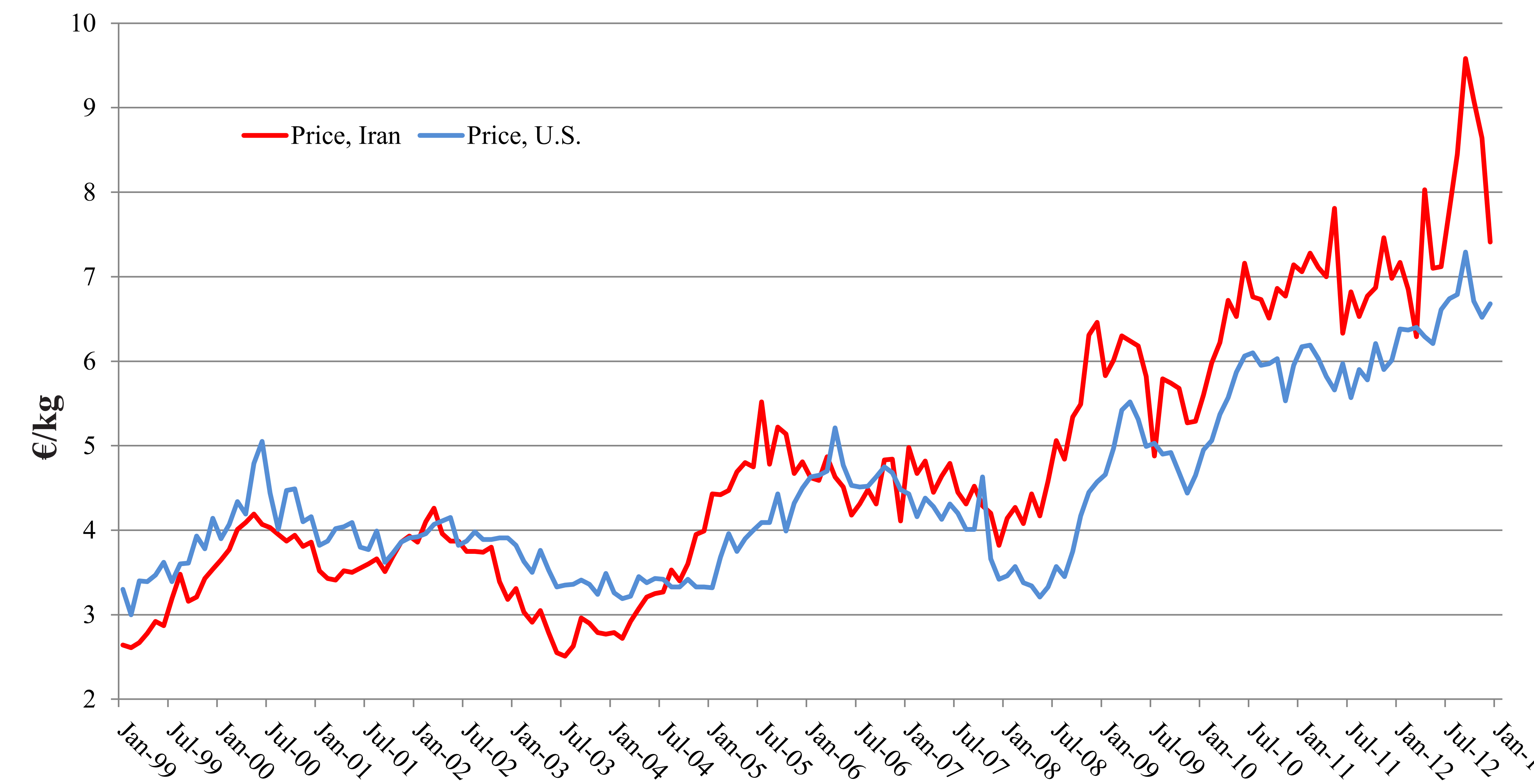
Figure 2. EU pistachio imports from Iran and US



Source: EUROSTAT.

What explains the U.S. rise and the Iranian decline in the EU pistachio market? Figure 3 suggests that the change in relative prices is a cause. Specifically, U.S. pistachios became significantly cheaper than Iranian pistachios after 2008.

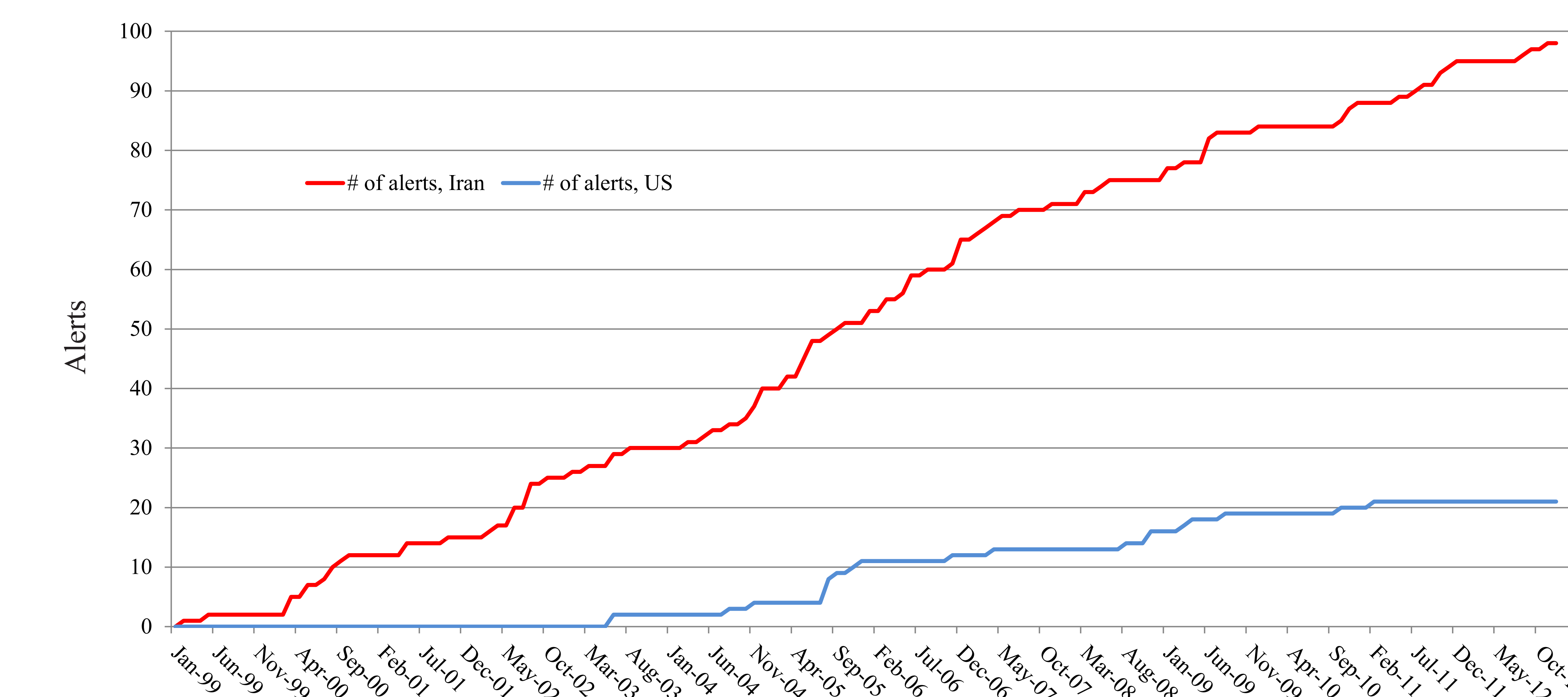
Figure 3. EU import prices of Iranian and US pistachios



Source: EUROSTAT.

The EU aflatoxin concerns is another potential reason. Since 1996 the European Commission has implemented mandatory aflatoxin control in nut products (Xiong and Beghin). The EC maximum residue level is 10 ppb for ready-to-eat pistachios and 15 ppb for pistachios subject to further processing. Figure 4 shows that the RASFF system in EC issues more aflatoxin alerts concerning Iranian pistachios than U.S. pistachios. Specifically, there are 98 alerts targeting aflatoxin-contaminated pistachios traced back to Iran from 1999 to 2012. In comparison, only 21 alerts concern U.S. pistachios during the same period. Therefore, the relative safety of U.S. pistachios might have provided incentives for EU importers to source pistachios from US instead of Iran.

Figure 4. EC aflatoxin alerts concerning pistachios originated from Iran and US



Source: RASFF.



## Data, method, and preliminary results

We model the EU demand for pistachios, with the food safety alerts as potential shifters.

We propose characterizing the EU demand for pistachios using the two equations. Table 1 provides the variable definitions. Because EU is the largest foreign market for both U.S. and Iranian pistachios, changes in the EU demand are likely to affect the prices of U.S. and Iranian pistachios. To address the potential endogeneity of prices, we use the Iranian yield data and U.S. yield data as the instrumental variables.

$$(1a) \quad q_{us} = \alpha_0 - \alpha_1 p_{us} + \gamma p_{iran} + \alpha_2 y + \alpha_3 p_{treenuts}^{other} - \alpha_4 (alert_{us} - alert_{iran})$$

$$(1b) \quad q_{iran} = \beta_0 - \beta_1 p_{iran} + \gamma p_{us} + \beta_2 y + \beta_3 p_{treenuts}^{other} - \beta_4 (alert_{iran} - alert_{us}),$$

Table 1. Definitions for variables

Variable	Definition	Variable	Definition
$q_{us}$	EU import quantity of U.S. pistachios	$p_{us}$	EU import price of U.S. pistachios
$q_{iran}$	EU import quantity of Iranian pistachios	$p_{iran}$	EU import price of Iranian pistachios
$y$	EU monthly disposable income	$p_{treenuts}^{other}$	EU import prices of other tree nuts (e.g., almonds and walnuts)
$alert_{us}$	# of RASFF alerts targeting aflatoxin-contaminated pistachios from US	$alert_{iran}$	# of RASFF alerts targeting aflatoxin-contaminated pistachios from Iran

Preliminary results suggest that U.S. and Iranian pistachios are highly substitutable. More importantly, we find that EC aflatoxin alerts concerning pistachios tend to reduce EU demand for pistachios from the identified origin but increase EU demand for pistachios from the alternative origin.

We use EU monthly import data from January 1999 to December 2012 and compute unit values as measurements of prices. We use quarterly GDP series from EUROSTAT. We get EC-wide alerts concerning aflatoxins in pistachios from the RASFF database. We also compute EU import price of almonds and walnuts from the EU custom data.

## Conclusions

The growing U.S. pistachio industry has shown concern about their food safety and reputation in all markets (Gray et al). The relative safety of U.S. pistachios provides incentives for EU importers to change their import source from Iran to US. The case study illustrates the impact of food safety policies on international competitiveness in agriculture. The difference in food producers and processors' capacity to meet the food safety measures helps explain changes in markets that are not fully reflected in market prices.



## Reference

- Gray, R., Sumner, D. A., Alston, J. M., Brunke, H., & Acquaye, A. K. (2005). *Economic consequences of mandated grading and food safety assurance: ex ante analysis of the federal marketing order for California pistachios*. Giannini Foundation of Agricultural Economics, University of California.
- Xiong, B., & Beghin, J. (2012). Does European aflatoxin regulation hurt groundnut exporters from Africa? *European Review of Agricultural Economics*, 39(4), 589-609.