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The Insect Effect: Phytosanitary Treatments and U.S. Fresh Fruit and Vegetable Trade

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Selected Paper prepared for presentation at the International Agricultural Trade Research Consortium's (IATRC's) 2015 Annual Meeting: Trade and Societal Well-Being, December 13-15, 2015, Clearwater Beach, FL.

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The Insect Effect: Phytosanitary Treatments & US Fresh Fruit and Vegetable Trade

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Presented at IATRC Annual Meeting

Clearwater Beach, Florida

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Fumigation



Cold Treatment



Fumigation & Cold Treatment



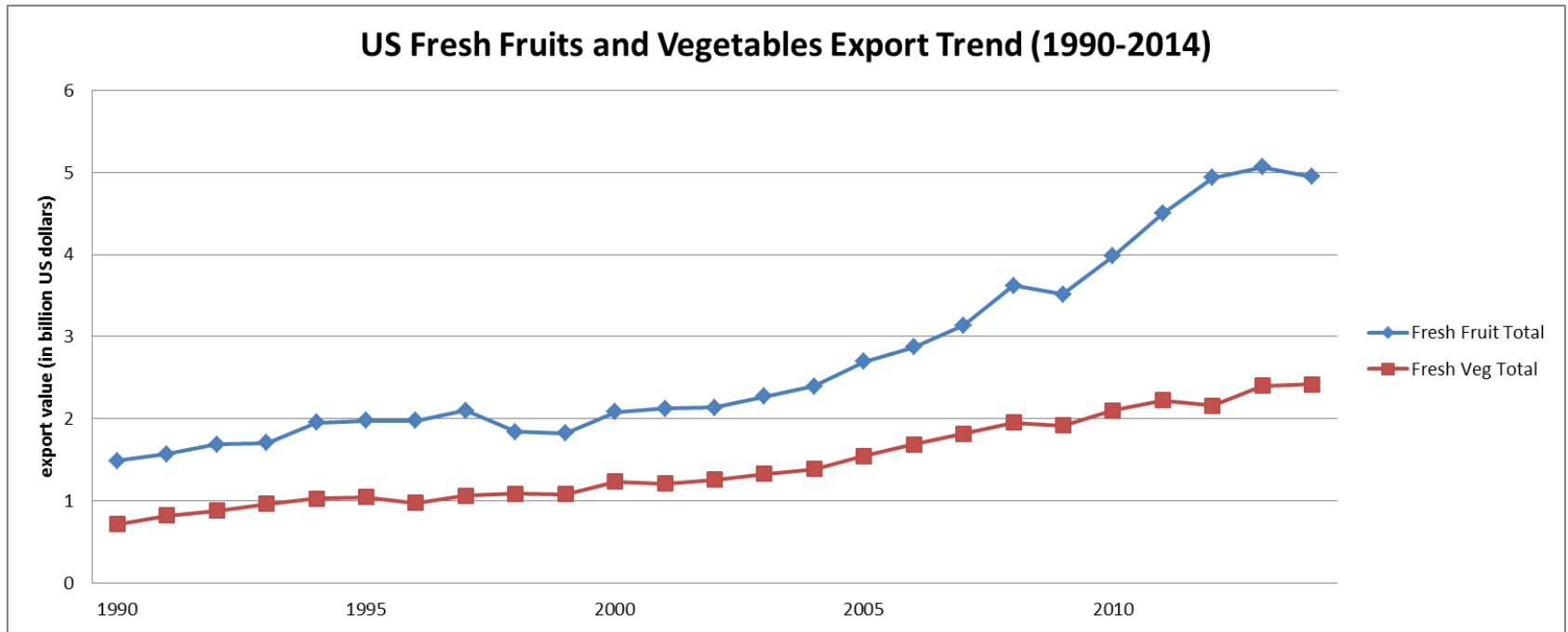
Other Treatment



Motivation

WTO reports nearly 300 disputes related to SPS measures since 1995

- Over 20% of these are related to fruits and vegetables



Literature Review

- Major obstacle of previous work:
 - a. Comprehensive database
 - b. Limitations of TRAINS data
- Peterson et al. (2013) and Grant et al. (2015) built novel US-World bilateral import and export datasets, respectively.
- Average phytosanitary treatment has negative effect on fresh fruits and vegetables trade (increase cost).

Purpose: Robustness Check

- Peterson et al. (2013) Data: Import Data Only.
- Grant et al. (2015) Data: Nine Export Commodities
- Our data: Complete Import and Export Data
- Difference between export side and import side:
 - US impose regulations on import
 - ROW impose on US export side

Data Comparison

Grant, et al (2015) Data

- Product Categories: 9 (6 fruit, 2 vegetable, 1 nut)
- Export Ratio: 65% and 8% US total export of fresh fruits, and of fresh vegetables, respectively

Our Export Data

- Product Categories: 59 (30 fruit, 27 vegetable, 2 nut)
- Export Ratio: 95% and 85% US total export of fresh fruits, and of fresh vegetables, respectively

Data Description

Data Type: Panel Data

Sample Period: 1999-2008

Number of Countries: 114

Number of Commodities: 59

Number of Observations: 30,516

Key Variables

- ID: Import/Export Indicator variable (1=import)
- Treatment: dummy variable
 - country-year-commodity triplet
 - any phytosanitary treatment
- Learning by doing effect:
 - Experience: cumulative number of commodities that an exporter must treat
 - **Treat*Exper: captures learning-by-doing effects**

Data

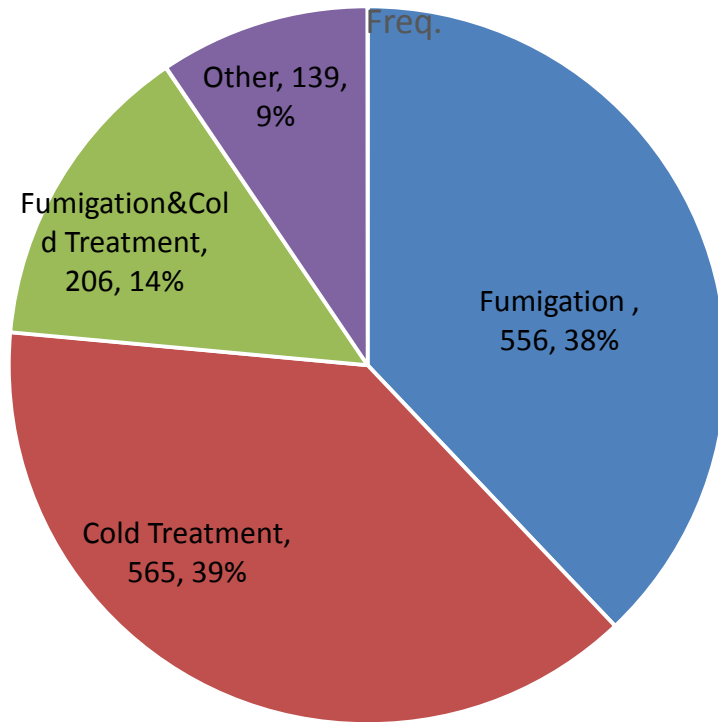
- Import Side

Type	Treat	Total	Ratio
fruit	1,024	4,048	25.30%
nut	0	0	0.00%
veg	442	4,949	8.93%
Total	1,466	8,997	16.29%

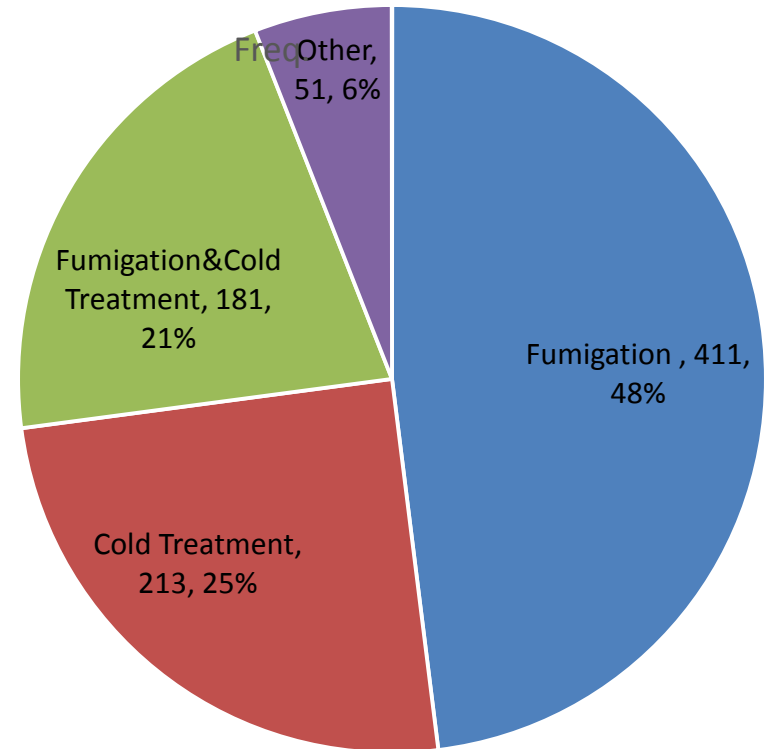
- Export Side

Type	Treat	Total	Ratio
fruit	748	13,454	5.56%
nut	62	2010	3.08%
veg	46	10,866	0.42%
Total	856	26,330	3.25%

Import Side



Export Side



1. Holding countries, commodities, and time period the same, US requires more phytosanitary treatments on its import than other countries require on our exports.
2. US requires more cold treatment than others do.

Empirical Model

- Gravity model : Baldwin and Taglioni (2006)
- Variable of interests:
 - a. Treatment
 - b. Experience & Treat*Exper
 - c.. Interactions of ID and above

Empirical Model

- $V_{odk} = \exp[\pi_d + \pi_k + \pi_t + \beta_1 \ln GDP_{dt} + \beta_2 FTA_{dt} + \beta_3 \ln(1$
- V_{odk} is trade value (US import or export)
- π_d , π_k , and π_t are country, commodity, and year fixed effect dummies.
- $exper$ is the cumulative experience variable.
- $treat_{dkt}$ is the aggregated treatment dummy.

Estimation Method:

- OLS: Benchmark
- Poisson Regression
- Zero Inflated Poisson Regression
- Heckman Model

Variable	OLS	Poisson	ZIP	Heckman
Treatment	-2.06***	-1.21***	-1.20***	-1.47***
ID*Treat	-1.70***	0.04	0.04	-0.66***

LogExper	0.73***	0.35***	0.35***	0.29***
ID*lexper	-0.33***	-0.25***	-0.25***	-0.19***
lexper*Treat	1.41***	0.56***	0.56***	0.40***

Conclusion

- More treatments required on import side.
- Most of the treatments are on fruit.
- Our results are consistent with previous research, which give a good robustness check.
- In the case of US, the import side is more restricted than the export side in terms of phytosanitary treatments.

Thanks For Your Attention

Any Question?
or
Comments?