A Quantitative Analysis of the Importance of Currency Competitiveness for U.S. Agricultural Trade

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Invited Paper prepared for presentation at the International Agricultural Trade Research Consortium's (IATRC's) 2018 Annual Meeting: Interlinkages among Global Value Chains, Trade, and Transformation of the AgriFood Industry, July 25-27, 2018, Whistler, BC, Canada.

USDA

United States Department of Agriculture

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The Findings and Conclusions in This Preliminary Presentation Have Not Been Formally Disseminated by the U.S. Department of Agriculture and Should Not Be Construed to Represent Any Agency Determination or Policy. This research was supported by the intramural research program of the U.S. Department of Agriculture, Economic Research Service.

Motivation

- The dollar exchange rate is a key component of U.S. agricultural export competitiveness
  - Cooke et al (2016), Gong and Kinnucan (2015), Shane, Roe and Somwaru (2008)
- Web of bilateral exchange rates determines currency competitiveness
  - Dollar value in destination countries influences importer price
  - Competitor exchange rates influence relative prices

Objective: Agricultural REER Index

- Real effective exchange rate (REER) index captures evolution of real currency value
  - Trade-weighted average of bilateral real exchange rates
- Agricultural REER index weights reflect differences relative to merchandise trade
  - China is a more important market for agriculture
    - **7.4%** of U.S. merch. exports vs. **15.3%** of ag. exports*
  - Brazil is a more important competitor for agriculture
    - **1.6%** of global merch. exports vs. **7.0%** of ag. exports*

*2009-11 average values

Comparing Agricultural REERs

- Evaluate weighting methods on ability to explain ag. exports
  - Simple approaches
    - Weight = share of U.S. ag. exports
      - Direct export competition
    - Weight = share of remaining global ag. exports
      - Third-country competition
        - Ag. exports from countries other than U.S.

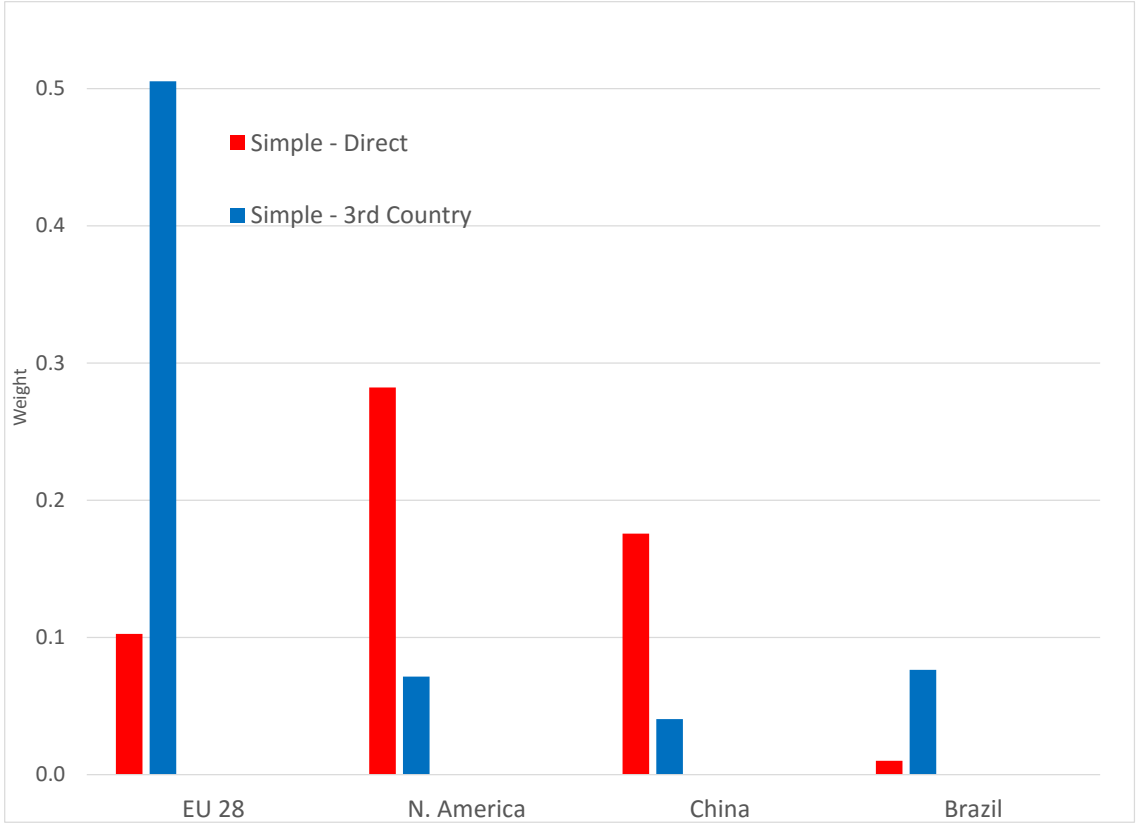
Approach

- Evaluate weighting methods on ability to explain ag. exports
  - Simple approaches
    - Direct export competition weight = U.S. export share
    - Third-country competition weight = global export share
  - Double-weighting - direct and third-country competition
    - Fed Board (Loretan, 2005) & BIS (Klau and Fung, 2006)
  - Different weights for commodities vs. differentiated products
    - IMF (Bayoumi et al, 2005)
      - Commodity weights - importance in global trade
      - Differentiated products triple-weighted - import competition, direct and third-country export competition

Calculating weights: Data

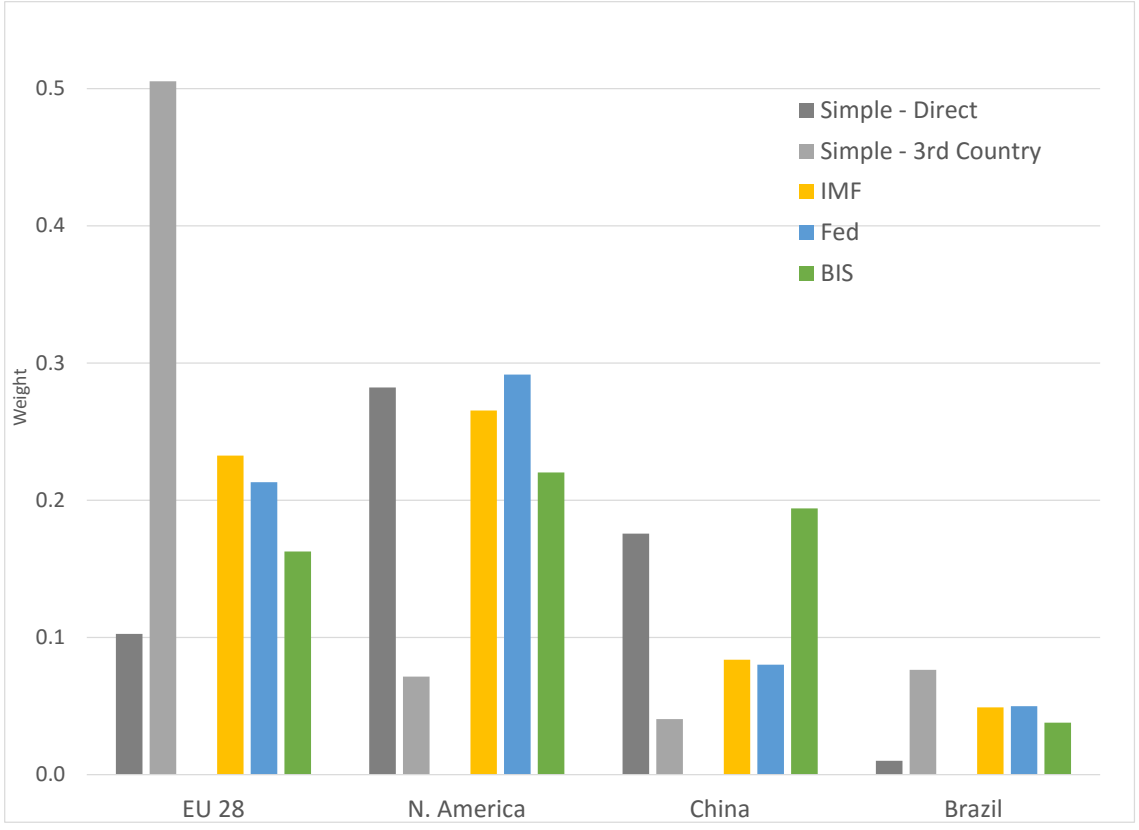
- Total agricultural exports and imports, WTO definition from UN Comtrade via USDA-FAS GATS
  - 2013-15 Average
  - 62 countries
- Agriculture value added, current USD, 61 countries from World Bank
  - 2013-15 Average
  - 61 countries
    - Used in BIS weights only, Taiwan dropped

Comparing weights



- North America and China - large share of U.S. agricultural exports
- EU and Brazil - large share of global agricultural exports

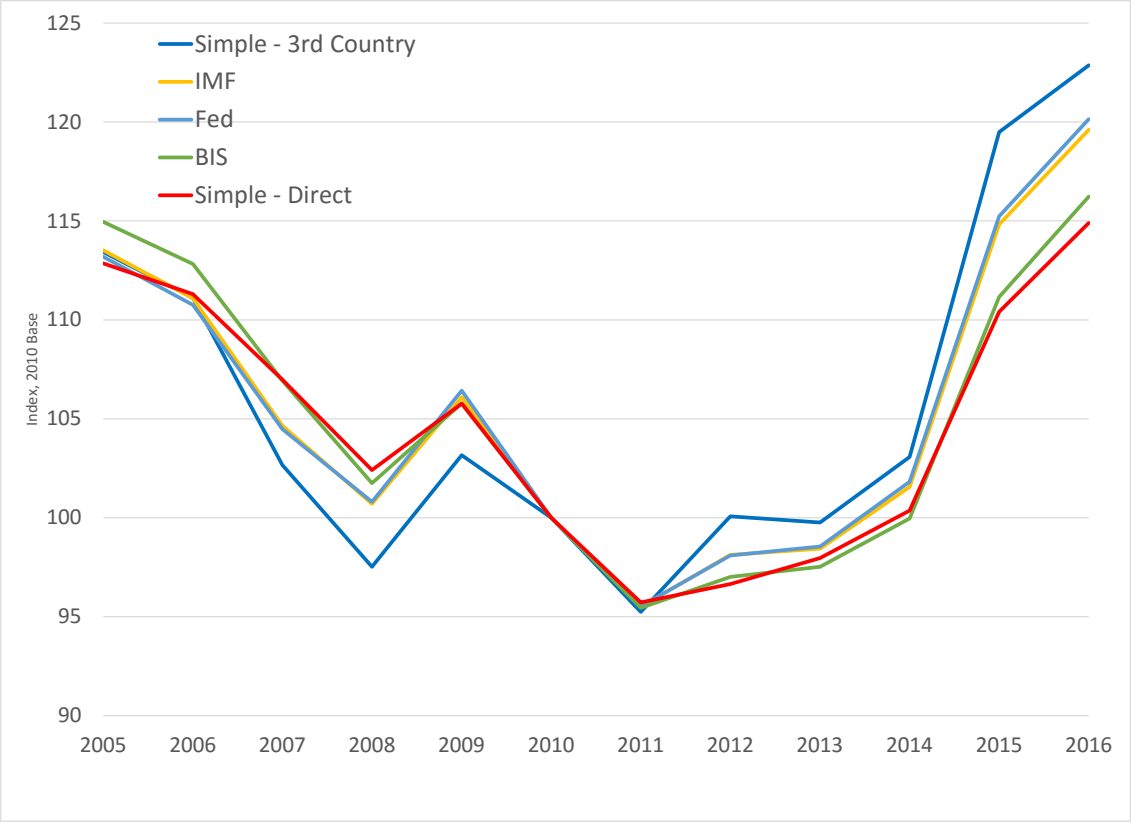
Comparing weights



- Substantial variation across weighting options

▸ Results

Comparing fixed-weight indexes



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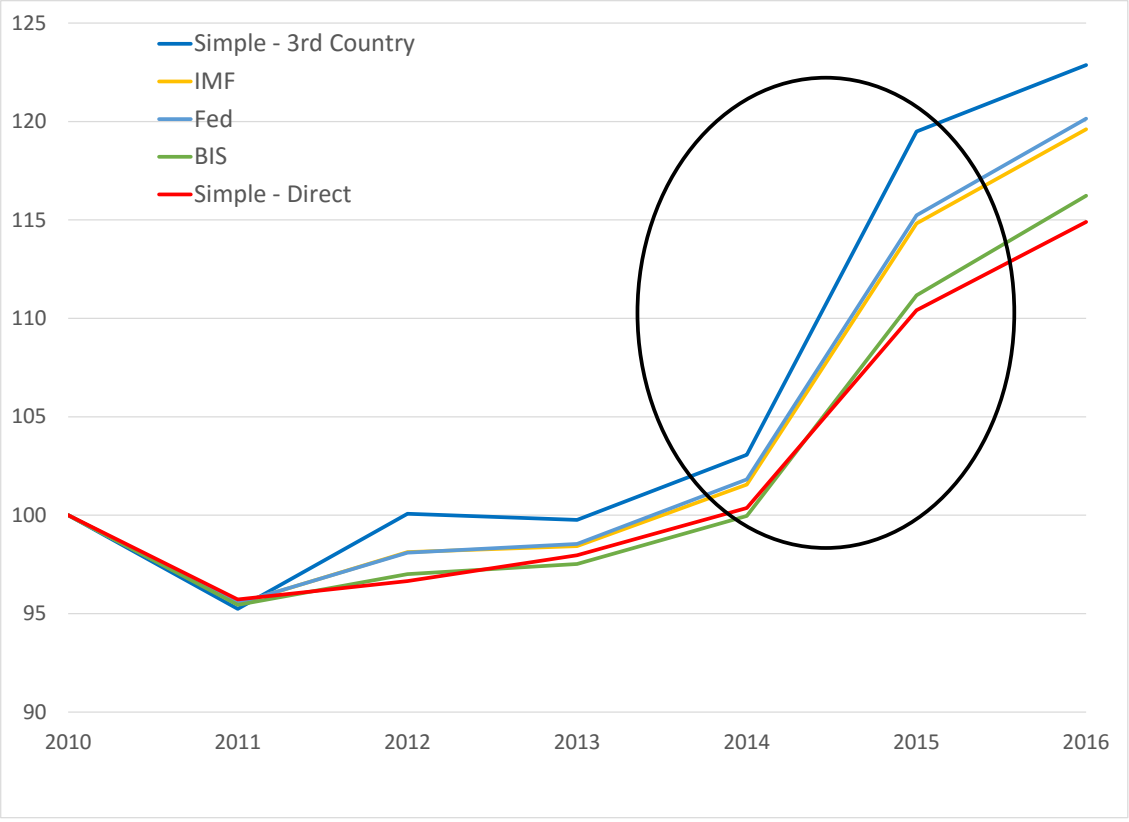

- 2015 appreciation - third country index **+15.9%**, direct index **+10.0%**
  - Real RMB/$ **-0.07%**, Real euro/$ **+19.7%**

Evaluating Indexes

- Compare index ability to explain short-run fluctuations in U.S. agricultural exports

$$\Delta EX_t = \beta_0 + \beta_1 \Delta REER_t + \beta_2 \Delta Y_{t-1} + \epsilon_t$$

  - ΔEX_t - U.S. agricultural exports growth
  - ΔY_{t-1} - Lagged exports-weighted average GDP growth

- Follows Bernard and Jenson (2004), Nie and Taylor (2015), Oxford Economics (2015) as in Cooke et al (2016)

Evaluating Weights: Data

- U.S. exports and GDP data from 62 major trading countries, 1989-2017, indexed to 2010
  - U.S. agricultural exports, WTO definition from USDA-FAS GATS
  - Real GDP from World Bank via USDA-ERS

Results

	Real Effective Exchange Rate Index (REER)				
	Simple - Direct	Simple - 3rd Country	BIS	FED	IMF
Total agriculture	-1.80***	-1.04***	-1.67***	-1.50***	-1.48***
Adjusted R-sq.	0.46	0.42	0.50	0.47	0.47
DW d-stat	2.28	2.04	2.26	1.96	2.04
Bulk products	-2.76***	-1.78***	-2.58***	-2.28***	-2.31***
Adjusted R-sq.	0.36	0.44	0.41	0.37	0.39
Intermediate products	-1.23**	-0.61*	-1.16***	-1.02**	-0.99***
Adjusted R-sq.	0.23	0.14	0.27	0.24	0.23
Consumer Oriented products	-1.17***	-0.52*	-1.02***	-0.98***	-0.93***
Adjusted R-sq.	0.37	0.17	0.36	0.40	0.36

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Next steps

- Explore product and product-type specific weights
- Explore fixed versus time-varying weights