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Identifying Viable Markets for Agricultural Trade: A Global Trade Index Approach

Ivan Lee, Keithly Jones, and Frank Nti

Selected presentation for the International Agricultural Trade Research Consortium's (IATRC's) 2020 Annual Meeting: Economic Implications of COVID-19, December 14-15, 2020, Virtual platform.

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Ivan Lee, Keithly Jones, Frank Nti
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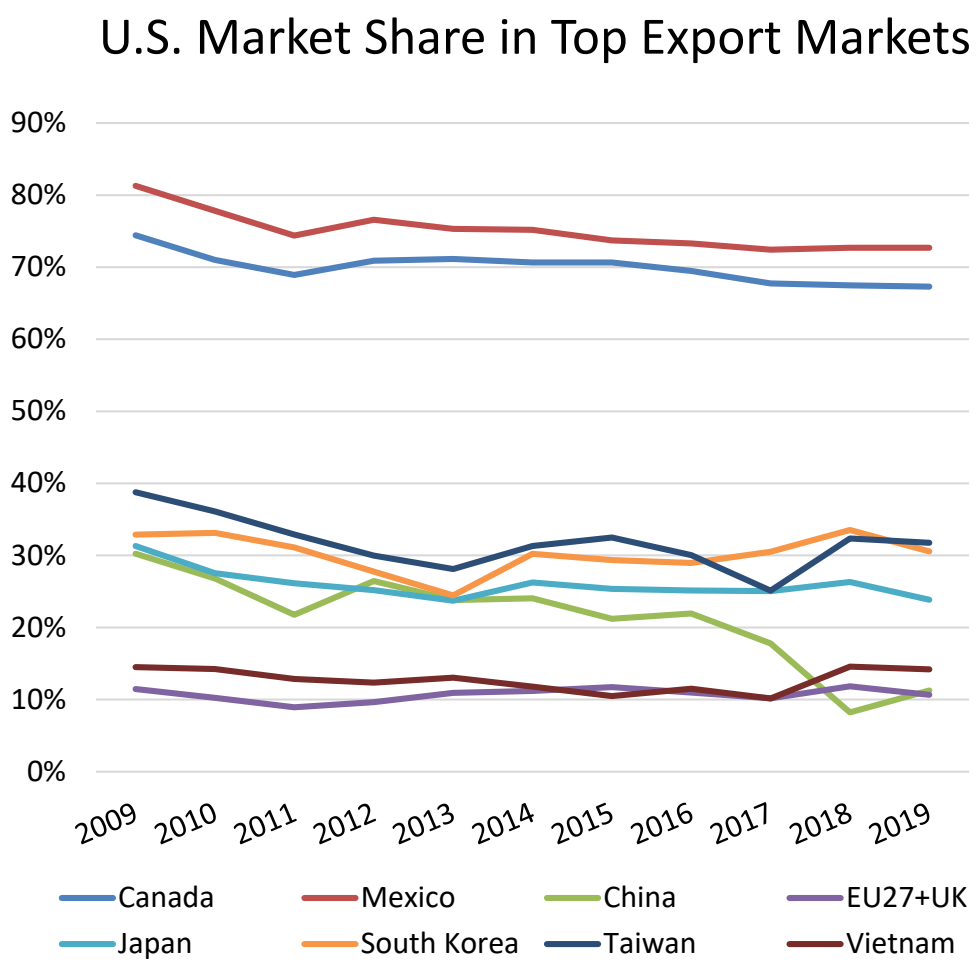
IATRC Annual Meeting, December 2020

** The findings and conclusions in this presentation are those of the authors and should not be construed to represent any official USDA or U.S. Government determination or policy.*

USDA
United States Department of Agriculture
Foreign Agricultural Service

Background



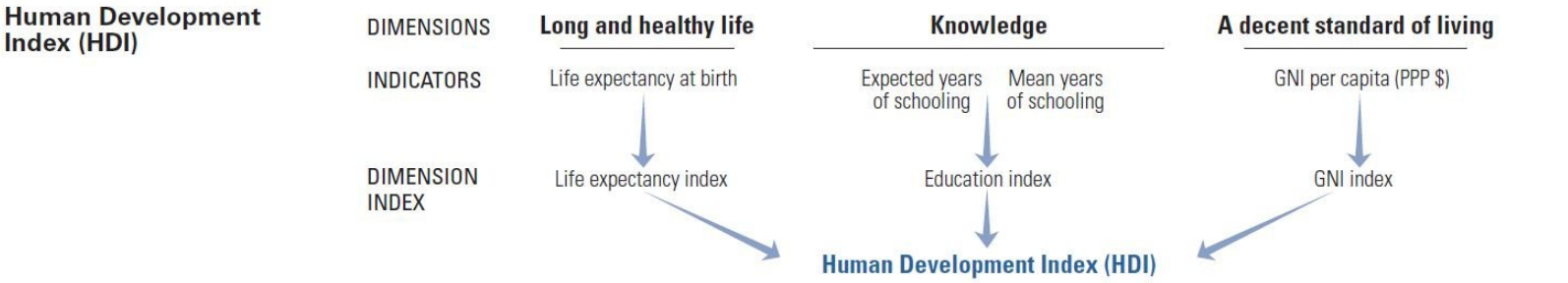
Source: Trade Data Monitor (TDM) BICO-HS6

U.S. Agricultural Exports (CY 2017 - 2019, in Billion Dollars)			
Partner	**2017**	**2018**	**2019**
Canada	20.6	20.9	20.9
Mexico	18.6	19.1	19.2
China	19.5	9.1	13.9
EU27+UK	11.4	13.5	11.8
Japan	11.9	12.9	11.7
South Korea	6.9	8.3	7.5
CAFTA-DR	4.3	4.8	4.8
Taiwan	3.3	3.9	3.6
Vietnam	2.5	4.0	3.5
Hong Kong	4.2	4.0	3.0
ROW	35.0	39.0	36.8
Total U.S. Exports	**138.2**	**139.5**	**136.7**
Top 10 Partners	***74.7%***	***72.0%***	***73.0%***
ROW	***25.3%***	***28.0%***	***27.0%***

Source: USDA FAS Global Agricultural Trade System (GATS) – BICO-HS10

Usage of Composite Index

- Combination of indexes for holistic evaluation
- Human Development Index, Ease of Doing Business Index, World Happiness Report, etc.
  - Policy options and decision-making in a systematized way



Source: United Nations Development Programme

What about for agricultural trade?

Objective

- Develop a global agricultural trade index using:
  - Macroeconomic indicators
  - Technical trade indices
- ***Focus: Identify countries most likely to engage in agricultural trade***

Index Selection

Measurement	Interpretation	Data Source
Agricultural Value of Production	Size of agricultural economy	World Bank (WB)
Population	Market size	WB
Population Growth Rates	Market expansion	WB
GDP Growth Rates	Economic growth, middle-class households to buy imported products	WB
Import Share	Relative competitiveness of U.S. agricultural products	Trade Data Monitor (TDM), USDA/FAS - Global Agricultural Trade System (GATS)
Agricultural Import Penetration	Importance of agricultural imports to a particular trade partner relative to its overall imports	UN Comtrade, TDM
Agricultural Trade Dependence	Importance of agricultural trade to the overall trade profile	UN Comtrade, TDM
Agricultural Tariff Rates	Openness to agricultural trade	International Trade Centre (ITC) Market Access Map

Methodology

- Two-step normalization process
  - Range normalization
    - Each measurement value between [0, 1]
  - Statistical standardization using Z-scores
- Add all Z-scores for an overall score

Scoring Example - Honduras

Measurement	Value	Range Normalization	Z-Score Standardization
Agricultural value of production	$2,616,952,047	0.4 [percentile]	**-0.11**
Population	9,587,522	0.5 [percentile]	**0.28**
Population growth rate	2.13%	0.35 [min-max]	**0.51**
GDP growth rate	4.16%	0.48 [min-max]	**0.18**
Import share	62.8%	0.63 [index formula]	**2.40**
Agricultural import penetration	18.3%	0.18 [index formula]	**0.87**
Agricultural trade dependence	28.0%	0.28 [index formula]	**1.56**
Agricultural tariff rates	11.3%	0.89 [1-tariff rate]	**0.41**
Overall Score for Honduras			**6.10**

Preliminary Results

Rank	Country	Sum of Z-Scores
1	Benin	8.70
2	China	7.60
3	Ethiopia	6.93
4	Yemen	6.75
5	Nigeria	6.16
6	Honduras	6.10
7	Indonesia	5.91
8	Afghanistan	5.78
9	Sudan	5.76
10	Pakistan	5.75
11	Uganda	5.60
12	Gambia	5.43
13	Qatar	5.32
14	Kenya	5.26
15	Guatemala	5.13
16	Rwanda	5.06
17	Bangladesh	5.05
18	Comoros	5.00
19	Niger	4.92
20	Myanmar	4.53

- Sub-Saharan Africa (SSA)
  - **Nine** of the top 20
  - Agriculture-dependent
- High population/growth
  - China, Ethiopia, Nigeria
- "Well-rounded"
  - Honduras, Guatemala, Kenya

Directions for Future Research

- Methodology
  - Index Selection
  - Weighting
- Scope of analysis
  - Regional
  - Commodity-specific

Thank You!

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