



Incorporating State by Country Trade into the WiNDC Database

Alan K. Fox

U.S. International Trade Commission

26th Annual Conference on Global Economic Analysis, Bordeaux

Session 11, June 14, 2023



Disclaimer

Any opinions in this presentation are mine alone, and do not represent either the opinions of the U.S. International Trade Commission, nor any of its individual Commissioners.



Introduction

- The starting point
 - Wisconsin National Data Consortium (WiNDC) database and models
 - Open-source datasets and canonical models of the U.S. economy
 - 50 states + DC, NAICS-4 sectors, US-global trade flows
- The goal
 - Disaggregate state-level trade in the WiNDC database by country trading partner
 - Modify canonical WiNDC model to use new disaggregated trade
 - Conduct baseline simulations using the updated database and model
 - Compare new simulation results to those using the original aggregate data



Why disaggregate state-level trade?

- Not all states trade alike--trade links vary because of
 - Geography
 - History
- Changes in U.S. trade policy aren't always uniform across partners
 - WTO-based multilateral policies were uniform, however...
 - Recent trade policy changes are almost always country-specific
- U.S. regional policy and supply/demand shocks can vary widely



Regional Differentiation: Food, Bev, Tobacco by Rank

Rank	State	RoW	Canada	Mexico	France	Italy	China	Australia	Thailand	U.K.	Indonesia	N. Zealand
1	CA	1	3	2	8	10	4	6	5	14	13	11
2	NJ	1	2	4	5	3	6	7	16	8	9	11
3	IL	3	2	1	7	8	5	6	11	12	28	4
4	NY	1	3	6	2	4	5	13	9	8	21	25
5	TX	2	3	1	5	7	8	13	12	6	30	14
6	FL	1	5	4	3	6	15	14	16	7	21	26
7	PA	2	1	4	7	6	13	3	12	14	9	5
8	GA	1	2	4	6	11	8	22	5	17	3	25
9	WA	2	1	15	8	6	7	4	5	18	12	3
10	MD	1	2	28	9	14	6	31	8	12	3	40
	All U.S.	1	2	3	4	5	6	7	8	9	10	11

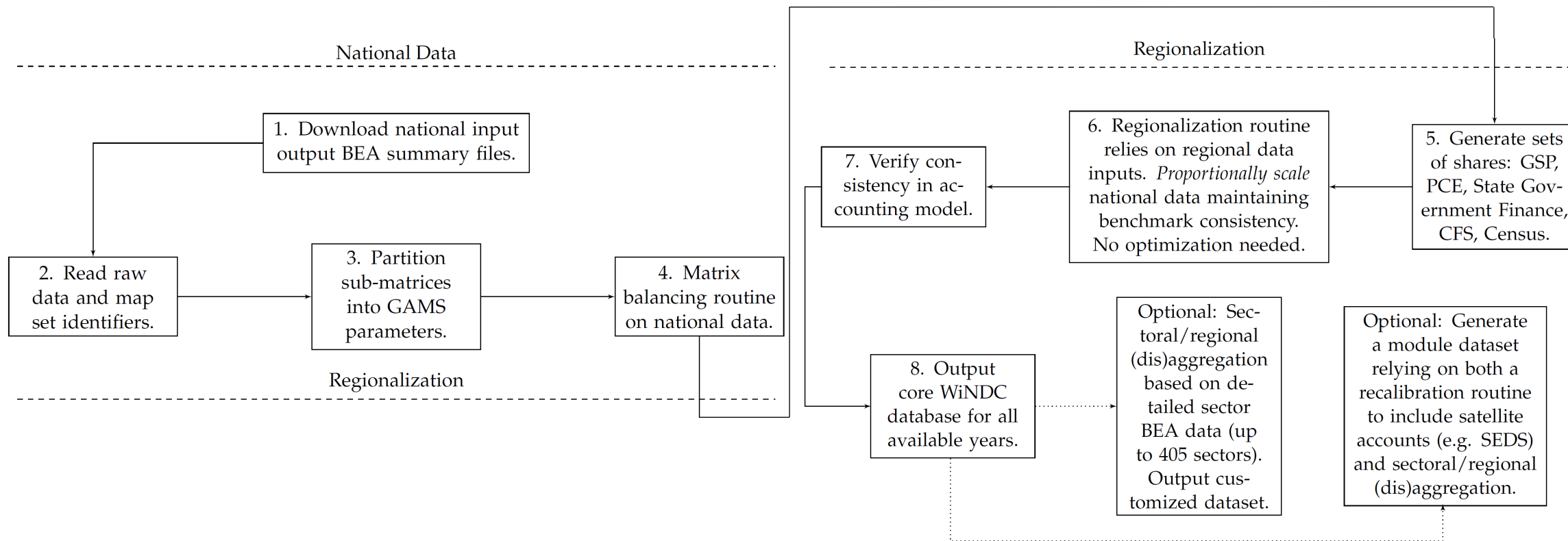


Regional Differentiation: Food, Bev, Tobacco by Percent

Rank	State	RoW	Canada	Mexico	France	Italy	China	Australia	Thailand	U.K.	Indonesia	N. Zealand
1	CA	37.9	11.7	12.2	5.1	4.6	8.2	5.6	5.9	2.0	2.1	4.6
2	NJ	44.3	10.0	8.5	4.9	9.3	4.5	4.3	2.7	4.2	3.8	3.6
3	IL	16.8	20.6	42.1	3.0	2.6	4.2	3.2	1.3	1.3	0.3	4.6
4	NY	33.2	18.6	4.1	20.8	9.4	4.8	1.6	2.2	3.7	0.9	0.7
5	TX	22.7	12.8	44.4	4.7	3.9	2.8	1.3	1.8	4.1	0.3	1.2
6	FL	52.2	7.6	9.5	10.9	6.1	1.9	2.1	1.6	6.0	1.2	0.8
7	PA	26.9	33.8	10.2	2.3	4.2	1.6	11.1	1.8	1.5	2.0	4.7
8	GA	32.6	17.5	12.6	5.7	2.6	4.1	0.9	6.2	1.3	15.4	0.8
9	WA	24.8	42.2	1.4	2.7	5.0	4.0	5.3	5.0	1.3	1.7	6.5
10	MD	57.1	10.6	0.8	4.4	2.7	5.8	0.7	5.0	4.0	8.6	0.3
	All U.S.	33.5	20.1	14.9	6.4	5.5	4.6	3.6	3.0	3.0	2.8	2.8



WiNDC build stream process





WiNDC data sources

Source	Description	ID	URL	Years
Bureau of Economic Analysis	Supply and Use Tables	BEA	https://www.bea.gov/industry/io_annual.htm	1997-2017
	Gross State Product	GSP	https://www.bea.gov/newsreleases/regional/gdp_state/qgsp_newsrelease.htm	1997-2016
	Personal Consumer Expenditures	PCE	https://www.bea.gov/newsreleases/regional/pce/pce_newsrelease.htm	1997-2017
Census Bureau	Commodity Flow Survey	CFS	https://www.census.gov/econ/cfs/	2012
	State Government Finance	SGF	https://www.census.gov/programs-surveys/state/data/tables.All.html	1997-2016
	State Exports/Imports	UTD	https://usatrade.census.gov	2002-2016
Energy Information Administration	State Energy Data System	SEDS	https://www.eia.gov/state/seds/	1963-2016

Notes: Years indicates the *usable* years of available data across data sources. For instance, state level gross product is available for 2017 but has many hidden entries.



Collecting the trade data

- Rely on Census' USATrade Online (<https://usatrade.census.gov/>)
 - Exports and Imports for 50 states + DC
 - NAICS 4-digit
 - 256 countries/territories
 - Beginning with 2017 trade, later extending to other years
 - Necessary to download in 10-state chunks, the merge for WiNDC
 - Export file includes 251,000 observations, imports 211,000 observations



USA Trade Online

USA Trade Online - Reports

usatrade.census.gov/data/Perspec

DC Dictionaries Econ resources Environment

An official website of the United States government

United States[®]
Census
Bureau

File Edit View Tools Help

Public reports My reports My selection sets

Sorted by "Name" in ascending order

- ☐ 2017 AL-FL State Exports by NAICS 4-digit
- ☐ 2017 AL-FL State Imports by NAICS 4-digit
- ☐ 2017 GA-ME State Exports by NAICS 4-digit
- ☐ 2017 GA-ME State Imports by NAICS 4-digit
- ☐ 2017 MD-NH State Exports by NAICS 4-digit
- ☐ 2017 MD-NH State Imports by NAICS 4-digit
- ☐ 2017 NJ-PR State Exports by NAICS 4-digit
- ☐ 2017 NJ-PR State Imports by NAICS 4-digit
- ☐ 2017 RI-WA State Exports by NAICS 4-digit
- ☐ 2017 RI-WA State Imports by NAICS 4-digit
- ☐ 2017 WV-Unknown State Exports by NAICS 4-digit
- ☐ 2017 WV-Unknown State Imports by NAICS 4-digit

File View Help

USA Trade Home --> Data Source Selection --> Report Contents --> Report --> Chart

Report contents

Instructions:
Click on dimension names below to change or edit report contents

Measures
State ☒
Commodity ☒
Country ☒
Time ☒

View as: Table Chart

2017 AL-FL State Exports by NAICS 4-digit

Author: U.S. Census Bureau: Economic Indicators Division USA Trade Online. Source: U.S. Import and Export Merchandise trade statistics. For information on confidentiality protection, nonsampling er

Current date: 06/04/2023 5:01 PM (Eastern Daylight Time)

Measures: Total Exports Value (\$US)

Rows 1-10 of 10 Columns 1-10 of 26,992

Drag dimensions here so they do not show as a row or column in table

Commodity	1111 Oilseeds & Grains									
Country	World Total	Afghanistan	Albania	Algeria	Andorra	Angola	Anguilla	Antigua and Barbuda	Argentina	
Time	2017	2017	2017	2017	2017	2017	2017	2017	2017	
State										
Alabama	209,627,165									
Alaska										
Arizona	48,554,122									
Arkansas	122,892,161								109,516	
California	320,329,351			251,675				27,051	887,589	
Colorado	86,893,542			4,934,143				49,481		
Connecticut	459,287									
Delaware	8,008,531									
Dist of Columbia	24,000									
Florida	24,165,836							126,502	2,994	



Modifying WiNDC Build Stream

- Python tools:
 - Update windc_datastream 2.1 to process state-level data
 - Add country/region dimension to trade data processing
 - Resulting windc_base.gdx data file is passed to next step
- GAMS tools:
 - Update windc_build-3.1
 - Adjust code to accommodate country dimension



State of work

- Scaffolding complete for first part of build
 - Python-based `windc_datastream` produces dataset for balancing step
- Working on GAMS- based `windc_build` module
- Integrate with work by Ed Balistreri (U. Nebraska—Lincoln) on bilateral trade data to account for discrepancies between reported U.S. exports by state and state of production
 - E.g., shipping grain on the Mississippi exaggerates Louisiana's exports
 - Effect of overland shipping also significant



Thank you!

Alan Fox

U.S. International Trade Commission

Alan.Fox@usitc.gov