Trade Flows Analysis Using the BACI Dataset

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Outline

- Introduction of UN Comtrade

- Introduction of Harmonized System Codes

- Introduction of the BACI dataset
  - Construction of BACI
  - Advantages of BACI

- Structure of BACI datasets adapted for trade flow analysis

UN Comtrade (United Nations International Trade Statistics Database)

- The most comprehensive global trade flow database

- Over 170 reporter countries/areas provided to the United Nations Statistics Division (UNSD) for their annual international trade statistics data detailed by commodity categories and trading partner countries

- All traded commodities are converted from national currency to US dollars in value

- With multiple commodity classification systems:
  - Standard International Trade Classification (SITC)
  - Harmonized System (HS)
  - Broad Economic Categories (BEC)

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Harmonized System (HS) Codes

- With full name of the Harmonized Commodity Description and Coding System, which can simply be called the Harmonized System (HS)
  - A standardized international system to classify globally traded commodities (or products)
  - It is the most detailed classification with over 5,000 products at the international level (at 6-digit level)

- Products can be aggregated according to 2-digit, 4-digit and 6-digit codes
  - 6-digit codes have all information for 2-digit and 4-digit codes
  - 4-digit codes have all information for 2-digit codes

- 2-digit codes represent HS chapters, and they appear as first 2-digit codes in both 4-digit and 6-digit codes
  - There are totally 96 HS chapters

10 06 30
···①··· ···②··· ···③···

  - In this example, the first 2-digit code "10" is chapter for "Cereals"

- 4-digit codes represent the combination of HS chapter and heading
  - In this example, the 3rd and 4th digit codes are for heading, "06" is heading for "Rice"

- 6-digit codes represent the combination of HS chapter, heading and sub-heading
  - In this example, the 5th and 6th digit codes are for sub-heading, "30" is sub-heading for "Semi-milled or wholly milled rice"

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Introduction of BACI:
Database for International Trade Analysis (in English)
"**B**ase pour l'**A**nalyse du **C**ommerce **I**nternational" (in French)

- BACI is built from UN Comtrade
  - BACI also made additional efforts in complement to UN Comtrade

Countries report both their imports and their exports to the United Nations. The reported values should match between importer and exporter countries, while in practice, it virtually never happens for two reasons:

1) In general, import values are reported at CIF price (cost, insurance and freight) while exports are reported at FOB price (free on board).

2) More importantly, mistakes are often made, because of uncertainty on the final destination of exports, discrepancies in the classification of a given product, etc...

BACI estimates the CIF costs and subtracts them from the import values reported, so import and export values should be balanced.

BACI hence evaluates the reliability of each country's reporting and assigns different weights to reconcile each bilateral trade flow, such that what country x exports to country y for commodity z is at the same value as what country y imports from country x for commodity z.

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Advantages of Using BACI for Trade Flow Analysis

- A coherent database for a single harmonized value, allowing for international comparison across countries.

- A complete database with more than 200 countries/areas.

- Provides comparable measure in trade volume (all quantity units converted to Metric ton), which allows us to get unit values for traded commodities.

- The data starts in 1998 and the most recent version we downloaded is for 1998 to 2018

- BACI data is annually updated with adjustment also for historical data

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Structure of BACI datasets developed for this project

- Country datasets are in excel files for each country with folder name of this country (e.g., folder "THA" is for datasets of Thailand)

- Four excel files in each country folder:

1. BACI_xxx_partners

2. BACI_xxx_hs2

3. BACI_xxx_hs4

4. BACI_xxx_hs6

- In each excel file, there is a "read me" worksheet that provides definition of all worksheets in this excel file

- In file "BACI_xxx_partners" there are four data worksheets
  - Sheets "e_all" and "m_all" are for all exports and imports including nonagricultural exports and imports aggregated by individual partners
  - Sheets "e_Ag" and "m_Ag" are for agri-food exports and imports aggregated by individual partners

- In files "BACI_xxx_hs2", "BACI_xxx_hs4", and "BACI_xxx_hs6", there is a worksheet for the list of agri-food products, and there are 6 dataset worksheets
  - Sheets "e_all" and "m_all" are for all exports and imports including nonagricultural exports and imports at individual commodity level aggregated to the trade with the world (without individual trade partners identified)
  - Sheets "e_Ag" and "m_Ag" are for agri-food exports and imports at individual commodity level aggregated to the trade with the world (without individual trade partners identified)
  - Sheets "e_ag_partners" and "m_ag_partners" are for agri-food exports and imports at individual commodity level by individual trade partners

Total exports/imports (all commodities together) to/from individual partners
i.e. Worksheets 'e_all', and 'm_all' in Files 'BACI_THA_partners'

*Thailand's total **export** by trading partners*

Export values from 1998-2018, in '000 dollars

	Partners	e1998	e1999	e2018
1	Partners	e1998	e1999	e2018
2	**World total**	**42,428,999**	**58,144,835**	**261,689,127**
216	United States of America	10,454,165	11,670,586	29,262,335
217	Burkina Faso		830	38,840
218	Uruguay	6,205	10,077	30,566
219	Uzbekistan		1,618	17,819
220	Venezuela	6,070	17,375	8,709
221	Wallis and Futuna			803
222	Samoa		1,857	13,504
223	Yemen		58,863	168,754
224	Yugoslavia		4,968	
225	Zambia	1,553	2,539	20,858

*Thailand's total **import** by trading partners*

Import values from 1998-2018, in '000 dollars

	Partners	m1998	m1999	m2018
1	Partners	m1998	m1999	m2018
2	**World total**	**26,734,707**	**43,855,867**	**224,600,143**
216	United States of America	3,067,497	4,529,626	12,872,571
217	Burkina Faso		11,425	3,752
218	Uruguay	3,053	4,312	76,496
219	Uzbekistan		14,478	2,271
220	Venezuela	6,402	10,175	9,172
221	Wallis and Futuna			6
222	Samoa		135	197
223	Yemen		569,747	65,917
224	Yugoslavia		214	
225	Zambia	52,082	54,143	56,685

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Total exports/imports (all Agri-food commodities together) to/from individual partners

i.e. Worksheets 'e_Ag', and 'm_Ag' in Files 'BACI_THA_partners'

*Thailand's total **Agri-food export** by trading partners*

Export values from 1998-2018, in '000 dollars

	Partners	e1998	e1999	e2018
2	**World total**	**10,249,117**	**12,088,040**	**39,947,788**
216	United States of America	2,110,188	2,234,314	3,776,451
217	Burkina Faso		651	22,020
218	Uruguay	1,000	869	4,687
219	Uzbekistan			2,458
220	Venezuela	124	3,627	992
221	Wallis and Futuna			55
222	Samoa		944	3,155
223	Yemen		35,823	113,311
224	Yugoslavia		304	
225	Zambia	188	977	1,933

*Thailand's total **Agri-food import** by trading partners*

Import values from 1998-2018, in '000 dollars

	Partners	m1998	m1999	m2018
2	**World total**	**2,061,269**	**3,060,078**	**16,833,188**
216	United States of America	418,242	456,980	2,325,728
217	Burkina Faso		11,403	3,752
218	Uruguay	928	3,311	6,215
219	Uzbekistan		14,470	308
220	Venezuela	21	1,177	3,206
221	Wallis and Futuna			
222	Samoa			171
223	Yemen		7,716	5,631
224	Yugoslavia			
225	Zambia	2	2,302	360

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Exports to/imports from the world (all partner countries together) at commodity level (for all commodities, including nonAg) at HS 2-, 4-, and 6-digit level

i.e. Worksheets 'e_all', and 'm_all' in Files **'BACI_THA_hs2'**, 'BACI_THA_hs4', and 'BACI_THA_hs6'

Export values from 1998-2018, in thousand dollars

Thailand's export to the world at HS 2-digit level

HS_Description_2dgt	hs96_2dgt	v1998	v1999	v2018	q1998	q1999	q2018
Animals; live	01	60,628	43,160	298,168	18,998	37,002	132,501
Meat and edible meat offal	02	408,935	450,182	1,085,961	210,302	237,248	403,068
Fish and crustaceans, molluscs and other aquatic i	03	2,082,928	2,225,261	1,620,185	506,859	657,485	347,226
Dairy produce; birds' eggs; natural honey; edible pr	04	14,486	45,058	343,678	10,772	43,689	299,549
Animal originated products; not elsewhere specifie	05	41,787	44,498	66,281	31,621	20,821	13,968
Trees and other plants, live; bulbs, roots and the lik	06	54,457	52,357	149,204	9,692	22,094	64,948
Vegetables and certain roots and tubers; edible	07	371,420	498,431	1,285,727	3,243,082	4,578,224	4,303,420
Fruit and nuts, edible; peel of citrus fruit or melons	08	212,753	230,979	2,894,469	322,775	302,711	2,008,480
Coffee, tea, mate and spices	09	131,953	67,317	151,983	112,179	62,702	100,139
Cereals	10	1,445,174	2,030,438	5,909,761	4,119,311	7,133,855	11,551,327

Descriptions of all commodities at HS 2-digit

Export quantities from 1998-2018, in Metric tons

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Exports to/imports from the world (all partner countries together) at commodity level (for Agri-food commodities) at HS 2-, 4-, and 6-digit levels

i.e. Worksheets 'e_Ag', and 'm_Ag' in Files 'BACI_THA_hs2', **'BACI_THA_hs4'**, and 'BACI_THA_hs6'

Export values from 1998-2018, in thousand dollars

Thailand's Agri-food export to the world at HS 4-digit level

HS_Description_4dgt	hs96_4dgt	v1998	v1999	v2018	q1998	q1999	q2018
Wheat and meslin	1001	528	132	741	16	500	130
Rye	1002		12	12		25	3
Barley	1003	96	138	96	154	212	84
Oats	1004	12	31	68	54	234	39
Maize (corn)	1005	12,696	13,504	125,656	97,181	73,150	231,844
Rice	1006	1,431,527	2,012,239	5,773,939	4,021,254	7,043,201	11,308,125
Grain sorghum	1007	232	864	1,007	484	7,113	3,835
Buckwheat, millet and canary seed; other cereals	1008	82	3,517	8,243	167	9,420	7,268
Wheat or meslin flour	1101	1,002	4,655	10,668	2,898	15,008	13,334
Cereal flours; other than of wheat or meslin	1102	24,449	26,065	142,230	62,023	57,184	156,571

Export quantities from 1998-2018, in Metric tons

Descriptions of all Agri-food commodities at HS 4-digit

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Exports to / imports from **individual partner** countries **at commodity level** for agri-food commodities at HS 2-, 4-, and 6-digit levels

i.e. Worksheets 'e_ag_partners', and 'm_ag_partners' in Files 'BACI_THA_hs2', '**BACI_THA_hs4**', and '**BACI_THA_hs6**'

Thailand's Agri-food export to individual partner at HS 6-digit level

Export values from 1998-2018, in thousand dollars

1	importer	HS_Description_6dgt	hs96_6dgt	v1998	v1999	v2018	q1998	q1999	q2018
80664	South Africa	Cereals; husked (brown) rice	100620	700	30	854	3,010	116	4,077
80665	Zambia	Cereals; husked (brown) rice	100620			10			6
80666	Zimbabwe	Cereals; husked (brown) rice	100620						
80667	Aruba	Cereals; rice, semi-milled or wholly milled	100630			62			49
80668	Afghanistan	Cereals; rice, semi-milled or wholly milled	100630						
80669	Angola	Cereals; rice, semi-milled or wholly milled	100630		2,732	157,273		10,850	425,818
80670	Anguilla	Cereals; rice, semi-milled or wholly milled	100630						
80671	Albania	Cereals; rice, semi-milled or wholly milled	100630			783			1,654
80672	Andorra	Cereals; rice, semi-milled or wholly milled	100630	8			16		
80673	Netherland A	Cereals; rice, semi-milled or wholly milled	100630						
80674	United Arab	Cereals; rice, semi-milled or wholly milled	100630		55,364	32,792		212,353	79,092
80675	Argentina	Cereals; rice, semi-milled or wholly milled	100630	21	36	17	46	164	21

Descriptions of all Agri-food commodities at HS 6-digit, more specific than at HS 4-digit, i.e. rice

Export quantities from 1998-2018, in Metric tons

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Thank you!

The list of Agri-food commodities

hs96_2dgt	HS_Description_2dgt
01	Animals; live
02	Meat and edible meat offal
03	Fish and crustaceans, molluscs and other aquatic invertebrates
04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included
05	Animal originated products; not elsewhere specified or included
06	Trees and other plants, live; bulbs, roots and the like; cut flowers and ornamental foliage
07	Vegetables and certain roots and tubers; edible
08	Fruit and nuts, edible; peel of citrus fruit or melons
09	Coffee, tea, mate and spices
10	Cereals
11	Products of the milling industry; malt, starches, inulin, wheat gluten
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit, industrial or medicinal plants; straw and fodder
13	Lac; gums, resins and other vegetable saps and extracts
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included
15	Animal or vegetable fats and oils and their cleavage products; prepared animal fats; animal or vegetable waxes
16	Meat, fish or crustaceans, molluscs or other aquatic invertebrates; preparations thereof
17	Sugars and sugar confectionery
18	Cocoa and cocoa preparations
19	Preparations of cereals, flour, starch or milk; pastrycooks' products
20	Preparations of vegetables, fruit, nuts or other parts of plants
21	Miscellaneous edible preparations
22	Beverages, spirits and vinegar
23	Food industries, residues and wastes thereof; prepared animal fodder
24	Tobacco and manufactured tobacco substitutes
3502	Albumin powder
4001	Natural rubber
41	Raw hides and skins (other than furskins) and leather
4301	Raw furskins
50	Silk
51	Wool, fine or coarse animal hair; horsehair yarn and woven fabric
52	Cotton
53	Vegetable textile fibres; paper yarn and woven fabrics of paper yarn

- Most Agri-food commodities can be identified at chapter level, i.e., at HS 2-digit level with few exceptions.
- The list of agri-food commodity shown here is available in HS 2-digit dataset file with a worksheet named 'AgFoodList'.
- More detail agri-food commodity lists at HS 4-digit and HS 6-digit are also available in their dataset files.

Three exceptions of agri-food products have to be identified at 4-digit level, because the other commodities in the same chapter are not Agri-food commodities.

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Dessert (weekly assignment)

- Is your country a net importer or exporter of total agri-food trade in the period of 2014 to 2018?
- Which countries are the top 10 trading partners for your country in terms of total agri-food export and total agri-food import values according to the average of 2014-2018?
    - Calculate the total agri-food import value for each of these top 10 countries for average 2014-2018
    - Calculate the total agri-food import value for each of these top 10 countries for average 1998-2002
    - Calculate the shares of each of those top-10 import partners in your country's total agri-food exports for 2014-2018
    - Calculate the shares of each of those top-10 import partners in your country's total agri-food exports for 1998-2002
    - Create a table in excel sheet with 10 rows and four columns for the above information with top-10 countries' names
- What are the top 10 exported agri-food commodities at HS 4-digit level for your country in 2014-2018 average?
    - Calculate the export value of each of top-10 commodities for average 2014-2018
    - Calculate the export value of each of top-10 commodities for average 1998-2002
    - Calculate the shares of each of those top-10 export commodities in total agri-food export value for 2014-2018
    - Calculate the shares of each of those top-10 export commodities in total agri-food export value for 1998-2002
    - Create a table in excel sheet with 10 rows and four columns for the above information with top-10 commodity HS 4-digit codes and description