Correlates of War Project Trade Data Set Codebook, Version 4.0

1870-2014

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Introduction

This guide provides a summary of the procedures used to update the Correlates of War Project's Trade Data Set from Version 3.0 to the current Version 4.0. The data are available at the COW website: http://correlatesofwar.org. Version 3.0, released in 2012, covered the period 1870-2009. The current version covers the period 1870-2014. In additional to expanding the temporal domain of the time series data, the latest version includes revisions and expansions to earlier years of the data set. We discuss the data and the procedures for the update below. We highly recommend that you read Barbieri, Keshk, and Pollins (2009) to understand the basis for our decision rules. Also, if you use the data, please cite the following sources:

> Barbieri, Katherine and Omar M. G. Omar Keshk. 2016. Correlates of War Project Trade Data Set Codebook, Version 4.0. Online: http://correlatesofwar.org.
>
> Barbieri, Katherine, Omar M. G. Keshk, and Brian Pollins. 2009. "TRADING DATA: Evaluating our Assumptions and Coding Rules." *Conflict Management and Peace Science*, 26(5): 471–491.

The data set includes annual dyadic and national trade figures for sovereign states within the international system, as defined by the Correlates of War Project. The data set contains three data files: (1) dyadic trade statistics, named dyadic_trade.csv) (2) national trade statistics, named national_trade.csv; and (3) this Codebook.[1] The data are in text format, with variables separated by commas. Variable names, procedures, source codes, and descriptive statistics are provided below for each data file.

Please be warned that the number of observations in the dyadic trade data file exceeds the number of observations handled by Excel. Many computers set Excel as the default program to open files with a "csv" extension. We recommend that users import the text file directly into a statistical program or into Microsoft Access for data management.

Changes to Version 4.0

To complete the revisions, we divided the dataset into two periods: 1870-1959 and 1960-2014. We adopted the same decision rules used in the past and across periods. The earlier years required more steps, because trade values reported in local currency had to be converted to US dollars;

Table 1. Variables in the Correlates of War (COW) Trade Data Set, Version 4.0

Variable	Description
ccode1	COW Country Code for State A
ccode2	COW Country Code for State B
year	Observation year

[1] A separate set of supplementary files is available that contains raw data and notes for the pre-WWII period.

importer1	Name of country A
importer2	Name of country B
flow1	Imports of Country A form Country B, in US millions of current dollars
flow2	Imports of Country B from Country A, in US millions of current dollars
smoothflow1	Smoothed Flow1 values
smoothflow2	Smoothed Flow2 values
smoothtotrade	Smoothed total trade values (obtained by first summing Flow1 and Flow2 and then applying smoothing).
spike1	Indicator variable, with 1 equal to changes in flow1 value between period *t* and *t+1* exceeding 50%.
spike2	Indicator variable, with 1 equal to changes in flow2 value between period *t* and *t+1* exceeding -50%.
dip1	Indicator variable, with 1 equal to changes in flow1 trade value between period *t* and *t+1* exceeding -50%.
dip2	Indicator variable, with 1 equal to changes in flow2 trade value between period *t* and *t+1* exceeding -50%.
trdspike	Indicator variable, with 1 equal to changes in total trade value between period *t* and *t+1* exceeding 50%.
tradedip	Indicator variable, with 1 equal to changes in total trade value between period *t* and *t+1* exceeding -50%.
source1	Source of data for flow1 variable (see table below)
source2	Source of data for flow2 variable (see table below)
China_alt_ Flow1	Original figures for the People's Republic of China (see notes below)
China_alt_ Flow2	Original figures for the People's Republic of China (see notes below)
Bel_Lux_alt_ Flow1	Original Belgium and Luxembourg trade values (see notes below)
Bel_Lux_alt_ Flow2	Original Belgium and Luxembourg trade values (see notes below)
version	Data version = 4.0

Procedures for obtaining and reporting data

First, Keshk created a program to generate a list of all possible dyads and nation-state years in the international system, using the Correlates of War Project's (2015) State System Membership Data. We refer to the respective dyadic and monadic data files as "Master Files." We entered the data into the matrix through a series of procedures described below. For the pre-WWII period, additional files were used to obtain and compare trade and exchange rate data and transform foreign currencies into US dollars.

The majority of the post-WWII data were obtained from the International Monetary Fund's (IMF) Direction of Trade Statistics (DOTS), which was downloaded from the IMF's website in October of 2015. The DOTS contains extensive notes about the trade data and specific country notes. (We encourage scholars conducting small *N* or case study research examining the IMF's supplementary materials to deal in a more concentrated manner with data coverage issues).

We downloaded import and export data from IMF's Direction of Trade Statistics. This produces import and export files that are organized by pairs of economic entities. The names of the entities include state and non-state actors. Keshk wrote a program to reconfigure the data to resolve inconsistencies across the IMF and COW system members. IMF names are converted to COW Country Codes. This is a complex process since the IMF uses multiple names, spellings, and mixed case combinations for the same country or economic entity. Sometimes the specific name used is a product of the reporting state's name usage; at other times, name variations correspond to the changes in the composition of members in the international system because states or entities might be divided, united, born, dissolved, etc. In some cases, the IMF includes a state for a longer period of time than the state exists as a sovereign entity, but it only assigns data to those years in which it was in existence. For example, the IMF includes the USSR in its database for the period 1948 until 2006; the Russian Federation from 1980 to2006, and "Russia" from 1980 to2006.[2] The problem of multiple names is compounded when one state reports Russia to be its partner and another state lists the Russian Federation as its partner. Typically, Russia uses that term to refer to its imports and exports to other states, but other states tend to use the term Russian Federation.

We identified similar problems with multiple or changed names for Yugoslavia and Serbia & Montenegro, Korea and South Korea, Germany and West Germany, and Yemen and the Yemen Arab Republic. In each case, we isolated those countries and ensured that the appropriate data were recorded for the proper entity in the appropriate year. We made sure our state list corresponded with the COW state membership list. The same procedure was applied when we compared our data to Hicks' data from 1919-1949. We discuss this below. His data also includes non-state entities and reports of trade flows (for both the importing and exporting state).

The IMF data set includes an entry for a given state's imports to and exports from a given trade partner. The IMF data include, but are not limited to, sovereign states, non-state territories, regional trading groups, geographic regions, the level of development grouping (e.g., developing states), and "the world." At this stage, the dyadic data for each observation consists of a given state matched with a given partner. For the national figures, each observation focuses on a certain

[2] The USSR was dissolved on 26 December 1991. The Russian Federation was established on 25 December 1991, just one day earlier.

state matched with the world (i.e., imports from the world and exports to the world). We advise against using the dyadic data file to produce any national or global totals, based on aggregations of the partner trade. With the IMF and other sources, portions of the total trade will not be attached to any given partner and may be aggregated to a group or region. The IMF reports regional and global trade figures for those interested in those levels of analysis. At this stage, we have a list of directed dyads, where each state reports its imports from and exports to another state.

Next, we match the reports of the importer and exporter. For any directional flow of trade between two states (e.g., East to West flows, or North to South flows), the importer and exporter should both report a given trade flow value. We then have two flows, Flow 1 and Flow 2. For each of these flows, the importer and exporter both report a value in their respective national trade statistics provided to the IMF. We match the importing and exporting state's reported value of Flow 1, then the importing and exporting state's reported value of Flow 2 matching the importer

From the directed dyadic dataset, we generate a non-directed dyadic data set. In each case, two states report the same flow of goods in one direction. Thus, we have two states reporting Flow 1 and Flow 2. This gives us four trade values for the undirected dyad: Flow 1, Importer Report (IR); Flow 1, Exporter Report (ER); Flow 2, Importer Report (IR); and Flow 2, Exporter Report (ER). The data are arranged, so the lower number in the COW country list appears in the first column when data for Flow 1 and Flow 2 are merged. For example, the US-Canada dyad in 1989 would have one row, with four trade flows, Flow1_IR would report the imports of the US from Canada as indicated by the US, Flow2_IR would report the imports of Canada from the US as reported by Canada. Flow1_ER would be the exports of Canada to the US as reported by Canada and Flow2_ER would be the exports of the US to Canada as reported by the US.

The IMF data set contains many missing data codes. After utilizing the IMF importing state's inflow data report, we substituted missing values for Flow 1 (IR) with the exporting state's report for the same flow, Flow 1 (ER). We also relied upon the exporter's report when the importing state reported zero trade and the exporter reported trade values.

Once we had filled in all the data available from the IMF's data published online, we used data from COW Trade Dataset Version 3.0. We followed the same decision rules listed above when we created that version of the data set. The majority of the post-World War II data in Version 3.0 were obtained from The IMF's CD-ROM, monthly subscription of the Direction of Trade Statistics and the DOTS Historical Data for 1948-1980. Version 3.0 also integrated data from IMF tapes (1996) and from Barbieri Version 1 (2002, Appendix A).

Special Cases

There were a few special cases described in Version 3.0's Codebook, where IMF data were missing for some states for early years of the post-WWII Period. In those instances, we relied on the United Nations Yearbook of International Trade Statistics (1951-1984), APEC Study Center City University of Hong Kong Data Bank (2004), and ROC's Council for Economic Planning and Development (2002, 2004). For the years 1989-2009, data were obtained from the ROC's Bureau of Foreign Trade.

Until 1996, the IMF reported one aggregate figure for Belgium and Luxembourg's trade

activities. For the pre-1996 values, we include the IMF's original values, as a separate variable. The standard flow values contain estimates of disaggregated data based on the relative size of the GDP of each country. To disaggregate the Belgium-Luxembourg combined reports, we first obtained the nominal GDP for Belgium and Luxembourg, respectively (World Bank, 2005). We generated a ratio value of the smaller to higher GDP values (i.e., Luxembourg to Belgium). We multiplied Luxembourg's dyadic trade figure by this ratio to produce its trade values. For Belgium, we multiplied the total trade figures by one minus the ratio value above. The original figures were placed in separate columns in our data set (i.e., Bel_Lux_alt_ Flow1 and Bel_Lux_alt_ Flow2). While this is not an ideal solution for disaggregating the trade figures, we would recommend using the adjusted figure rather than the same figure for Belgium and Luxembourg's trade.

The trade figures for Hong Kong and Macao have been and continue to be reported separately from those of Mainland China, despite the return of these territories to PRC control in 1997 and 1998, respectively. We combined these figures to produce our measures for China's trade. Once again, we include the original figures in separate columns in our data set (China_alt_ Flow1 and China_alt_ Flow2).

Few scholars address the issue of how to handle data for Hong Kong, Macao, and China. International organizations, like the IMF, often report economic figures for these geographic areas separately. Given that we are interested in sovereign states in International Relations, we believe Hong Kong and Macao's trade data should be included for the state of China for years that they are recognized as part of China. China still has ultimate control over its territories, despite any "special" status.[3] For example, Hong Kong—part of China—was recently ranked number one in the Frasier Institute's (2015) Economic Freedom of the World data set. Despite the special status of Hong Kong, China's political control over Hong Kong has led to a downgrading to the credit scores in the last year.

Pre-World War II Data

Version 4.0 of the trade data incorporates data from Version 3.0 but also includes revisions and expansions to the data set.[4] The revisions to the national and dyadic versions of the pre-World War II data were completed separately, beginning with the national trade data file. We are extremely grateful to Raymond Hicks and Joanne Gowa of Princeton University for sharing trade and exchange rate data with us. Our figures are not always identical to those used in Gowa and Hicks (2015), due to our reliance on alternative exchange rates in some cases where Hicks's trade data was used.

For the national trade data file, we compared our earlier trade and exchange rate figures with newly published data from the United Nations (2015). The UN historical data reports League of Nations data, which includes trade and exchange rate data. The League of Nations was one of many sources of data used in earlier versions of the dataset. Barbieri (1998) collected data that were often reported in local currency values and converted these data to US dollars with multiple exchange rates. In this version, we replaced the local currency values from Version 3.0

[3] The "umbrella revolution" reminds us that Hong Kong is still part of China.

[4] Version 3.0 of COW Trade Data Set includes pre-WWII data from Barbieri's International Trade Database Version 1.0 (1998, see Barbieri, 2002, Appendix A).

with US dollar trade values from the UN, when available.

We also compiled exchange rate data from the UN, reported regarding the number of US cents per one unit of local currency. We transformed the data, so they were expressed regarding the number of local currency per 1 US dollar. Supplementary files contain currency names and exchange rates for the currency in which data were collected (dc) and for the local currency (lc) since these were not always the same. For example, if we relied upon the exporting state's trade value, we may have been able to collect new data for the importing state's local currency. Here, the data collection currency may correspond to the exporting state's local currency. In cases where one state uses multiple currencies to reporting different trade flows, we calculate the transformations for import and export values separately and enter the transformed US dollar values in Version 4.0 of the data.[5]

For the national trade figures, we also compared our earlier exchange rate values to new data compiled by the United Nations (2015), Officer (2015), and Hicks (2015). In cases where our original exchange rates varied from the general trend in the data, we replaced the exchange rate value, using the following preference ordering: the United Nations (2015), Barbieri (2002), Officer (2015), and Hicks (2015).[6] We merged our new exchange rate values into the dyadic data provided by Hicks. Here, we transformed Hicks trade values reported in local currency into US dollars using two exchange rate values—Hicks mixed collection and our new exchange rate. We refer to the trade data values derived from both Hicks trade and exchange rate values as "Hicks data." We refer to trade values, in US dollars, produced using Hicks trade data and alternative exchange rates sources as "Hicks revised data." We include codes for each of these in the table below:

Table 2. Sources and Corresponding Codes for bilateral trade data

Code	Sources
-9	Missing data
1	Barbieri Version 1 (see 2002; Appendix A)
2	Hicks (2015) Imports of State A from State B, Importer's report
2.01	Revised Hicks Imports (Hicks Trade, Alternative exchange rates)
2.1	Hicks (2015) Exporter's report of Flow 1
2.11	Revised Hicks Exporter's report
3	IMF import reports (2015)
4	Missing import values replaced with IMF exporter's trade figure
5	Zero trade values replaced with the IMF's exporter's trade (2015)
6	Missing Cow 4.0 values replaced with COW 3.0 data

[5] Users interested in specific trade values should examine whether multiple exchange rates were in use in one of the states in the dyad.

[6] Hicks also relies on multiple exchange rate sources to convert trade values to US dollars.

Table 3. National Trade Data Set Variables

Variable	Description
ccode	Correlates of War Country Code
country	Name of country
year	Observation year
imports	Total Imports of Country in current US millions of dollars
exports	Total Exports of Country in current US millions of dollars
source1	Source of data for imports variable (see Table 2)
source2	Source of data for exports variable (see Table 2)
alt_imports	Original People's Republic of China total import values and Belgium/ Luxembourg total import values (see discussion above)
alt_exports	Original People's Republic of China total export values and Belgium/ Luxembourg to0tal export values (see discussion above)
version	Data version = 4.0

Table 4. Sources and Corresponding Codes

Code	Sources
-9	Missing data
1.1	Belgium/ Luxembourg total import values (see discussion above)
2	IMF 2015 trade values
2.2	Missing and zero values replaced with cow 3.0 data
3	Missing values replace with reported World Values
4	Zero values replaced with missing values

Missing Data

There are weaknesses with most solutions scholars propose to handle missing data (Barbieri, Keshk, & Pollins 2007; 2009b; Barbieri & Keshk, 2011).[7] We do not equate an absence of trade data with an absence of trade. Our hope is that scholars interested in trade or who compile economic data will cooperate to generate and share trade data to fill in the missing data and investigate inconsistent trade reports. There are far more issues that must be resolved with trade data that will only be achieved with coordinated and collaborative efforts for scholars interested in questions that exist in the data. We record a zero trade value only in places where published data or reports contain that value.

[7] We have discussed this at length in our earlier publications.

Dramatic Fluctuations in Trade Values

Users who wish to use these trade data in a time-series or cross-sectional time-series designs need to be aware that in some instances, there are dramatic upward or downward changes from one year to the next in the value of trade reported within a dyad.

We explored the sources of dramatic variation in the trade values from one year to the next to be sure that data were not the result of errors in reporting to the source or compiling data for our files. The observations in this dataset are consistent with the values published by the IMF. We do not find it unusual for trade values to vary from one year to the next, particularly if a dramatic event is occurring in a given state, relationship, or environment. Elsewhere, we have argued against applying standard fixes to alter variations in the data and encourage scholars to investigate the source of the trends that appear in published data. Unfortunately, the dramatic changes in trade values create problems for scholars using this trade data set for pooled cross-sectional time series analysis. For this reason, we conform to COW practices and adjust the trade data to remove spikes and dips. Our data set includes our original data, as well as the smoothed data calculated by Zeev Maoz.[8] Users will have to decide which values to use.

We also compared our dyadic trade data to commodities trade data used by some scholars in International Relations. We were able to do this with the help and cooperation of Timothy M. Peterson, who has worked with COW and commodities trade data, and shared his commodity data with us.[9] Peterson conducted a series of analyses to compare dyadic trade flow values in the COW Trade Dataset, Version 3.0 with the aggregate value of all commodities traded within a dyad. He found a near perfect correlation between observations in trade values and his and changes in trade values across the two data sets.

Omar Keshk later conducted a similar analysis, using COW Trade Data Version 4 and Peterson's aggregate commodities data by dyad covering the period 1962-2010. We merged Peterson's data into COW 4.0, dropping all observations that were not present in both Cow 4.0 and the Commodities data. The resulting dataset contained 367,272 observations.

Next, we generated two variables for the percentage change in trade flows, one for Flow 1 and one for Flow 2 of the dyadic trade data set. Using the same country code, we generated two variables for the percentage change in commodities from time *t* to time *t+1*. The commodities data report exports from state A to state B and exports from state B to state A, the opposite of our trade flow configuration This meant that the percent change for COW Flow 1 needed to be compared to aggregate commodities flows from state B to state A, and that COW Flow 2 had to be compared to the percentage changes in commodities s from state A to state B.

General Summary of Findings for the Comparison of Peterson's (2016) Commodity Data and COW 4.0 Dyadic Data:

1. The number of COW Flow 1 values that were equal to zero is: 59,222
2. The number of COW Flow 2 values that were equal to zero is: 65,482
3. The number of Commodity Flow 1 values that were equal to zero is: 75,445

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[8] Zeev Maoz wrote a program adjusted trade figures in instances of spikes or dips. See Appendix for summary of observations.

[9] See Peterson (2017), for information about his commodities trade data. The data were provided in personal communications in 2016.

4. The number of Commodity Flow 2 values that were equal to zero is: 103,765
5. The number of observations for change in Flow 1 of the COW dyadic trade data that exceeds 100% is 45,730 out of 254,783. For the Commodities flows from A to B, the number of observations that exceed 100% = 48,274 out of 251,751.
6. The number of observations for change in Flow2 of the COW dyadic trade data that exceeds 100% is 45,814 out of 248,661. For Commodities flows from B to A, the number of observations that exceed 100% = 44,560 out of 225,282.

We conducted further analysis to see if the jumps in dyadic trade flow values coincided with jumps in Peterson's aggregate commodity trade flow values:

1. There were 8,089 observations in which COW Flow 1 values (dyadic trade) jumped by more 100% while simultaneously Commodity Flows A to B jumps were less than 100%.
2. There were 7,782 observations in which Commodity Flows A to B (Commodity data) jumped by more than 100%, while the same flow in COW data observed jumps by were less than 100%.
3. There were 6,951 observations in which COW Flow 2 values jumped by more 100%, while the Commodity Flows B to A jumps was less than 100%.
4. There were 7,149 observations in which Commodity Flows B to A jumped by more 100%, while Flow 2 of COW's dyadic trade had jumps less than 100%.
5. There were 38,152 observations in which COW Flow 1 values (dyadic trade) had no zero values, while Commodity Flow A to B jumps was equal to zero.
6. There were 29,341 observations in which COW Flow 1 values (dyadic trade) were equal to zero values while simultaneously Commodity Flow A to B jumps was not equal to zero.
7. There were 29,881 observations in which COW Flow 1 values (dyadic trade) and Commodity Flow A to B were simultaneously equal to zero.
8. There were 54,511 observations in which COW Flow 2 values (dyadic trade) had no zero values while simultaneously Commodity Flow B to A was equal to zero.
9. There were 27,192 observations in which COW Flow 2 values (dyadic trade) were equal to zero values while simultaneously Commodity Flow B to A was not equal to zero.
10. There were 38,290 observations in which COW Flow 2 values (dyadic trade) and Commodity Flow B to A were simultaneously equal to zero.
11. There were 29,881 observations in which COW Flow 1 values (dyadic trade) and Commodity Flow A to B were simultaneously equal to zero.
12. There were 7,149 observations in which Commodity Flows B to A jumped by more 100% while simultaneously Flow two dyadic trade jumps were less than 100%.

References

APEC Study Center, City University of Hong Kong Data Bank. 2004. http://fbweb.cityu.edu.hk/hkapec/DataBank/Taiwan-Trade-Balance.pdf

Barbieri, Katherine. 2002. *The Liberal Illusion: Does Trade Promote Peace?* Ann Arbor, University of Michigan Press.

Barbieri, Katherine, and Omar M. G. Keshk. 2011. "Too Many Assumptions, Not Enough Data." Conflict Management and Peace Science 28(2): 168–172.

Barbieri, Katherine and Omar Keshk. 2012. Correlates of War Project Trade Data Set Codebook,

Version 2.1. Online: http://correlatesofwar.org.

Barbieri, Katherine and Omar Keshk. 2009a. Correlates of War Project Trade Data Set Codebook, Version 3.0. Online: http://correlatesofwar.org.

Barbieri, Katherine, Omar M. G. Keshk, and Brian Pollins. 2009b. "TRADING DATA: Evaluating our Assumptions and Coding Rules." *Conflict Management and Peace Science*, 26(5): 471–491.

Barbieri, Katherine and Omar Keshk. 2012. Correlates of War Project Trade Data Set Codebook, Version 3.0. Online: http://correlatesofwar.org.

Barbieri, Katherine, Omar Keshk, and Brian M. Pollins. 2003. "The Correlates of War Trade Data Set: A Progress Report." Paper presented at the Annual Meeting of the Peace Science Society (International), Ann Arbor, Michigan, November 13-16.

Board of Governors of the Federal Reserve System (U.S.) 1935-. "Section 11: Currency," Banking and Monetary Statistics, 1914-1941 (Part I): 403-420. https://fraser.stlouisfed.org/scribd/?toc_id=334470&filepath=/docs/publications/bms/1914-1941/BMS14-41_complete.pdf&start_page=#scribd-open Accessed November 3, 2015.

Correlates of War Project. 2015. "State System Membership List." Online, http://correlatesofwar.org.

Fraser Institute. 2015. Economic Freedom of the World 2015 Annual Report. http://www.freetheworld.com/release.html. Accessed November 29, 2015.

Gowa, Joanne, and Raymond Hicks. 2015. "Politics, Institutions, and Trade between the Wars: New Data and Conventional Wisdom." International Organization. International Organization 67(1): 439-467. Replication data. http://www.princeton.edu/~rhicks/papaers/gowa_hicks_io.zip)

Hicks, Raymond. 2015. Personal communications, including email and phone calls. The data used were provided in October 2015. Please see http://www.princeton.edu/~rhicks/ http://www.princeton.edu/~rhicks/papa ers/gowa_hicks_io.zip)

International Monetary Fund. 1993. "A Guide to Direction of Trade Statistics" on CD-ROM and at h ttp://www.imf.org/external/pubs/cat/longres.cfm?sk=154.0.

International Monetary Fund. D*irection of Trade Statistics: Historical Database and Browser* on CD- ROM.

International Monetary Fund. 2007-2011. *Direction of Trade Statistics on CD-ROM.* Monthly Subscription.

International Monetary Fund. 2008. "Data and Statistics: Direction of Trade Statistics Consistency between partner country data." http://www.imfstatistics.org/dot/DOTConsi.htm

Officer, Lawrence H. 2015. "Exchange Rates between the United States Dollar and Forty-One Currencies." Measuring Worth: http://www.measuringworth.com/exchangeglobal/. Accessed November 3, 2015.

Plagge, Arnd. 2009. "Trading for War." Unpublished Manuscript. Yale University, New Haven, CT.

Peterson, Timothy M. 2017. "Export Diversity and Human Rights." Accepted for publication in

Journal of Conflict Resolution.

Republic of China (ROC) Bureau of Foreign Trade Website. 2008. Data source, Directorate General of Customs, Ministry of Finance. http://cus93.trade.gov.tw/english/FSCE/FSC0011E.ASP

Republic of China (ROC), 2002, 2004. Council for Economic Planning and Development, Taiwan Statistical Data Book. http://www.cepd.gov.tw/english/file/2004DataBook.pdf?CFID=87002&CFTOKEN=50209 7 07

STATA13. (2014) Statistics/Data Analysis. College Station, TX: StataCorp

United Nations, Statistical Office, Department of Economic Affairs. *Yearbook of International Trade Statistics.* New York: United Nations, 1951-1984.

United Nations. 1962. "International Trade Statistics 1900 – 1960." http://unstats.un.org/unsd/trade/data/tables.asp#historical Accessed on October 3, 2015.

Appendix A

Table A-1. Zeev Maoz's Analysis of Spikes and dips in the COW, Version 4.0 trade data.

Change Type	Size of Change	Pct. Cases
Upward Change Flow 1	> 50%	14.96
Upward Change Flow 1	>100%	9.59
Downward Change Flow 1	< -50%	11.77
Downward Change Flow 1	-100%	4.11
Flow 1 Change from Zero to Something		5.05
Flow 1 Change from Something to Zero		4.18
Flow 1 Spike	>.50% ® <-50%	4.13
Flow 1 Dip	< -50% ® > 50%	3.6
Upward Change Total Trade	> 50%	17.93
Upward Change Total Trade	>100%	11.28
Downward Change Total Trade	< -50%	12.43
Downward Change Total Trade	-100%	3.67
Tot. Trade Change from Zero to Something		3.75
Tot. Trade Change from Something to Zero		2.98
Tot. Trade Spike	>.50% ® <-50%	3.41
Tot. Trade Dip	< -50% ® > 50%	2.96

Key:

An upward change > 50% means that there was more than a 50% increase in trade from one year to the next.

A downward change < -50% means that there was more than 50% drop in trade from one year to the next.

A spike in trade values was determined by first creating a variable containing the percentage change in flows between time *t* and time *t-1* (calculated as follows: (flow at time *t* – flow at time *t-1*)/ flow at time *t-1*.

A spike was considered to have occurred and labeled as 1, if the percentage change in flow at time *t* was greater than 50% and simultaneously the percentage change in flow at time *t+1* was less than –50%.

A dip in trade values was considered to have occurred and labeled as 1, if the percentage change in flow at time *t* was less than - 50% and simultaneously the percentage change in flow at time *t+1* was greater than 50 percent. Total Trade = Flow1+Flow2.