GATT Analysis

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Contents

Next steps

To do

1. Create centralized documentation
   - Include history from Unsolved problems in coding.docx (OneDrive)
2. Resolve "complicated" paragraphs, including 4 that still have no tariffs
   - *Matt is looking through last three rounds*

3. **Kennedy, Tokyo, Uruguay**

4. Choose other countries

   - Refine *Members.in.GATT.xlsx*
   - Focus on Benelux, Canada, Chile, France, India, U.K., Dominican Republic, Haiti, Italy, Germany, Peru, Japan
     - Matt is adding # of pages for each schedule

5. **Make list of accuracy checks, run them, fix typos in data**

   - Check for tariffs going up from round to round

6. **Figure out how to integrate "free" list**

   - For which rounds do we have the free list typed up? Just Torquay Free List.xlsx on G: drive

7. Condense data cleaning code

8. Read and summarize "Tariff negotiations and renegotiations under the GATT and the WTO" (hard copy at SU library)

   - Victor will ask Matt to see if he can get the book from the library, let me know if not

9. Read through Victor's notes for ideas

   - What is status of 'interesting paragraphs.pdf' and 'Splitting paragraphs in Dillon.pdf"?

10. Go back to questions in *Plan.docx* when last three rounds are finished

11. Identify lines that switch between specific and ad valorem

12. Look for gradualism in graphs

13. 10 lines in Dillon that have more than 2 years

14. Think about how variation in units affects specific summary stats

    - Look into trade-weighting

15. TOT analysis

16. Find implementation years (maybe get answer from Doug Irwin)

17. Get working draft together ASAP

18. Add Schedule A tariff data from 1946 (last available before Geneva 1947)

    - Are current Column 2 tariffs Smoot Hawley or the 1946 tariffs?

Done

1. ~~Make Github version for CEA abstract~~
2. ~~Contact Tricia Mueller (USITC) and Roy Santana (WTO) [Bob Staiger's suggestions] [Feb 24]~~
3. ~~Figure out how to source multiple code files~~
4. ~~Program stats into abstract~~
5. ~~Resolve copyright issues, then (hopefully) post the correct schedules on Github~~
6. ~~Determine that TSUS tariffs were always at 5 digit, so we can just use the 5-digit tariff for all of the 7-digit subcategories~~
7. ~~Read and summarize "Two Centuries of Tariffs" (USITC, in G:drive folder)~~
8. ~~Consolidate various notes in Github / One Drive / G drive~~

Importing and cleaning the data

Importing and cleaning the data is done in "data_cleaning.rmd". It needs to be reprogrammed before being added here because it is nearly 1000 lines long. The chunk below calls that program to make the processed data available to the rest of the commands in this document.

Basic summary statistics

Specific tariffs

We see below that the specific tariffs come down by roughly half from Smoot Hawley.

- About half came in Geneva, the rest through Dillon. That is, Geneva did half the work and the following four rounds did the other half

But this could be deceptive since different lines use different units

- Victor has standardized everything to be in cents (per U.S. dollar) in UnitsKey.rmd

```
source('UnitsKey.r')
```

	Summary Statistics of Specific Tariffs by Round						
	Min	1st Quartile	Mean	Median	3rd Quartile	Max	N
Smoot Hawley	0	2.00	47.90	6.00	30.0	3000	1527
Geneva	0	1.25	32.95	5.00	25.0	2000	1530
Annecy	0	1.14	31.97	4.08	25.0	2000	1526
Torquay	0	1.00	27.54	3.50	20.0	2000	1524
GenevaA	0	1.00	27.11	3.50	20.0	2000	1526
GenevaB	0	1.00	26.72	3.45	20.0	2000	1526
GenevaC	0	1.00	26.38	3.40	20.0	2000	1523
DillonA	0	1.00	25.42	3.00	19.0	2000	1521
DillonB	0	1.00	24.73	3.00	17.5	2000	1521

Ad valorem tariffs

Strikingly, the reductions look to be of the same magnitude for Ad valorem, again with Geneva doing about half the work.

	Summary Statistics of Ad Valorem Tariffs by Round						
	Min	1st Quartile	Mean	Median	3rd Quartile	Max	N
Smoot Hawley	5.00	25.0	38.79	35.00	50.00	90	1963
Geneva	2.50	15.0	27.51	25.00	35.00	90	1947
Annecy	2.50	15.0	26.37	22.50	35.00	90	1950
Torquay	1.88	12.5	22.44	20.00	30.00	90	1948
GenevaA	1.88	11.5	21.89	17.88	28.25	90	1946
GenevaB	1.88	11.0	21.67	17.75	27.50	118	1946
GenevaC	1.88	10.5	21.39	17.50	27.50	90	1947
DillonA	1.00	10.5	19.52	15.50	25.00	90	1943
DillonB	0.50	10.0	18.95	15.00	25.00	90	1943

- In Dillon, 1053 rows out of 2996 are missing, so there are 1943 ad valorem tariffs. So 64.85% of lines have *ad valorem* tariffs.

How did liberalization vary across Schedules?

First, descriptions of each schedule:

Smoot Hawley Schedule Titles		
Schedule	# Lines	Title
1	397	Chemicals, Oil, and Paints
2	243	Earths, Earthenware, and Glassware
3	662	Metals and Manufactures of
4	52	Wood and Manufactures of
5	17	Sugar, Molasses, and Manufactures of
6	12	Tobacco and Manufactures of
7	461	Agricultural Products and Provisions
8	33	Spirits, Wines, and other Beverages
9	116	Cotton Manufactures
10	84	Flax, Hemp, Jute, and Manufactures of
11	152	Wool and Manufactures of
12	36	Silk Manufactures
13	53	Manufactures of Rayon or Other Synthetic Textile
14	146	Papers and Books
15	532	Sundries

Summary stats for specific tariffs

Sched	SH_mean	DB_mean	mean_chg	SH_med	DB_med	med_chg	SH_obs	DB_obs	n
1	24.33	13.51	44.48	5.00	2.50	50.00	258	264	397
2	45.04	28.21	37.38	10.00	5.55	44.50	112	106	243
3	55.01	26.14	52.49	3.50	2.00	42.86	316	305	662
4	53.55	22.61	57.78	60.00	17.50	70.83	6	6	52
5	24.42	23.28	4.69	0.38	0.15	59.73	11	11	17
6	147.50	62.19	57.84	52.50	23.50	55.24	12	12	12
7	28.53	15.74	44.83	3.00	1.50	50.00	349	348	461
8	277.42	80.98	70.81	125.00	42.00	66.40	31	31	33
9	8.60	21.60	-151.14	6.50	15.00	-130.77	8	15	116
10	12.63	5.04	60.06	2.00	1.50	25.00	37	37	84
11	39.96	31.42	21.37	40.00	33.00	17.50	134	134	152
12	NaN	NaN	NaN	NA	NA	NA	0	0	36
13	41.03	25.58	37.67	45.00	25.00	44.44	34	40	53
14	11.66	12.84	-10.16	5.00	2.00	60.00	85	86	146
15	113.80	56.48	50.37	10.00	7.00	30.00	134	126	532

The table below is exactly the same as the one above EXCEPT it drops the 218 lines that are impacted by the "tax interval" issue

Sched	SH_mean	DB_mean	mean_chg	SH_med	DB_med	med_chg	SH_obs	DB_obs	n
1	24.47	13.59	44.45	5.00	2.50	50.00	256	262	389
2	53.99	29.96	44.50	10.00	5.25	47.50	90	90	199
3	58.20	23.53	59.57	4.00	2.00	50.00	298	288	610
4	53.55	22.61	57.78	60.00	17.50	70.83	6	6	52
5	24.42	23.28	4.69	0.38	0.15	59.73	11	11	17
6	147.50	62.19	57.84	52.50	23.50	55.24	12	12	12
7	28.78	15.83	44.99	3.00	1.50	50.00	346	346	458
8	277.42	80.98	70.81	125.00	42.00	66.40	31	31	33
9	11.30	6.75	40.23	10.00	6.06	39.38	6	6	89
10	12.63	5.04	60.06	2.00	1.50	25.00	37	37	84
11	39.30	28.30	27.99	40.00	33.00	17.50	121	121	137
12	NaN	NaN	NaN	NA	NA	NA	0	0	33
13	38.86	21.70	44.15	45.00	25.00	44.44	22	22	25
14	11.66	7.11	39.00	5.00	2.00	60.00	85	85	143
15	85.88	50.60	41.08	6.00	4.00	33.33	124	117	497

Notes:

- 8 (spirits) largest, and consistent across rounds (1 ad valorem only)
- 5 (sugar) unambiguously smallest cuts, had some of the highest ad-valorem
- Reduction in median vs. mean: split exactly half and half as to which reduction was smaller
- Schedule 12 must be all ad valorem

Mean of specific tariffs by schedule and round

Sched	SH	G1	An	To	GC	DB	chgG1	chgAn	chgTo	chgGC	chgDB
1	24.33	21.22	21.13	16.60	15.73	13.51	12.79	0.42	21.45	5.22	14.13
2	45.04	36.47	35.55	29.77	28.81	28.21	19.03	2.53	16.26	3.20	2.10
3	55.01	37.18	36.55	30.97	29.65	26.14	32.41	1.69	15.28	4.26	11.84
4	53.55	24.27	22.61	22.61	22.61	22.61	54.67	6.87	0.00	0.00	0.00
5	24.42	23.49	23.33	23.32	23.31	23.28	3.82	0.70	0.03	0.02	0.16
6	147.50	94.96	86.42	67.25	62.65	62.19	35.62	9.00	22.18	6.85	0.73
7	28.53	19.02	18.78	16.70	16.62	15.74	33.36	1.24	11.06	0.51	5.27
8	277.42	166.61	139.80	99.80	88.68	80.98	39.94	16.09	28.61	11.14	8.68
9	8.60	22.38	22.38	21.90	21.90	21.60	-160.19	0.00	2.12	0.00	1.38
10	12.63	7.28	7.19	5.16	5.15	5.04	42.33	1.25	28.29	0.13	2.06
11	39.96	30.29	30.18	29.15	29.15	31.42	24.20	0.37	3.41	0.00	-7.80
12	NaN	150.00	150.00	150.00	150.00	NaN	NaN	0.00	0.00	0.00	NaN
13	41.03	28.33	27.89	25.33	25.33	25.58	30.94	1.55	9.20	-0.02	-0.95
14	11.66	18.50	18.40	16.27	14.93	12.84	-58.73	0.57	11.60	8.20	14.00
15	113.80	66.76	66.45	62.18	58.38	56.48	41.34	0.47	6.41	6.11	3.26

Removing tax interval lines

Sched	SH	G1	An	To	GC	DB	chgG1	chgAn	chgTo	chgGC	chgDB
1	24.47	21.47	21.38	16.72	15.85	13.59	12.26	0.43	21.76	5.24	14.25
2	53.99	40.71	39.36	31.94	30.82	29.96	24.61	3.30	18.84	3.53	2.77
3	58.20	36.46	35.44	29.80	28.47	23.53	37.36	2.79	15.92	4.47	17.35
4	53.55	24.27	22.61	22.61	22.61	22.61	54.67	6.87	0.00	0.00	0.00
5	24.42	23.49	23.33	23.32	23.31	23.28	3.82	0.70	0.03	0.02	0.16
6	147.50	94.96	86.42	67.25	62.65	62.19	35.62	9.00	22.18	6.85	0.73
7	28.78	19.12	18.88	16.80	16.71	15.83	33.55	1.24	11.06	0.51	5.27
8	277.42	166.61	139.80	99.80	88.68	80.98	39.94	16.09	28.61	11.14	8.68
9	11.30	7.94	7.94	6.75	6.75	6.75	29.72	0.00	14.95	0.00	0.00
10	12.63	7.28	7.19	5.16	5.15	5.04	42.33	1.25	28.29	0.13	2.06
11	39.30	30.20	30.07	28.95	28.95	28.30	23.15	0.41	3.72	0.00	2.27
12	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
13	38.86	24.77	24.77	21.70	21.70	21.70	36.26	0.00	12.39	0.00	0.00
14	11.66	10.19	10.09	7.93	7.86	7.11	12.57	1.04	21.40	0.84	9.55
15	85.88	60.69	60.64	56.09	52.28	50.60	29.33	0.09	7.49	6.80	3.22

Summary stats for ad valorem tariffs

Sched	SH_mean	DB_mean	mean_chg	SH_med	DB_med	med_chg	SH_obs	DB_obs	n
1	29.81	14.21	52.31	25.00	12.50	50.00	206	205	397
2	44.61	23.93	46.37	45.00	21.00	53.33	155	158	243
3	37.65	17.25	54.19	35.00	13.00	62.86	468	479	662
4	34.21	15.58	54.47	33.33	15.00	55.00	46	46	52
5	50.83	31.92	37.21	50.00	22.50	55.00	6	6	17
6	25.00	7.75	69.00	25.00	7.75	69.00	2	2	12
7	31.40	14.01	55.39	35.00	12.50	64.29	116	117	461
8	60.00	30.00	50.00	60.00	30.00	50.00	1	1	33
9	36.12	22.35	38.12	40.00	20.00	50.00	110	103	116
10	37.58	15.10	59.82	40.00	12.50	68.75	55	55	84
11	49.76	25.02	49.71	50.00	25.00	50.00	110	105	152
12	57.36	23.38	59.25	60.00	21.00	65.00	36	36	36
13	51.94	26.81	48.39	50.00	25.00	50.00	49	39	53
14	21.70	8.68	60.00	20.00	8.00	60.00	125	124	146
15	43.95	22.60	48.58	40.00	17.00	57.50	478	467	532

For several paragraphs, the maximum tariff for Dillon B changes when we get rid of the tax interval lines (2,9,11). Still I'm not going to print the tables with the maxes in them for now.

Sched	SH_mean	DB_mean	mean_chg	SH_med	DB_med	med_chg	SH_obs	DB_obs	n
1	29.80	14.08	52.73	25.00	12.50	50.00	198	198	389
2	42.40	21.52	49.26	45.00	20.00	55.56	127	127	199
3	38.15	17.38	54.46	35.00	13.00	62.86	432	443	610
4	34.21	15.58	54.47	33.33	15.00	55.00	46	46	52
5	50.83	31.92	37.21	50.00	22.50	55.00	6	6	17
6	25.00	7.75	69.00	25.00	7.75	69.00	2	2	12
7	31.40	14.04	55.28	35.00	12.50	64.29	116	116	458
8	60.00	30.00	50.00	60.00	30.00	50.00	1	1	33
9	34.42	21.55	37.41	35.00	20.00	42.86	85	85	89
10	37.58	15.10	59.82	40.00	12.50	68.75	55	55	84
11	49.21	23.48	52.28	50.00	22.50	55.00	97	97	137
12	57.12	23.32	59.18	60.00	20.00	66.67	33	33	33
13	54.40	25.82	52.54	60.00	22.50	62.50	25	25	25
14	21.49	8.70	59.53	20.00	8.00	60.00	122	122	143
15	44.30	21.95	50.44	40.00	17.00	57.50	443	441	497

Mean of ad valorem tariffs by schedule and round

Sched	SH	G1	An	To	GC	DB	chgG1	chgAn	chgTo	chgGC	chgDB
1	29.81	21.86	21.32	17.42	16.56	14.21	26.67	2.47	18.26	4.98	14.16
2	44.61	32.36	30.37	25.73	25.32	23.93	27.45	6.15	15.30	1.57	5.52
3	37.65	28.01	26.65	21.16	20.04	17.25	25.62	4.83	20.60	5.30	13.93
4	34.21	25.20	22.53	21.18	18.89	15.58	26.36	10.57	5.99	10.81	17.55
5	50.83	33.58	33.58	33.58	33.58	31.92	33.93	0.00	0.00	0.00	4.96
6	25.00	15.62	15.62	9.38	7.75	7.75	37.50	0.00	40.00	17.33	0.00
7	31.40	21.23	19.70	16.83	15.94	14.01	32.37	7.24	14.54	5.28	12.15
8	60.00	60.00	60.00	30.00	30.00	30.00	0.00	0.00	50.00	0.00	0.00
9	36.12	26.25	25.62	23.03	22.81	22.35	27.32	2.40	10.12	0.97	1.98
10	37.58	20.64	20.41	19.68	18.31	15.10	45.09	1.10	3.56	6.97	17.53
11	49.76	26.83	26.65	24.52	23.93	25.02	46.09	0.68	7.97	2.41	-4.56
12	57.36	39.07	36.14	30.79	27.43	23.38	31.89	7.50	14.82	10.90	14.78
13	51.94	35.41	33.66	28.78	26.99	26.81	31.83	4.94	14.49	6.23	0.67
14	21.70	13.88	12.95	11.13	10.41	8.68	36.05	6.66	14.09	6.43	16.63
15	43.95	32.78	31.83	27.75	26.47	22.60	25.42	2.90	12.83	4.59	14.63

Removing tax interval lines

Sched	SH	G1	An	To	GC	DB	chgG1	chgAn	chgTo	chgGC	chgDB
1	29.80	21.68	21.13	17.21	16.31	14.08	27.23	2.56	18.56	5.22	13.64
2	42.40	29.52	27.43	23.29	22.67	21.52	30.39	7.07	15.10	2.68	5.07
3	38.15	28.75	27.49	21.51	20.46	17.38	24.64	4.41	21.74	4.88	15.08
4	34.21	25.20	22.53	21.18	18.89	15.58	26.36	10.57	5.99	10.81	17.55
5	50.83	33.58	33.58	33.58	33.58	31.92	33.93	0.00	0.00	0.00	4.96
6	25.00	15.62	15.62	9.38	7.75	7.75	37.50	0.00	40.00	17.33	0.00
7	31.40	21.33	19.78	16.89	16.00	14.04	32.06	7.26	14.60	5.31	12.22
8	60.00	60.00	60.00	30.00	30.00	30.00	0.00	0.00	50.00	0.00	0.00
9	34.42	25.74	24.97	22.21	21.94	21.55	25.24	2.97	11.05	1.22	1.80
10	37.58	20.64	20.41	19.68	18.31	15.10	45.09	1.10	3.56	6.97	17.53
11	49.21	27.12	26.92	24.63	23.96	23.48	44.88	0.76	8.51	2.72	1.98
12	57.12	38.71	35.61	29.92	26.36	23.32	32.23	8.02	15.96	11.90	11.55
13	54.40	35.00	35.00	27.60	26.06	25.82	35.66	0.00	21.14	5.58	0.92
14	21.49	13.92	12.98	11.12	10.43	8.70	35.24	6.74	14.29	6.24	16.60
15	44.30	32.44	31.47	27.13	25.82	21.95	26.76	3.00	13.78	4.84	14.97

What was the total reduction in negotiated tariffs under the GATT in each round?

Mean and median of specific tariffs in each round

	Decrease in specific tariffs by round			
	Mean	% decrease	Median	% decrease
Smoot Hawley	47.90	0.00	6.00	0.00
Geneva	32.95	31.22	5.00	16.67
Annecy	31.97	2.97	4.08	18.50
Torquay	27.54	13.86	3.50	14.11
GenevaA	27.11	1.56	3.50	0.00
GenevaB	26.72	1.44	3.45	1.43
GenevaC	26.38	1.28	3.40	1.45
DillonA	25.42	3.63	3.00	11.76
DillonB	24.73	2.71	3.00	0.00

	Decrease in ad valorem tariffs by round			
	Mean	% decrease	Median	% decrease
Smoot Hawley	38.79	0.00	35.00	0.00
Geneva	27.51	29.09	25.00	28.57
Annecy	26.37	4.13	22.50	10.00
Torquay	22.44	14.93	20.00	11.11
GenevaA	21.89	2.42	17.88	10.62
GenevaB	21.67	1.00	17.75	0.70
GenevaC	21.39	1.30	17.50	1.41
DillonA	19.52	8.76	15.50	11.43
DillonB	18.95	2.90	15.00	3.23

Which lines were only ad valorem, only specific, or both?

Mixed

Next we need to know about the lines that have both ad valorem and specific (or take them out from above); at least quantify them to start

How many lines have both ad valorem and specific in each round?

- Smoot Hawley: 498
- Geneva 1947: 485
- Annecy: 484
- Torquay: 480
- Geneva56A: 480
- Geneva56B: 480
- Geneva56C: 478
- DillonA: 472
- DillonB: 472

Victor's intuition on mixed lines

I believe many of the changes from specific tax to ad valorem or otherwise is because of the tax intervals. You could search the keywords "tax boundaries" and "tax interval(s)" in Extra column of every round to locate them.

Proportions of specific, ad valorem, mixed

A few lines in each round have neither specific nor ad valorem. Matt is working on fixing this

```
[1] "Smoot-Hawley"

 Sched Product Paragraph    id
     3       1  368.c_18 1078
     8       1       810 1877
    14       1      1408 2411
    15      17    1532.a 2831

[1] "Dillon B"

 Sched Product Paragraph    id
     3       1  368.c_18 1078
     8       1       810 1877
    14       1      1408 2411
    15      17    1532.a 2831
```

How many lines see no change from Smoot Hawley to Dillon B?

```
lines <- data_set %>%
        mutate(av_pc =((Ad_Valorem_SH - Ad_Valorem_Dillon_B)/Ad_Valorem_SH)*100,sp_pc
        =((Specific_SH - Specific_Dillon_B)/Specific_SH)*100)

lines2 <- subset(lines,is.na(sp_pc) | sp_pc==0) %>% subset(is.na(av_pc) | av_pc==0)
```

The code above produces 371 lines that are the same in Smoot Hawley and Dillon B (i.e. that don't change at all through these five rounds of negotiations–we assume. We still need a check for rates going up.)

Summarizing the impact of tax intervals

Implementation dates

Geneva 1: January 1, 1948 (Irwin 2017, p. 486)

TOT analysis

We'll need measure of importer market power

1. inverse foreign supply elasticities are at HS6 level, are much more recent

   - Ross will look into the feasibility (data and code) of creating these measures for the 1930s/40s
   - Would we want Broda, Limao, Weinstein version (requires trade flows only) or Anson Soderbery's heterogeneous version?
   - Ross recalls he's seen a joint project between Anson Soderbery and Doug Irwin about the 1930s

2. product differentiaton index (Rauch), also newer, but maybe less sensitive to changes over time

3. market share might be credible enough, and easier to get

We'll need to think about whether it's credible to try the identification strategy Ross has used in his work