GATT Analysis

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2/6/2021

Contents

Next steps

1. Program stats into abstract (after making Github version for CEA abstract)
2. Can we add TOT analysis? Talk to Ross. If not, some other analysis?
3. Kennedy, Tokyo, Uruguay
   - Go back to questions in *Plan.docx* when last three rounds are finished
4. Choose other countries – first add # of pages for each schedule
   - Refine *Members.in.GATT.xlsx*
   - Focus on Benelux, Canada, Chile, France, India, U.K., Dominican Republic, Haiti, Italy, Germany, Peru, Japan
5. Consolidate various notes in Github / One Drive / G drive – create centralized documentation

- Clean up Github repo
- Resolve copyright issues, then (hopefully) post the correct schedules on Github
- Read through Victor's notes for ideas (what is status of emailed files from last week?)

6. Make list of accuracy checks, run them, fix typos in data
    - Resolve "complicated" paragraphs, including 9 that still have no tariffs
    - Check for tariffs going up from round to round
    - 30-40 more lines have both specific and ad valorem than they did at the beginning of last week. Why?
7. Condense data cleaning code
8. Figure out how to source multiple code files
9. Identify lines that switch between specific and ad valorem
10. Look for gradualism in graphs
11. 10 lines in Dillon that have more than 2 years
12. Think about how variation in units affects specific summary stats
    - Look into trade-weighting
13. Find implementation years (maybe get answer from Doug Irwin)
14. Contact the two people Bob Staiger suggested
15. Get working draft together ASAP

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.

```
# both this source statement and the following "code" command work to include the data,
#but I haven't yet figured out how to also include UnitsKeys.rmd below,
#so I'm leaving them both here as future debugging options
source("C:/Users/krist/Github/Gradualism/data_cleaning.rmd", local = knitr::knit_global())

#```{r cleandata, code=readLines('C:/Users/krist/Github/Gradualism/data_cleaning.rmd'),eval=TRUE,messag
#```
```

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

	Summary Statistics of Specific Tariffs by Round						
	Min	1st Quartile	Mean	Median	3rd Quartile	Max	N
Smoot Hawley	0	2.00	48.17	6.0	30.00	3000	1528
Geneva	0	1.25	33.22	5.0	25.00	2000	1531
Annecy	0	1.16	32.23	4.2	25.00	2000	1528
Torquay	0	1.00	27.82	3.5	20.00	2000	1525
GenevaA	0	1.00	27.39	3.5	20.00	2000	1527
GenevaB	0	1.00	27.00	3.5	20.00	2000	1527
GenevaC	0	1.00	26.66	3.4	20.00	2000	1524
DillonA	0	1.00	25.40	3.0	18.75	2000	1519
DillonB	0	1.00	24.73	3.0	17.50	2000	1518

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	38.82	35.00	50.0	90	1958
Geneva	2.50	15.0	27.51	25.00	35.0	90	1943
Annecy	2.50	15.0	26.39	22.50	35.0	90	1946
Torquay	1.88	12.5	22.43	20.00	30.0	90	1944
GenevaA	1.88	11.5	21.89	17.75	27.5	90	1943
GenevaB	1.88	11.0	21.67	17.50	27.5	118	1943
GenevaC	1.88	10.5	21.39	17.50	27.5	90	1944
DillonA	1.00	10.5	19.52	15.50	25.0	90	1941
DillonB	0.50	10.0	18.94	15.00	25.0	90	1942

- In Dillon, 1056 rows out of 2998 are missing, so there are 1942 ad valorem tariffs. So 64.78% 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	661	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	34	Spirits, Wines, and other Beverages
9	116	Cotton Manufactures
10	84	Flax, Hemp, Jute, and Manufactures of
11	153	Wool and Manufactures of
12	36	Silk Manufactures
13	53	Manufactures of Rayon or Other Synthetic Textile
14	146	Papers and Books
15	533	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	56.25	26.13	53.55	3.50	2.00	42.86	317	302	661
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	34
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	153
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	533

The table below is exactly the same as the one above EXCEPT it drops the 214 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	59.32	23.36	60.61	4.00	2.00	50.00	300	287	613
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	34
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	138
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	498

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	35.27	29.77	28.81	28.21	19.03	3.30	15.60	3.20	2.10
3	56.25	38.50	37.89	32.32	31.01	26.13	31.55	1.58	14.72	4.04	15.75
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	38.98	31.94	30.82	29.96	24.61	4.23	18.06	3.53	2.77
3	59.32	37.86	36.85	31.13	29.75	23.36	36.17	2.67	15.54	4.43	21.46
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	29.80	14.21	52.31	25.00	12.50	50.00	204	205	397
2	44.87	24.06	46.37	45.00	21.00	53.33	154	157	243
3	37.65	17.16	54.42	35.00	13.00	62.86	467	479	661
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	34
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	49.94	25.02	49.89	50.00	25.00	50.00	109	105	153
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	533

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	196	198	389
2	42.70	21.67	49.26	45.00	20.00	55.56	126	126	199
3	38.16	17.32	54.62	37.50	13.00	65.33	434	445	613
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	34
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	49.41	23.48	52.48	50.00	22.50	55.00	96	97	138
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	498

Mean of ad valorem tariffs by schedule and round

Sched	SH	G1	An	To	GC	DB	chgG1	chgAn	chgTo	chgGC	chgDB
1	29.80	21.77	21.23	17.30	16.49	14.21	26.94	2.50	18.51	4.68	13.81
2	44.87	32.54	30.70	25.88	25.47	24.06	27.48	5.66	15.71	1.57	5.52
3	37.65	27.98	26.62	21.12	20.00	17.16	25.68	4.85	20.67	5.32	14.19
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	49.94	26.83	26.65	24.52	23.93	25.02	46.28	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	21.60	21.04	17.08	16.24	14.08	27.51	2.60	18.83	4.90	13.27
2	42.70	29.71	27.81	23.45	22.83	21.67	30.41	6.41	15.65	2.68	5.08
3	38.16	28.76	27.50	21.59	20.44	17.32	24.64	4.38	21.48	5.35	15.27
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	49.41	27.12	26.92	24.63	23.96	23.48	45.11	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	48.17	0.00	6.0	0.00
Geneva	33.22	31.03	5.0	16.67
Annecy	32.23	2.99	4.2	16.00
Torquay	27.82	13.69	3.5	16.67
GenevaA	27.39	1.54	3.5	0.00
GenevaB	27.00	1.43	3.5	0.00
GenevaC	26.66	1.26	3.4	2.86
DillonA	25.40	4.73	3.0	11.76
DillonB	24.73	2.62	3.0	0.00

	Decrease in ad valorem tariffs by round			
	Mean	% decrease	Median	% decrease
Smoot Hawley	38.82	0.00	35.00	0.00
Geneva	27.51	29.14	25.00	28.57
Annecy	26.39	4.09	22.50	10.00
Torquay	22.43	14.99	20.00	11.11
GenevaA	21.89	2.41	17.75	11.25
GenevaB	21.67	1.01	17.50	1.41
GenevaC	21.39	1.30	17.50	0.00
DillonA	19.52	8.75	15.50	11.43
DillonB	18.94	2.95	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: 497
- Geneva 1947: 484
- Annecy: 484
- Torquay: 479
- Geneva56A: 480
- Geneva56B: 480
- Geneva56C: 478
- DillonA: 470
- DillonB: 470

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
2	1	222.d	578
3	1	368.c_18	1078
8	2	805	1865
8	1	810	1877
11	9	1101.a	2086
11	1	1117.c	2198
14	1	1408	2412
15	17	1532.a	2832
15	11	1558	2998

```
[1] "Dillon B"
```

Sched	Product	Paragraph	id
2	1	222.d	578
3	1	368.c_18	1078
8	2	805	1865
8	1	810	1877
11	9	1101.a	2086
14	1	1408	2412
15	17	1532.a	2832
15	11	1558	2998

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 380 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)