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)~~

	Summary Statistics of Specific Tariffs by Round						
	Min	1st Quartile	Mean	Median	3rd Quartile	Max	N
Smoot Hawley	0	2.00	48.07	6.00	30	3000	1528
Geneva	0	1.25	33.12	5.00	25	2000	1531
Annecy	0	1.15	32.15	4.15	25	2000	1527
Torquay	0	1.00	27.72	3.50	20	2000	1525
GenevaA	0	1.00	27.31	3.50	20	2000	1527
GenevaB	0	1.00	26.92	3.50	20	2000	1527
GenevaC	0	1.00	26.58	3.40	20	2000	1524
DillonA	0	1.00	25.34	3.00	19	2000	1521
DillonB	0	1.00	24.63	3.00	18	2000	1521

	Summary Statistics of Ad Valorem Tariffs by Round						
	Min	1st Quartile	Mean	Median	3rd Quartile	Max	N
Smoot Hawley	5.00	25.0	38.80	35.00	50.0	90	1963
Geneva	2.50	15.0	27.50	25.00	35.0	90	1947
Annecy	2.50	15.0	26.37	22.50	35.0	90	1950
Torquay	1.88	12.5	22.41	20.00	30.0	90	1948
GenevaA	1.88	11.5	21.88	17.62	27.5	90	1946
GenevaB	1.88	11.0	21.66	17.50	27.5	118	1946
GenevaC	1.88	10.5	21.37	17.50	27.5	90	1947
DillonA	1.00	10.5	19.49	15.50	25.0	90	1943
DillonB	0.50	10.0	18.92	15.00	25.0	90	1943

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')
```

Ad valorem tariffs

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

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	53	Wood and Manufactures of
5	17	Sugar, Molasses, and Manufactures of
6	12	Tobacco and Manufactures of
7	462	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

- In Dillon, 1054 rows out of 2997 are missing, so there are 1943 ad valorem tariffs. So 64.83% of lines have *ad valorem* tariffs.

How did liberalization vary across Schedules?

First, descriptions of each schedule:

Summary stats for specific tariffs

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

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

Removing tax interval lines

Summary stats for ad valorem tariffs

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.

Mean of ad valorem tariffs by schedule and round

Removing tax interval lines

Sched	SH_mean	DB_mean	mean_chg	SH_med	DB_med	med_chg	SH_obs	DB_obs	n
1	24.33	13.50	44.50	5.00	2.50	50.00	258	264	397
2	45.04	28.02	37.80	10.00	5.55	44.50	112	106	243
3	55.01	24.70	55.10	3.50	2.00	42.86	316	304	661
4	53.55	24.27	54.67	60.00	22.50	62.50	6	6	53
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	29.31	16.56	43.51	3.00	1.50	50.00	350	349	462
8	277.42	81.79	70.52	125.00	50.00	60.00	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

Sched	SH_mean	DB_mean	mean_chg	SH_med	DB_med	med_chg	SH_obs	DB_obs	n
1	24.47	13.58	44.48	5.00	2.50	50.00	256	262	389
2	53.99	29.74	44.92	10.00	5.25	47.50	90	90	199
3	58.20	21.99	62.21	4.00	2.00	50.00	298	287	609
4	53.55	24.27	54.67	60.00	22.50	62.50	6	6	53
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	29.56	16.65	43.67	3.00	1.50	50.00	347	347	459
8	277.42	81.79	70.52	125.00	50.00	60.00	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

Sched	SH	G1	An	To	GC	DB	chgG1	chgAn	chgTo	chgGC	chgDB
1	24.33	21.22	21.13	16.60	15.73	13.50	12.79	0.42	21.45	5.22	14.17
2	45.04	36.47	35.55	29.77	28.81	28.02	19.03	2.53	16.26	3.20	2.76
3	55.01	37.18	36.55	30.97	29.65	24.70	32.41	1.69	15.28	4.26	16.70
4	53.55	24.27	22.61	22.61	22.61	24.27	54.67	6.87	0.00	0.00	-7.37
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	29.31	19.82	19.59	17.51	17.43	16.56	32.38	1.19	10.57	0.49	5.01
8	277.42	166.61	139.80	99.80	89.48	81.79	39.94	16.09	28.61	10.34	8.60
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

Sched	Sp_SH	Sp_Ge	Sp_An	Sp_To	Sp_GC	Sp_DB	chgGe	chgAn	chgTo	chgGC	chgDB
1	24.47	21.47	21.38	16.72	15.85	13.58	12.26	0.43	21.76	5.24	14.28
2	53.99	40.71	39.36	31.94	30.82	29.74	24.61	3.30	18.84	3.53	3.49
3	58.20	36.46	35.44	29.80	28.47	21.99	37.36	2.79	15.92	4.47	22.74
4	53.55	24.27	22.61	22.61	22.61	24.27	54.67	6.87	0.00	0.00	-7.37
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	29.56	19.93	19.69	17.61	17.53	16.65	32.57	1.19	10.57	0.49	5.01
8	277.42	166.61	139.80	99.80	89.48	81.79	39.94	16.09	28.61	10.34	8.60
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

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

Mean and median of specific tariffs in each round

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

Sched	SH_mean	DB_mean	mean_chg	SH_med	DB_med	med_chg	SH_obs	DB_obs	n
1	29.81	14.18	52.42	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	37.71	17.15	54.53	35.00	13.00	62.86	467	478	661
4	33.91	15.46	54.41	33.33	15.00	55.00	47	47	53
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	462
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

Sched	SH_mean	DB_mean	mean_chg	SH_med	DB_med	med_chg	SH_obs	DB_obs	n
1	29.80	14.05	52.84	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	38.22	17.27	54.82	35.00	13.00	62.86	431	442	609
4	33.91	15.46	54.41	33.33	15.00	55.00	47	47	53
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	459
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

- Annecy: 484
- Torquay: 480
- Geneva56A: 480
- Geneva56B: 480
- Geneva56C: 478
- DillonA: 471
- DillonB: 471

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.

Sched	SH	G1	An	To	GC	DB	chgG1	chgAn	chgTo	chgGC	chgDB
1	29.81	21.86	21.32	17.42	16.55	14.18	26.67	2.47	18.26	4.99	14.34
2	44.61	32.36	30.37	25.73	25.32	23.93	27.45	6.15	15.30	1.57	5.52
3	37.71	28.02	26.66	21.11	19.99	17.15	25.71	4.84	20.81	5.32	14.21
4	33.91	24.87	22.27	20.52	18.70	15.46	26.65	10.48	7.84	8.85	17.35
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

Sched	SH	G1	An	To	GC	DB	chgG1	chgAn	chgTo	chgGC	chgDB
1	29.80	21.68	21.13	17.21	16.31	14.05	27.23	2.56	18.56	5.23	13.83
2	42.40	29.52	27.43	23.29	22.67	21.52	30.39	7.07	15.10	2.68	5.07
3	38.22	28.77	27.50	21.46	20.41	17.27	24.73	4.41	21.95	4.90	15.38
4	33.91	24.87	22.27	20.52	18.70	15.46	26.65	10.48	7.84	8.85	17.35
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

	Decrease in specific tariffs by round			
	Mean	% decrease	Median	% decrease
Smoot Hawley	48.07	0.00	6.00	0.00
Geneva	33.12	31.09	5.00	16.67
Annecy	32.15	2.95	4.15	17.00
Torquay	27.72	13.78	3.50	15.66
GenevaA	27.31	1.49	3.50	0.00
GenevaB	26.92	1.43	3.50	0.00
GenevaC	26.58	1.26	3.40	2.86
DillonA	25.34	4.66	3.00	11.76
DillonB	24.63	2.77	3.00	0.00

	Decrease in ad valorem tariffs by round			
	Mean	% decrease	Median	% decrease
Smoot Hawley	38.80	0.00	35.00	0.00
Geneva	27.50	29.12	25.00	28.57
Annecy	26.37	4.13	22.50	10.00
Torquay	22.41	15.01	20.00	11.11
GenevaA	21.88	2.38	17.62	11.88
GenevaB	21.66	1.00	17.50	0.71
GenevaC	21.37	1.30	17.50	0.00
DillonA	19.49	8.82	15.50	11.43
DillonB	18.92	2.91	15.00	3.23

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 1878
    14       1      1408 2412
    15      17    1532.a 2832
```

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

```
 Sched Product Paragraph   id
     3       1  368.c_18 1078
     8       1       810 1878
    14       1      1408 2412
    15      17    1532.a 2832
```

Tariff Increases

Here we are looking round by round for lines that had an increase in either the ad valorem or specific tariff (or both). Later we will look at lines that switch from one type of tariff to the other.

```
## [1] "Increased tariff from Smoot Hawley to Geneva"
```

```
##  Paragraph   id Product av_pc sp_pc Ad_Valorem_SH Ad_Valorem_Geneva Specific_SH
##        355  971       8    22  -300            45                35           2
##      718.a 1487       4   -47    NA            30                44          NA
##      901.a 1880       2  -300    NA             5                20          NA
##      901.b 1883       2  -150    NA            10                25          NA
##      904.a 1893       2  -175    NA            10                28          NA
##      904.b 1899       3  -131    NA            13                30          NA
##      904.c 1903       3  -100    NA            16                32          NA
##      911.a 1941       7   -38    NA            40                55          NA
##       1022 2074       2    NA   -25            NA                NA           8
##       1301 2283      17    NA   -22            50                NA          45
##       1301 2287      21    NA   -33            55                NA          45
##       1301 2289      23    NA   -11            50                NA          45
##     1526.a 2664       2  -120    NA            25                55         125
##     1526.a 2665       3  -120    NA            25                55         250
```

```
##     1526.a 2666       4  -120    NA            25                55         500
##     1526.a 2667       5   -90    NA            25                48         600
##     1526.a 2668       6   -90    NA            25                48         700
##     1526.a 2669       7   -60    NA            25                40         900
##     1526.a 2670       8   -60    NA            25                40        1200
##   1527.a.2 2676       2   -10    NA            50                55         100
##     1527.b 2679       2   -10    NA            50                55           6
##   1527.c.2 2681       1   -10    NA            50                55           1
##   1527.c.2 2682       2   -30    NA            50                65           1
##   1527.c.2 2683       3   -10    NA            50                55           1
##     1537.c 2869       2    43   -50            35                20           2
##  Specific_Geneva Units_SH Units_Geneva Interval
##                8       19           19       NA
##               NA       NA           NA       NA
##               NA       NA           NA       NA
##               NA       NA           NA       NA
##               NA       NA           NA       NA
##               NA       NA           NA       NA
##               NA       NA           NA       NA
##               NA       NA           NA        1
##               10       44           44       NA
##               55        1            1        1
##               60        1            1        1
##               50        1            1        1
##               NA       20           NA        1
##               NA       20           NA        1
##               NA       20           NA        1
##               NA       20           NA        1
##               NA       20           NA        1
##               NA       20           NA        1
##               NA       20           NA        1
##               NA       19           NA        1
##               NA       55           NA       NA
##               NA        1           NA       NA
##               NA        1           NA       NA
##               NA        1           NA       NA
##                3       19           19       NA

## [1] "Increased tariff from Geneva to Annecy"

##  Paragraph   id Product av_pc sp_pc Ad_Valorem_Geneva Ad_Valorem_Annecy
##        385 1240       2     0   -67               10                10
##   1005.a.3 2026       1    NA   -23               NA                NA
##  Specific_Geneva Specific_Annecy Units_Geneva Units_Annecy Interval
##              6.0              10           1            1       NA
##              3.2               4           1            1       NA

## [1] "Increased tariff from Annecy to Torquay"

##  Paragraph   id Product  av_pc sp_pc Ad_Valorem_Annecy Ad_Valorem_Torquay
##         59  280       2     NA   -50                NA                NA
##        331  857      10     NA   -33                NA                NA
##        360 1012       6 -50.00    NA              20.0                30
##        366 1047       4  -5.00    NA              50.0                52
##        394 1260       2     NA   -12                NA                NA
##        757 1672       2     NA  -800                NA                NA
```

```
##     1114.d 2178       4  -0.67     0              37.2                 38
##       1405 2349       3 -33.33     0               7.5                 10
##       1405 2359      13   0.00   -50              10.0                 10
##     1519.b 2634       1 -12.50    NA              20.0                 22
##     1537.b 2862       8 -25.00    NA              10.0                 12
##  Specific_Annecy Specific_Torquay Units_Annecy Units_Torquay Interval
##           600.00            900.0         1.0             1       NA
##             3.00              4.0         1.0             1       NA
##               NA               NA          NA            NA       NA
##               NA               NA          NA            NA       NA
##             1.00              1.1         1.0             1       NA
##             0.12              1.1         1.0             1       NA
##            37.50             37.5         1.0             1       NA
##             2.50              2.5         1.0             1       NA
##             1.00              1.5         0.5             1       NA
##               NA               NA          NA            NA       NA
##               NA               NA          NA            NA       NA
```

```
## [1] "Increased tariff from Torquay to Geneva56_C"
```

```
##  Paragraph   id Product  av_pc sp_pc Ad_Valorem_Torquay Ad_Valorem_Geneva56_C
##      202.a  410       7  -20.0    NA                 35                   42
##      202.a  411       8     NA -20.0                 NA                   NA
##      202.a  412       9  -20.0    NA                 25                   30
##      202.a  413      10   -7.1    NA                 28                   30
##      202.a  414      11     NA  -6.2                 NA                   NA
##      202.a  415      12   -5.0    NA                 20                   21
##      202.a  417      14  -18.3    NA                 30                   36
##      202.a  418      15   -6.2    NA                 24                   26
##        209  474       6  -71.4    NA                 18                   30
##        214  514       7  -70.0    NA                 20                   34
##        357  983       1 -122.2    NA                 22                   50
##        357  984       2 -122.2    NA                 22                   50
##        360 1007       1  -13.3    NA                 22                   26
##        397 1296      29  -11.1    NA                 45                   50
##        778 1814       1 -112.5    NA                  8                   17
##     1114.d 2177       3  -28.0   0.0                 25                   32
##  Specific_Torquay Specific_Geneva56_C Units_Torquay Units_Geneva56_C Interval
##                NA                  NA            NA               NA        1
##               5.0                 6.0             6                6        1
##                NA                  NA            NA               NA        1
##                NA                  NA            NA               NA        1
##               4.0                 4.2             6                6        1
##                NA                  NA            NA               NA        1
##                NA                  NA            NA               NA       NA
##                NA                  NA            NA               NA       NA
##                NA                  NA            NA               NA       NA
##                NA                  NA            NA               NA       NA
##               1.8                  NA            19               NA       NA
##               7.5                  NA            19               NA       NA
##                NA                  NA            NA               NA       NA
##                NA                  NA            NA               NA       NA
##                NA                  NA            NA               NA       NA
##              37.5                37.5             1                1       NA
```

```
## [1] "Increased tariff from Geneva56_C to Dillon_B"
```

Paragraph	id	Product	av_pc	sp_pc	Ad_Valorem_Geneva56_C	Ad_Valorem_Dillon_B
24	102	6	-300.0	67	9.0	36
24	103	7	-373.3	67	7.5	36
202.a	413	10	-30.0	NA	30.0	39
202.a	414	11	NA	-32	NA	NA
202.a	415	12	-33.3	NA	21.0	28
209	470	2	-37.1	NA	8.8	12
209	475	7	-55.6	NA	22.5	35
331	856	9	NA	-20	NA	NA
354	951	1	-70.0	68	25.0	42
354	952	2	-70.0	68	25.0	42
354	953	3	-54.5	67	27.5	42
354	960	10	-54.5	67	27.5	42
354	961	11	-54.5	72	27.5	42
354	962	12	-70.0	80	25.0	42
354	963	13	-54.5	86	27.5	42
365	1032	9	-18.4	-18	19.0	22
371	1097	2	NA	-50	NA	NA
371	1098	3	-50.0	NA	15.0	22
371	1100	5	NA	-50	NA	NA
371	1101	6	-50.0	NA	15.0	22
371	1102	7	-50.0	NA	15.0	22
371	1103	8	NA	-50	NA	NA
371	1104	9	-50.0	NA	7.5	11
371	1106	11	NA	-50	NA	NA
371	1107	12	-50.0	NA	15.0	22
372	1114	3	-33.3	NA	10.5	14
412	1338	7	NA	-100	NA	NA
721.e	1529	1	NA	-12	NA	NA
1014	2048	6	-300.0	NA	2.5	10
1108	2136	7	-140.0	0	25.0	60
1108	2137	8	-140.0	0	25.0	60
1108	2138	9	NA	-260	25.0	NA
1108	2139	10	NA	-260	25.0	NA
1108	2140	11	-52.0	0	25.0	38
1108	2141	12	-140.0	0	25.0	60
1108	2142	13	NA	-203	25.0	NA
1108	2143	14	NA	-203	25.0	NA
1108	2144	15	-52.0	0	25.0	38
1109.a	2145	1	-140.0	0	25.0	60
1109.a	2146	2	NA	-203	25.0	NA
1109.a	2147	3	-52.0	0	25.0	38
1109.a	2148	4	-50.0	0	20.0	30
1109.a	2149	5	-50.0	0	20.0	30
1109.a	2150	6	-50.0	0	20.0	30
1301	2274	8	-122.2	NA	22.5	50
1404	2336	9	-6.7	20	7.5	8
1549.a	2932	1	20.0	-7995	12.5	10

Specific_Geneva56_C	Specific_Dillon_B	Units_Geneva56_C	Units_Dillon_B	Interval
30.00	10.0	1	1	NA
51.00	17.0	1	1	NA
NA	NA	NA	NA	1

```
##                4.25               5.6                 6                 6         1
##                  NA                NA                NA                NA         1
##                  NA                NA                NA                NA        NA
##                  NA                NA                NA                NA        NA
##                3.00               3.6                 1                 1        NA
##                0.62               0.2                19                19        NA
##                2.50               0.8                19                19        NA
##                5.50               1.8                19                19        NA
##                7.50               2.5                19                19        NA
##                9.00               2.5                19                19        NA
##               12.50               2.5                19                19        NA
##               17.50               2.5                19                19        NA
##              425.00             500.0                19                19        NA
##              125.00             187.5                19                19         1
##                  NA                NA                NA                NA         1
##              200.00             300.0                19                19         1
##                  NA                NA                NA                NA         1
##                  NA                NA                NA                NA         1
##              125.00             187.5                19                19         1
##                  NA                NA                NA                NA         1
##              250.00             375.0                19                19         1
##                  NA                NA                NA                NA         1
##                  NA                NA                NA                NA        NA
##               10.00              20.0                18                18        NA
##                4.00               4.5                 1                 1        NA
##                  NA                NA                NA                NA        NA
##               30.00              30.0                 1                 1         1
##               30.00              30.0                 1                 1         1
##               30.00             108.0                 1                 1         1
##               30.00             108.0                 1                 1         1
##               30.00              30.0                 1                 1         1
##               37.50              37.5                 1                 1         1
##               37.50             113.5                 1                 1         1
##               37.50             113.5                 1                 1         1
##               37.50              37.5                 1                 1         1
##               37.50              37.5                 1                 1         1
##               37.50             113.5                 1                 1         1
##               37.50              37.5                 1                 1        NA
##               37.50              37.5                 1                 1        NA
##               37.50              37.5                 1                 1        NA
##               37.50              37.5                 1                 1        NA
##                  NA                NA                NA                NA         1
##                2.50               2.0                 1                 1        NA
##                0.21              17.0                 1                18        NA
```

No change from Smoot Hawley to Dillon B

```
sm_db <- 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)

sm_db2 <- subset(sm_db,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.)

No change from Smoot Hawley to Geneva

```
# all the lines that are exactly the same in Smoot Hawley and Geneva
same <- data_set %>%
        filter( ((is.na(Specific_SH) == is.na(Specific_Geneva) & is.na(Specific_SH)) | Specific_SH == S
                 & ((is.na(Ad_Valorem_SH) == is.na(Ad_Valorem_Geneva) & is.na(Ad_Valorem_SH)) | Ad_Valo
                 & ((is.na(Units_SH) == is.na(Units_Geneva) & is.na(Units_SH)) | Units_SH == Units_Gene

# supposed to be all the lines that have any difference, but misses lines that switch
# between ad valorem and specific. Almost certainly is because of treatment of NAs
diff <- data_set %>%
        filter( Specific_SH != Specific_Geneva | Ad_Valorem_SH != Ad_Valorem_Geneva |
                 Units_SH != Units_Geneva )

# lines that are NOT in "same"
t <- setdiff(data_set$id,same$id)
same_removed <- data_set[t,]

# lines that are NOT in either "same" or "diff"
t3 <- setdiff(same_removed$id,diff$id)
samediff_removed <- data_set[t3,]

# both these methods miss out on the ones that are not equal because one is an NA
units_diff <- data_set %>%
        filter( (Units_SH != Units_Geneva) )

units_diff2 <- data_set[which(data_set$Units_SH != data_set$Units_Geneva), ]

# tbl %>% rowwise(id) %>% mutate(s = sum(c_across(x:w)) %>% ungroup()
# all(is.na(x))
# all(is.na(c_across(stuff)))
```

The code above produces 1263 lines that are the same in Smoot Hawley and Geneva.

Lines that switch between specific, ad valorem, and compound

Below are the lines that either change units or change between specific only, ad valorem only or both specific and ad valorem. Indicator variables for each round (G for Geneva, A for Annecy, etc.) show in which round the change(s) occurred. Variable "unit_ch" equals 1 if the unit changed.

```
##  Sched Product  Paragraph   id  G  A  T GA GB GC DA DB unit_ch Interval
##      1      16       28.a  148 NA NA NA NA NA NA  1 NA       0        1
##      1       2         33  168  1 NA NA NA NA NA NA NA      NA       NA
##      1       8         41  197  1 NA NA NA NA NA NA NA      NA       NA
##      1       9         41  198  1 NA NA NA NA NA NA NA      NA       NA
##      1      10         41  199  1 NA NA NA NA NA NA NA      NA       NA
##      1      11         41  200  1 NA NA NA NA NA NA NA      NA       NA
##      1      12         41  201  1 NA NA NA NA NA NA NA      NA       NA
##      1      10         53  253  1 NA  1 NA NA NA NA NA      NA        1
##      1       6         72  324  1 NA NA NA NA NA NA NA      NA        1
##      2       1      202.a  404  1 NA NA NA NA NA NA NA      NA        1
```

```
##      2       3      202.a  406  1 NA NA NA NA NA NA NA      NA        1
##      2       4      202.a  407  1 NA NA NA NA NA NA NA      NA        1
##      2       6      202.a  409  1 NA NA NA NA NA NA NA      NA        1
##      2       7      202.a  410  1 NA NA NA NA NA NA NA      NA        1
##      2       9      202.a  412  1 NA NA NA NA NA NA NA      NA        1
##      2      10      202.a  413 NA NA  1 NA NA NA NA NA       0        1
##      2      12      202.a  415 NA NA  1 NA NA NA NA NA       0        1
##      2       4        210  479  1 NA NA NA NA NA NA NA      NA        1
##      2       2        212  489  1 NA NA NA NA NA NA NA      NA        1
##      2       4        212  491 NA NA  1 NA NA NA NA NA       0        1
##      2      11        212  498  1 NA NA NA NA NA NA NA      NA        1
##      2      14        212  501 NA NA  1 NA NA NA NA NA      NA        1
##      2       4        213  506  1 NA NA NA NA NA NA NA      NA        1
##      2       2      218.d  535  1 NA  1 NA NA NA NA NA      NA        1
##      2       5      218.d  538  1 NA NA NA NA NA NA NA      NA        1
##      2       7      218.f  554  1 NA NA NA NA NA NA NA      NA        1
##      2      11      218.f  558 NA NA NA NA NA NA  1 NA      NA        1
##      2       4        226  592 NA  1 NA NA NA NA NA NA       0        1
##      3       3      302.d  654 NA NA  1 NA NA NA NA NA       0       NA
##      3       3        304  693  1 NA NA NA NA NA NA NA      NA        1
##      3       4        304  694  1 NA NA NA NA NA NA NA      NA        1
##      3       5        304  695 NA  1 NA NA NA NA NA NA       0        1
##      3      11        304  701  1 NA NA NA NA NA NA NA      NA        1
##      3      12        304  702  1 NA NA NA NA NA NA NA      NA        1
##      3      13        304  703 NA  1 NA NA NA NA NA NA       0        1
##      3      21        304  711  1 NA NA NA NA NA NA NA      NA       NA
##      3      22        304  712  1 NA NA NA NA NA NA NA      NA       NA
##      3      23        304  713  1 NA NA NA NA NA NA NA      NA       NA
##      3      24        304  714  1 NA NA NA NA NA NA NA       0       NA
##      3      25        304  715 NA  1 NA NA NA NA NA NA       0       NA
##      3      26        304  716  1 NA NA NA NA NA NA NA       0       NA
##      3      30        304  720  1 NA NA NA NA NA NA NA      NA       NA
##      3      38        304  728  1 NA NA NA NA NA NA NA      NA        1
##      3      39        304  729  1 NA NA NA NA NA NA NA      NA        1
##      3      40        304  730  1 NA NA NA NA NA NA NA      NA        1
##      3      41        304  731 NA  1 NA NA NA NA NA NA       0        1
##      3      46        304  736 NA NA NA NA NA NA  1 NA       0       NA
##      3      47        304  737 NA NA NA NA NA NA  1 NA       0       NA
##      3      48        304  738 NA NA NA NA NA NA  1 NA       0       NA
##      3       1        308  749  1 NA  1 NA NA NA NA NA      NA        1
##      3       3        308  751  1 NA  1 NA NA NA NA NA      NA        1
##      3      12      316.a  790  1 NA NA NA NA NA NA NA      NA        1
##      3       4        318  799  1 NA NA NA NA NA NA NA      NA        1
##      3       7        318  802  1 NA NA NA NA NA NA NA      NA        1
##      3       1        357  983 NA NA NA NA NA  1 NA NA       0       NA
##      3       2        357  984 NA NA NA NA NA  1 NA NA       0       NA
##      3       7        358  996  1 NA NA NA NA NA NA NA      NA        1
##      3      16        365 1039 NA NA NA NA NA NA  1 NA       0       NA
##      3      18        365 1041 NA NA NA NA NA NA  1 NA       0       NA
##      3       1    368.c_2 1061 NA NA NA NA NA NA  1 NA      NA       NA
##      3       2    368.c_2 1062 NA NA NA NA NA NA  1 NA      NA       NA
##      3       1   368.c_17 1077 NA NA  1 NA NA NA NA NA       0       NA
##      3       2        371 1097  1 NA NA NA NA NA NA NA      NA        1
##      3       5        371 1100  1 NA NA NA NA NA NA NA      NA        1
```

```
##      3       8        371 1103  1 NA NA NA NA NA NA NA      NA        1
##      3      11        371 1106  1 NA NA NA NA NA NA NA      NA        1
##      3      14        371 1109  1 NA NA NA NA NA NA NA      NA        1
##      3       2        375 1189 NA NA NA NA NA  1 NA NA       0       NA
##      3       4      382.a 1215 NA NA NA  1 NA NA NA NA      NA        1
##      3      11        397 1278  1 NA NA NA NA NA NA NA      NA        1
##      7       4        726 1543  1 NA NA NA NA NA NA NA      NA        1
##      7       1        728 1550  1 NA NA NA NA NA NA NA       1       NA
##      7       2        754 1660  1 NA NA NA NA NA NA NA       1       NA
##      7       1        779 1815 NA NA NA NA  1  1 NA NA       0       NA
##      9       4        909 1918  1 NA NA NA NA NA NA NA      NA        1
##      9       7        909 1921  1 NA NA NA NA NA NA NA      NA        1
##      9      14        909 1928  1 NA NA NA NA NA NA NA      NA        1
##      9       2        910 1933  1 NA NA NA NA NA NA NA      NA        1
##      9       8      911.a 1942  1 NA NA NA NA NA NA NA      NA        1
##      9       2        915 1964  1 NA NA NA NA NA NA NA      NA        1
##      9       9        923 1990  1 NA NA NA NA NA NA NA      NA        1
##     11       9       1108 2138 NA NA NA NA NA NA  1 NA       0        1
##     11      10       1108 2139 NA NA NA NA NA NA  1 NA       0        1
##     11      13       1108 2142 NA NA NA NA NA NA  1 NA       0        1
##     11      14       1108 2143 NA NA NA NA NA NA  1 NA       0        1
##     11       2     1109.a 2146 NA NA NA NA NA NA  1 NA       0        1
##     12       3       1208 2255  1 NA NA NA NA NA  1 NA      NA        1
##     13       1       1301 2267 NA  1 NA NA NA NA NA NA      NA        1
##     13       3       1301 2269 NA  1 NA NA NA NA NA NA      NA        1
##     13       5       1301 2271 NA NA NA  1 NA NA NA NA      NA        1
##     13       9       1301 2275 NA NA NA NA NA NA  1 NA      NA        1
##     13      13       1301 2279  1 NA NA NA NA NA NA NA      NA        1
##     13      15       1301 2281  1 NA NA NA NA NA NA NA      NA        1
##     13      17       1301 2283  1 NA NA NA NA NA NA NA       0        1
##     13      19       1301 2285  1 NA NA NA NA NA NA NA       0        1
##     13      21       1301 2287  1 NA NA NA NA NA NA NA       0        1
##     13      23       1301 2289  1 NA NA NA NA NA NA NA       0        1
##     14      13       1405 2359  1 NA  1 NA NA NA NA NA       1       NA
##     14       6       1413 2456  1 NA NA NA NA NA NA NA      NA        1
##     15       5     1504.a 2499 NA NA NA NA NA NA  1 NA      NA        1
##     15       5 1504.b.1.2 2510  1 NA NA NA NA NA NA NA      NA       NA
##     15      10       1506 2528  1 NA NA NA NA NA NA NA      NA        1
##     15       1       1509 2533 NA  1 NA NA NA NA NA NA       0       NA
##     15       1     1526.a 2663  1 NA NA NA NA NA NA NA       0        1
##     15       2     1526.a 2664  1 NA NA NA NA NA NA NA      NA        1
##     15       3     1526.a 2665  1 NA NA NA NA NA NA NA      NA        1
##     15       4     1526.a 2666  1 NA NA NA NA NA NA NA      NA        1
##     15       5     1526.a 2667  1 NA NA NA NA NA NA NA      NA        1
##     15       6     1526.a 2668  1 NA NA NA NA NA NA NA      NA        1
##     15       7     1526.a 2669  1 NA NA NA NA NA NA NA      NA        1
##     15       8     1526.a 2670  1 NA NA NA NA NA NA NA      NA        1
##     15       1   1527.a.2 2675 NA  1 NA NA NA NA NA NA       0        1
##     15       2   1527.a.2 2676  1 NA NA NA NA NA NA NA      NA        1
##     15       2     1527.b 2679  1 NA NA NA NA NA NA NA      NA       NA
##     15       1   1527.c.2 2681  1 NA NA NA NA NA NA NA      NA       NA
##     15       2   1527.c.2 2682  1 NA NA NA NA NA NA NA      NA       NA
##     15       3   1527.c.2 2683  1 NA NA NA NA NA NA NA      NA       NA
##     15       4   1527.c.2 2684 NA NA NA NA NA NA  1 NA       0       NA
```

```
##     15       5   1527.c.2 2685  1 NA NA NA NA NA NA NA      NA       NA
##     15       3     1530.e 2786  1 NA NA NA NA NA NA NA      NA        1
##     15       4       1535 2839  1 NA NA NA NA NA NA NA      NA        1
##     15       8       1535 2843  1 NA NA NA NA NA NA NA      NA        1
##     15      11       1535 2846  1 NA  1 NA NA NA NA NA      NA        1
##     15       5     1537.b 2859  1 NA NA NA NA NA NA NA      NA        1
##     15       8     1541.a 2889  1 NA NA NA NA NA NA NA      NA        1
##     15      25     1541.a 2906 NA NA NA  1 NA NA NA NA       0       NA
##     15       1       1548 2931  1 NA  1 NA NA NA NA NA       0       NA
##     15       1     1549.a 2932 NA NA NA NA  1 NA  1 NA       0       NA
##     15       4     1549.b 2940 NA NA  1 NA NA NA NA NA       0       NA
##     15       5     1549.b 2941 NA NA  1 NA NA NA NA NA       0       NA
##     15       1     1550.a 2942 NA NA NA  1 NA NA NA NA       0       NA
##     15       6       1552 2959  1 NA NA NA NA NA NA NA       0       NA
```

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