GATT Analysis

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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. Go back to questions in *Plan.docx* when last three rounds are finished
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. TOT analysis
14. Find implementation years (maybe get answer from Doug Irwin)
15. Get working draft together ASAP
16. Are current Column 2 tariffs in 1962 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~~
9. ~~Read and summarize "Tariff negotiations and renegotiations under the GATT and the WTO" (hard copy at SU library)~~

10. ~~Read through Victor's notes for ideas~~
11. ~~Add Schedule A tariff data from 1946 (last available before Geneva 1947)~~

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 still not as compact and readable as I want it to be. The chunk below calls that program to make the processed data available to the rest of the commands in this document.

Sanity checks

0 rows have either a specific tariff and no unit or a unit with no specific tariff for some round.

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	47.41	6.00	32.0	3000	1554
1946	0	1.54	38.15	5.00	25.0	1600	1540
Geneva	0	1.21	30.50	5.00	25.0	1000	1542
Annecy	0	1.00	29.73	4.00	22.5	1000	1541
Torquay	0	1.00	26.52	3.50	20.0	1000	1541
GenevaA	0	1.00	26.13	3.50	20.0	1000	1541
GenevaB	0	1.00	25.74	3.50	20.0	1000	1541
GenevaC	0	1.00	25.40	3.45	20.0	1000	1538
DillonA	0	1.00	24.30	3.00	19.0	1000	1538
DillonB	0	1.00	23.66	3.00	18.0	1000	1538

Ad valorem tariffs

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

- In Dillon, 1069 rows out of 3030 are missing, so there are 1961 ad valorem tariffs. So 64.72% of lines have *ad valorem* tariffs.

How did liberalization vary across Schedules?

First, descriptions of each schedule:

	Summary Statistics of Ad Valorem Tariffs by Round						
	Min	1st Quartile	Mean	Median	3rd Quartile	Max	N
Smoot Hawley	5.00	25.0	38.92	35.00	50.0	105	1979
1946	2.50	20.0	33.84	30.00	45.0	105	1984
Geneva	2.50	15.0	26.33	22.50	35.0	105	1968
Annecy	2.50	12.5	25.43	20.00	32.5	105	1969
Torquay	1.88	12.5	22.05	18.75	27.5	90	1966
GenevaA	1.88	11.5	21.63	17.50	27.5	90	1966
GenevaB	1.88	11.0	21.41	17.50	27.0	118	1966
GenevaC	1.88	10.5	21.13	17.50	25.5	90	1967
DillonA	1.00	10.5	19.47	15.50	25.0	90	1961
DillonB	0.50	10.0	18.89	15.00	25.0	90	1961

Smoot Hawley Schedule Titles		
Schedule	# Lines	Title
1	398	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	471	Agricultural Products and Provisions
8	35	Spirits, Wines, and other Beverages
9	118	Cotton Manufactures
10	91	Flax, Hemp, Jute, and Manufactures of
11	161	Wool and Manufactures of
12	38	Silk Manufactures
13	48	Manufactures of Rayon or Other Synthetic Textile
14	145	Papers and Books
15	539	Sundries

Summary stats for specific tariffs

The table below is exactly the same as the one above EXCEPT it drops the 212 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

Sched	SH_mean	DB_mean	mean_chg	SH_med	DB_med	med_chg	SH_obs	DB_obs	n
1	22.78	13.31	41.57	5.00	2.50	50.00	265	265	398
2	45.68	26.04	43.00	10.00	5.55	44.50	110	106	243
3	55.01	24.51	55.43	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	28.86	13.34	53.78	3.00	1.50	50.00	356	355	471
8	264.85	78.95	70.19	125.00	42.00	66.40	33	33	35
9	8.60	21.60	-151.14	6.50	15.00	-130.77	8	15	118
10	11.93	4.82	59.62	2.75	1.62	40.91	42	42	91
11	39.83	31.30	21.43	40.00	32.00	20.00	143	143	161
12	NaN	150.00	NaN	NA	150.00	NA	0	1	38
13	40.00	23.18	42.06	45.00	25.00	44.44	34	34	48
14	11.73	12.96	-10.56	5.00	2.00	60.00	84	85	145
15	113.79	56.48	50.36	10.00	7.00	30.00	134	126	539

Sched	SH_mean	DB_mean	mean_chg	SH_med	DB_med	med_chg	SH_obs	DB_obs	n
1	22.90	13.39	41.54	5.00	2.50	50.00	263	263	390
2	53.99	27.41	49.24	10.00	5.25	47.50	90	90	199
3	58.20	21.80	62.54	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	29.10	13.41	53.91	3.00	1.50	50.00	353	353	468
8	264.85	78.95	70.19	125.00	42.00	66.40	33	33	35
9	11.30	6.75	40.23	10.00	6.06	39.38	6	6	91
10	11.93	4.82	59.62	2.75	1.62	40.91	42	42	91
11	39.20	28.38	27.61	40.00	30.00	25.00	130	130	146
12	NaN	NaN	NaN	NA	NA	NA	0	0	35
13	39.13	21.74	44.44	45.00	25.00	44.44	23	23	26
14	11.73	7.17	38.89	5.00	2.00	60.00	84	84	142
15	85.87	50.60	41.08	6.00	4.00	33.33	124	117	504

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

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

Mean and median of specific tariffs in each round

Sched	SH	A	G1	An	To	GC	DB	chgA	chgG1	chgAn	chgTo	chgGC	chgD
1	22.78	21.14	19.15	19.07	15.70	14.83	13.31	7.21	9.43	0.39	17.70	5.52	10.
2	45.68	37.01	33.65	32.63	27.77	26.81	26.04	18.97	9.08	3.02	14.91	3.44	2.
3	55.01	47.71	34.61	34.03	30.96	29.75	24.51	13.27	27.45	1.68	9.03	3.91	17.
4	53.55	43.55	22.61	22.61	22.61	22.61	24.27	18.68	48.08	0.00	0.00	0.00	-7.
5	24.42	23.51	23.36	23.33	23.32	23.31	23.28	3.75	0.63	0.15	0.03	0.02	0.
6	147.50	83.64	94.54	86.42	67.25	62.65	62.19	43.30	-13.04	8.59	22.18	6.85	0.
7	28.86	19.48	15.98	15.80	14.25	14.19	13.34	32.50	17.99	1.11	9.78	0.45	5.
8	264.85	192.65	143.48	125.87	95.87	86.18	78.95	27.26	25.52	12.28	23.83	10.11	8.
9	8.60	6.72	22.38	22.38	21.90	21.90	21.60	21.80	-232.74	0.00	2.12	0.00	1.
10	11.93	7.38	6.76	6.71	4.92	4.91	4.82	38.14	8.39	0.79	26.71	0.12	1.
11	39.83	36.96	29.43	29.33	28.81	28.81	31.30	7.22	20.36	0.36	1.76	0.00	-8.
12	NaN	NaN	150.00	150.00	150.00	150.00	150.00	NaN	NaN	0.00	0.00	0.00	0.
13	40.00	38.53	27.43	26.25	23.75	23.32	23.18	3.68	28.82	4.29	9.52	1.80	0.
14	11.73	19.84	18.54	18.43	16.39	15.04	12.96	-69.23	6.57	0.57	11.10	8.23	13.
15	113.79	83.26	65.52	65.22	61.87	58.10	56.48	26.83	21.31	0.46	5.14	6.09	2.

Sched	Sp_SH	Sp_A	Sp_Ge	Sp_An	Sp_To	Sp_GC	Sp_DB	chgGe	chgAn	chgTo	chgGC	chgDB
1	22.90	21.28	19.33	19.25	15.79	14.92	13.39	15.61	0.39	17.98	5.53	10.25
2	53.99	41.74	36.67	35.47	29.61	28.48	27.41	32.08	3.27	16.53	3.80	3.78
3	58.20	48.11	33.47	32.87	29.85	28.56	21.80	42.49	1.81	9.18	4.30	23.67
4	53.55	43.55	22.61	22.61	22.61	22.61	24.27	57.78	0.00	0.00	0.00	-7.37
5	24.42	23.51	23.36	23.33	23.32	23.31	23.28	4.35	0.15	0.03	0.02	0.16
6	147.50	83.64	94.54	86.42	67.25	62.65	62.19	35.90	8.59	22.18	6.85	0.73
7	29.10	19.59	16.06	15.89	14.33	14.27	13.41	44.80	1.11	9.78	0.46	5.99
8	264.85	192.65	143.48	125.87	95.87	86.18	78.95	45.82	12.28	23.83	10.11	8.39
9	11.30	8.80	7.94	7.94	6.75	6.75	6.75	29.72	0.00	14.95	0.00	0.00
10	11.93	7.38	6.76	6.71	4.92	4.91	4.82	43.33	0.79	26.71	0.12	1.90
11	39.20	36.27	29.26	29.15	28.60	28.60	28.38	25.35	0.39	1.89	0.00	0.77
12	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
13	39.13	37.39	24.67	24.67	21.74	21.74	21.74	36.94	0.00	11.89	0.00	0.00
14	11.73	11.45	10.13	10.02	7.95	7.88	7.17	13.61	1.06	20.67	0.85	9.11
15	85.87	69.77	59.71	59.68	56.08	52.27	50.60	30.47	0.05	6.03	6.80	3.19

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: 507
- Geneva 1947: 484
- Annecy: 484
- Torquay: 481
- Geneva56A: 481
- Geneva56B: 481
- Geneva56C: 479
- DillonA: 473

Sched	SH_mean	DB_mean	mean_chg	SH_med	DB_med	med_chg	SH_obs	DB_obs	n
1	29.90	14.17	52.61	25.00	12.50	50.00	206	205	398
2	45.58	23.93	47.51	50.00	21.00	58.00	163	158	243
3	37.78	17.15	54.60	35.00	13.00	62.86	467	478	661
4	33.91	15.09	55.51	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	31.74	14.22	55.20	35.00	13.00	62.86	119	120	471
8	60.00	30.00	50.00	60.00	30.00	50.00	1	1	35
9	36.99	22.26	39.81	40.00	20.00	50.00	112	105	118
10	37.45	15.09	59.69	40.00	12.50	68.75	58	58	91
11	49.49	24.98	49.53	50.00	23.75	52.50	115	110	161
12	57.50	24.38	57.60	60.00	21.00	65.00	38	37	38
13	52.64	26.47	49.71	57.50	23.25	59.57	36	36	48
14	21.75	8.70	60.01	20.00	8.00	60.00	124	123	145
15	43.77	22.38	48.87	40.00	17.00	57.50	485	475	539

Sched	SH_mean	DB_mean	mean_chg	SH_med	DB_med	med_chg	SH_obs	DB_obs	n
1	29.90	14.04	53.04	25.00	12.50	50.00	198	198	390
2	42.83	21.52	49.77	45.00	20.00	55.56	127	127	199
3	38.29	17.27	54.90	35.00	13.00	62.86	431	442	609
4	33.91	15.09	55.51	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	31.74	14.25	55.09	35.00	13.50	61.43	119	119	468
8	60.00	30.00	50.00	60.00	30.00	50.00	1	1	35
9	35.57	21.45	39.69	35.00	20.00	42.86	87	87	91
10	37.45	15.09	59.69	40.00	12.50	68.75	58	58	91
11	48.99	23.51	52.01	50.00	22.50	55.00	102	102	146
12	57.29	23.20	59.50	60.00	20.00	66.67	35	35	35
13	54.40	25.82	52.54	60.00	22.50	62.50	25	25	26
14	21.55	8.72	59.54	20.00	8.00	60.00	121	121	142
15	44.10	21.73	50.72	40.00	17.00	57.50	450	449	504

- DillonB: 473

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 1079
     8       1       810 1890
```

Sched	SH	G1	An	To	GC	DB	chgG1	chgAn	chgTo	chgGC	chgDB
1	29.90	21.15	20.75	17.02	16.15	14.17	29.26	1.91	17.98	5.11	12.25
2	45.58	30.78	29.33	25.51	25.32	23.93	32.47	4.73	13.02	0.72	5.52
3	37.78	26.50	25.36	20.88	19.87	17.15	29.87	4.29	17.68	4.82	13.69
4	33.91	22.11	20.39	18.80	17.80	15.09	34.81	7.78	7.78	5.32	15.24
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	31.74	20.74	19.45	16.84	15.98	14.22	34.67	6.22	13.39	5.10	11.04
8	60.00	60.00	60.00	30.00	30.00	30.00	0.00	0.00	50.00	0.00	0.00
9	36.99	25.44	25.04	22.92	22.70	22.26	31.21	1.59	8.44	0.96	1.95
10	37.45	19.96	19.74	19.44	18.14	15.09	46.71	1.08	1.53	6.70	16.78
11	49.49	26.27	26.10	24.59	24.02	24.98	46.92	0.66	5.78	2.30	-3.98
12	57.50	36.82	34.05	29.66	27.16	24.38	35.96	7.52	12.90	8.43	10.25
13	52.64	35.00	33.68	28.33	26.79	26.47	33.51	3.77	15.88	5.44	1.19
14	21.75	13.28	12.47	10.91	10.19	8.70	38.96	6.09	12.47	6.61	14.66
15	43.77	31.51	30.75	27.08	25.93	22.38	28.01	2.42	11.92	4.28	13.68

Sched	SH	G1	An	To	GC	DB	chgG1	chgAn	chgTo	chgGC	chgDB
1	29.90	21.10	20.68	16.92	16.02	14.04	29.43	1.97	18.17	5.32	12.39
2	42.83	28.53	26.88	23.01	22.67	21.52	33.39	5.80	14.38	1.51	5.07
3	38.29	27.27	26.15	21.29	20.27	17.27	28.79	4.09	18.60	4.76	14.82
4	33.91	22.11	20.39	18.80	17.80	15.09	34.81	7.78	7.78	5.32	15.24
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	31.74	20.83	19.53	16.90	16.03	14.25	34.39	6.24	13.45	5.12	11.10
8	60.00	60.00	60.00	30.00	30.00	30.00	0.00	0.00	50.00	0.00	0.00
9	35.57	24.77	24.28	22.10	21.84	21.45	30.37	1.97	8.97	1.20	1.76
10	37.45	19.96	19.74	19.44	18.14	15.09	46.71	1.08	1.53	6.70	16.78
11	48.99	26.48	26.28	24.69	24.06	23.51	45.94	0.74	6.05	2.58	2.28
12	57.29	36.36	33.43	28.79	26.14	23.20	36.53	8.06	13.89	9.18	11.26
13	54.40	35.00	35.00	27.60	26.06	25.82	35.66	0.00	21.14	5.58	0.92
14	21.55	13.31	12.49	10.91	10.21	8.72	38.22	6.18	12.66	6.42	14.60
15	44.10	31.18	30.41	26.53	25.34	21.73	29.28	2.47	12.76	4.48	14.25

	Decrease in specific tariffs by round			
	Mean	% decrease	Median	% decrease
Smoot Hawley	47.41	0.00	6.00	0.00
1946	38.15	19.54	5.00	16.67
Geneva	30.50	20.06	5.00	0.00
Annecy	29.73	2.52	4.00	20.00
Torquay	26.52	10.79	3.50	12.50
GenevaA	26.13	1.47	3.50	0.00
GenevaB	25.74	1.48	3.50	0.00
GenevaC	25.40	1.32	3.45	1.43
DillonA	24.30	4.33	3.00	13.04
DillonB	23.66	2.65	3.00	0.00

	Decrease in ad valorem tariffs by round			
	Mean	% decrease	Median	% decrease
Smoot Hawley	38.92	0.00	35.00	0.00
1946	33.84	13.07	30.00	14.29
Geneva	26.33	22.17	22.50	25.00
Annecy	25.43	3.42	20.00	11.11
Torquay	22.05	13.31	18.75	6.25
GenevaA	21.63	1.89	17.50	6.67
GenevaB	21.41	1.01	17.50	0.00
GenevaC	21.13	1.30	17.50	0.00
DillonA	19.47	7.90	15.50	11.43
DillonB	18.89	2.94	15.00	3.23

```
   14       1      1408 2438
   15      17    1532.a 2861
```

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

```
 Sched Product Paragraph   id
     3       1  368.c_18 1079
     8       1       810 1890
    14       1      1408 2438
    15      17    1532.a 2861
```

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
##         41  198       9    60   -25            25                10         2.0
##        212  499      11    NA  -300            60                NA        10.0
##        318  797       1   -50    NA            50                75          NA
##        318  798       2   -50    NA            50                75          NA
##        318  806      10   -50    NA            50                75          NA
##        331  858      10    NA   -50            NA                NA         3.0
##        355  972       8    22  -300            45                35         2.0
##        364 1024       2   -40    NA            50                70          NA
##        389 1252       4   -75    NA            10                18          NA
##        396 1267       1   -44    NA            45                65          NA
##        397 1297      29   -47    NA            45                66          NA
##        397 1301      33   -33    NA            45                60          NA
##      718.a 1487       3   -47    NA            30                44          NA
##      718.a 1488       4   -47    NA            30                44          NA
##      904.a 1905       2  -175    NA            10                28          NA
##      904.b 1911       3  -131    NA            13                30          NA
##      904.c 1915       3  -100    NA            16                32          NA
##      911.a 1953       7   -38    NA            40                55          NA
##   1005.a.3 2045       1    NA   -50            NA                NA         3.2
##       1022 2095       2    NA   -25            NA                NA         8.0
##     1526.a 2691       2  -120    NA            25                55       125.0
```

```
##     1526.a 2692       3  -120    NA            25                55       250.0
##     1526.a 2693       4  -120    NA            25                55       500.0
##     1526.a 2694       5   -90    NA            25                48       600.0
##     1526.a 2695       6   -90    NA            25                48       700.0
##     1526.a 2696       7   -60    NA            25                40       900.0
##     1526.a 2697       8   -60    NA            25                40      1200.0
##   1527.a.2 2703       2   -10    NA            50                55       100.0
##     1527.b 2706       2   -10    NA            50                55         6.0
##   1527.c.2 2708       1   -10    NA            50                55         1.0
##   1527.c.2 2709       2   -30    NA            50                65         1.0
##   1527.c.2 2710       3   -10    NA            50                55         1.0
##     1537.c 2898       2    43   -50            35                20         2.0
##  Specific_Geneva Units_SH Units_Geneva Interval
##              2.5        1            1       NA
##             40.0       20           20        1
##               NA       NA           NA       NA
##               NA       NA           NA       NA
##               NA       NA           NA       NA
##              4.5        1            1       NA
##              8.0       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       NA
##               NA       NA           NA       NA
##               NA       NA           NA       NA
##               NA       NA           NA        1
##              4.9        1            1       NA
##             10.0       44           44       NA
##               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
##              3.0       19           19       NA

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

##  Paragraph   id Product av_pc sp_pc Ad_Valorem_Geneva Ad_Valorem_Annecy
##        385 1241       2     0   -67                10                10
##  Specific_Geneva Specific_Annecy Units_Geneva Units_Annecy Interval
##                6              10            1            1       NA

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

```
##  Paragraph   id Product   av_pc sp_pc Ad_Valorem_Annecy Ad_Valorem_Torquay
##        212  501      13 -100.00    NA              35.0                 70
##        360 1013       6  -50.00    NA              20.0                 30
##        394 1261       2      NA   -12                NA                 NA
##       1013 2062       3  -50.00    NA              15.0                 22
##     1114.d 2208       4   -0.67     0              37.2                 38
##       1405 2375       3  -33.33     0               7.5                 10
##       1405 2385      13    0.00   -50              10.0                 10
##     1519.b 2661       1  -12.50    NA              20.0                 22
##     1530.c 2803       5  -50.00    NA              10.0                 15
##     1537.b 2891       8  -25.00    NA              10.0                 12
##  Specific_Annecy Specific_Torquay Units_Annecy Units_Torquay Interval
##              5.0               NA         20.0            NA        1
##               NA               NA           NA            NA       NA
##              1.0              1.1          1.0             1       NA
##               NA               NA           NA            NA       NA
##             37.5             37.5          1.0             1       NA
##              2.5              2.5          1.0             1       NA
##              1.0              1.5          0.5             1       NA
##               NA               NA           NA            NA       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  411       7  -20.0    NA                 35                   42
##      202.a  412       8     NA -20.0                 NA                   NA
##      202.a  413       9  -20.0    NA                 25                   30
##      202.a  414      10   -7.1    NA                 28                   30
##      202.a  415      11     NA  -6.2                 NA                   NA
##      202.a  416      12   -5.0    NA                 20                   21
##      202.a  418      14  -18.3    NA                 30                   36
##      202.a  419      15   -6.2    NA                 24                   26
##        209  475       6  -71.4    NA                 18                   30
##        212  494       6  -71.4    NA                 35                   60
##        214  515       7  -70.0    NA                 20                   34
##      302.b  651       1     NA -71.4                 NA                   NA
##        357  984       1 -122.2    NA                 22                   50
##        357  985       2 -122.2    NA                 22                   50
##        360 1008       1  -13.3    NA                 22                   26
##        411 1332       4  -70.0    NA                 25                   42
##        701 1392       8     NA -66.7                 NA                   NA
##        778 1824       1 -112.5    NA                  8                   17
##     1114.d 2207       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
##               NA                 NA           NA               NA       NA
##             17.5               30.0            1                1       NA
##              1.8                 NA           19               NA       NA
##              7.5                 NA           19               NA       NA
##               NA                 NA           NA               NA       NA
##               NA                 NA           NA               NA       NA
##              6.0               10.0            1                1       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  414      10  -30.0    NA                  30.0                  39
##      202.a  415      11     NA   -32                    NA                  NA
##      202.a  416      12  -33.3    NA                  21.0                  28
##        209  471       2  -37.1    NA                   8.8                  12
##        209  476       7  -55.6    NA                  22.5                  35
##        331  857       9     NA   -20                    NA                  NA
##        354  952       1  -70.0    68                  25.0                  42
##        354  953       2  -70.0    68                  25.0                  42
##        354  954       3  -54.5    67                  27.5                  42
##        354  961      10  -54.5    67                  27.5                  42
##        354  962      11  -54.5    72                  27.5                  42
##        354  963      12  -70.0    80                  25.0                  42
##        354  964      13  -54.5    86                  27.5                  42
##        365 1033       9  -18.4   -18                  19.0                  22
##        371 1098       2     NA   -50                    NA                  NA
##        371 1099       3  -50.0    NA                  15.0                  22
##        371 1101       5     NA   -50                    NA                  NA
##        371 1102       6  -50.0    NA                  15.0                  22
##        371 1103       7  -50.0    NA                  15.0                  22
##        371 1104       8     NA   -50                    NA                  NA
##        371 1105       9  -50.0    NA                   7.5                  11
##        371 1107      11     NA   -50                    NA                  NA
##        371 1108      12  -50.0    NA                  15.0                  22
##        372 1115       3  -33.3    NA                  10.5                  14
##        411 1331       3  -36.0    NA                  25.0                  34
##        412 1339       7     NA  -100                    NA                  NA
##      721.e 1532       1     NA   -12                    NA                  NA
##       1014 2069       6 -300.0    NA                   2.5                  10
##       1108 2162       7 -140.0     0                  25.0                  60
##       1108 2163       8 -140.0     0                  25.0                  60
##       1108 2164       9     NA  -260                  25.0                  NA
##       1108 2165      10     NA  -260                  25.0                  NA
##       1108 2166      11  -52.0     0                  25.0                  38
##       1108 2167      12 -140.0     0                  25.0                  60
##       1108 2168      13     NA  -203                  25.0                  NA
##       1108 2169      14     NA  -203                  25.0                  NA
##       1108 2170      15  -52.0     0                  25.0                  38
##     1109.a 2171       1 -140.0     0                  25.0                  60
##     1109.a 2172       2     NA  -203                  25.0                  NA
```

```
##     1109.a 2173       3  -52.0     0                  25.0                  38
##     1109.a 2174       4  -50.0     0                  20.0                  30
##     1109.a 2175       5  -50.0     0                  20.0                  30
##     1109.a 2176       6  -50.0     0                  20.0                  30
##       1404 2363       9   -6.7    20                   7.5                   8
##     1549.a 2963       1   20.0 -7995                  12.5                  10
##       1551 2982       7     NA   -60                    NA                  NA
##       1551 2983       8     NA   -60                    NA                  NA
##  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
##                   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
```

```
##              2.50              2.0                1              1       NA
##              0.21             17.0                1             18       NA
##              0.50              0.8               55             55       NA
##              1.50              2.4               55             55       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 333 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

```
# we removed the "before" variables once we verified that they were exactly the same as Smoot Hawley
# all the lines that are exactly the same in Smoot Hawley and 1946_before
#same <- shortnames %>%
#         filter( ((is.na(Sp_SH) == is.na(Sp_B) & is.na(Sp_SH)) | Sp_SH == Sp_B)
#                 & ((is.na(AV_SH) == is.na(AV_B) & is.na(AV_SH)) | AV_SH == AV_B)
#                 & ((is.na(Un_SH) == is.na(Un_B) & is.na(Un_SH)) | Un_SH == Un_B))


# 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 1020 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.

In all, 117 lines are affected by some change in the form of the tariff.

```
##  Sched Product  Paragraph   id  G  A  T GA GB GC DA DB Interval
##      1      16       28.a  148 NA NA NA NA NA NA NA NA        1
##      1      10         53  253  1 NA  1 NA NA NA NA NA        1
##      1       6         72  325 NA NA NA NA NA NA NA NA        1
##      2      11        207  451  1 NA NA NA NA NA NA NA       NA
##      2       4        210  480  1 NA NA NA NA NA NA NA        1
##      2       2        212  490 NA NA NA NA NA NA NA NA        1
##      2       3        212  491 NA NA  1 NA NA NA NA NA        1
##      2       4        212  492 NA NA NA NA NA NA NA NA        1
##      2      10        212  498  1 NA NA NA NA NA NA NA        1
##      2      11        212  499  1 NA NA NA NA NA NA NA        1
##      2      12        212  500  1 NA NA NA NA NA NA NA        1
##      2      13        212  501 NA NA  1 NA NA NA NA NA        1
##      2      14        212  502 NA NA  1 NA NA NA NA NA        1
##      2      15        212  503 NA NA NA NA NA NA NA NA        1
##      2       4        213  507 NA NA NA NA NA NA NA NA        1
##      2       2      218.d  536  1 NA  1 NA NA NA NA NA        1
##      2       5      218.d  539  1 NA NA NA NA NA NA NA        1
##      2       7      218.f  555  1 NA NA NA NA NA NA NA        1
##      2      11      218.f  559 NA NA NA NA NA NA  1 NA        1
##      2       4        226  593 NA NA NA NA NA NA NA NA        1
##      3       3      302.d  655 NA NA  1 NA NA NA NA NA       NA
##      3       3        304  694 NA NA NA NA NA NA NA NA        1
##      3       4        304  695 NA NA NA NA NA NA NA NA        1
##      3       5        304  696 NA NA NA NA NA NA NA NA        1
##      3      11        304  702 NA NA NA NA NA NA NA NA        1
##      3      12        304  703 NA NA NA NA NA NA NA NA        1
##      3      13        304  704 NA NA NA NA NA NA NA NA        1
##      3      21        304  712 NA NA NA NA NA NA NA NA       NA
##      3      22        304  713 NA NA NA NA NA NA NA NA       NA
##      3      23        304  714 NA NA NA NA NA NA NA NA       NA
##      3      24        304  715  1 NA NA NA NA NA NA NA       NA
##      3      25        304  716 NA NA NA NA NA NA NA NA       NA
##      3      26        304  717  1 NA NA NA NA NA NA NA       NA
##      3      30        304  721 NA NA NA NA NA NA NA NA       NA
##      3      38        304  729 NA NA NA NA NA NA NA NA        1
##      3      39        304  730 NA NA NA NA NA NA NA NA        1
##      3      40        304  731 NA NA NA NA NA NA NA NA        1
##      3      41        304  732 NA NA NA NA NA NA NA NA        1
##      3      46        304  737 NA NA NA NA NA NA NA NA       NA
##      3      47        304  738 NA NA NA NA NA NA NA NA       NA
```

```
##      3      48        304  739 NA NA NA NA NA NA NA NA       NA
##      3       1        308  750  1 NA  1 NA NA NA NA NA        1
##      3       3        308  752  1 NA  1 NA NA NA NA NA        1
##      3      12      316.a  791 NA NA NA NA NA NA NA NA        1
##      3       4        318  800 NA NA NA NA NA NA NA NA        1
##      3       7        318  803 NA NA NA NA NA NA NA NA        1
##      3       1        357  984 NA NA NA NA NA  1 NA NA       NA
##      3       2        357  985 NA NA NA NA NA  1 NA NA       NA
##      3       7        358  997  1 NA NA NA NA NA NA NA        1
##      3      16        365 1040 NA NA NA NA NA NA  1 NA       NA
##      3      18        365 1042 NA NA NA NA NA NA  1 NA       NA
##      3       1    368.c_2 1062 NA NA NA NA NA NA  1 NA       NA
##      3       2    368.c_2 1063 NA NA NA NA NA NA  1 NA       NA
##      3       1   368.c_17 1078 NA NA  1 NA NA NA NA NA       NA
##      3       2        371 1098 NA NA NA NA NA NA NA NA        1
##      3       5        371 1101 NA NA NA NA NA NA NA NA        1
##      3       8        371 1104 NA NA NA NA NA NA NA NA        1
##      3      11        371 1107  1 NA NA NA NA NA NA NA        1
##      3      14        371 1110 NA NA NA NA NA NA NA NA        1
##      3       2        375 1190 NA NA NA NA NA  1 NA NA       NA
##      3       4      382.a 1216 NA NA NA NA NA NA NA NA        1
##      3      11        397 1279 NA NA NA NA NA NA NA NA        1
##      7       1        723 1537  1 NA NA NA NA NA NA NA       NA
##      7       4        726 1546 NA NA NA NA NA NA NA NA        1
##      7       3        742 1606  1 NA NA NA NA NA NA NA       NA
##      7       4        742 1607  1 NA NA NA NA NA NA NA       NA
##      7       2        754 1664  1 NA NA NA NA NA NA NA       NA
##      7       4        762 1703  1 NA NA NA NA NA NA NA       NA
##      7       1        779 1825 NA NA NA NA  1  1 NA NA       NA
##      9       4        909 1930  1 NA NA NA NA NA NA NA        1
##      9       7        909 1933  1 NA NA NA NA NA NA NA        1
##      9      14        909 1940  1 NA NA NA NA NA NA NA        1
##      9       2        910 1945  1 NA NA NA NA NA NA NA        1
##      9       8      911.a 1954  1 NA NA NA NA NA NA NA        1
##      9       2        915 1976  1 NA NA NA NA NA NA NA        1
##      9       9        923 2004  1 NA NA NA NA NA NA NA        1
##     11       9       1108 2164 NA NA NA NA NA NA  1 NA        1
##     11      10       1108 2165 NA NA NA NA NA NA  1 NA        1
##     11      13       1108 2168 NA NA NA NA NA NA  1 NA        1
##     11      14       1108 2169 NA NA NA NA NA NA  1 NA        1
##     11       2     1109.a 2172 NA NA NA NA NA NA  1 NA        1
##     12       3       1208 2285  1 NA NA NA NA NA NA NA        1
##     14      13       1405 2385  1 NA  1 NA NA NA NA NA       NA
##     14       6       1413 2482 NA NA NA NA NA NA NA NA        1
##     15       5     1504.a 2525 NA NA NA NA NA NA NA NA        1
##     15       5 1504.b.1.2 2536  1 NA NA NA NA NA NA NA       NA
##     15      10       1506 2554 NA NA NA NA NA NA NA NA        1
##     15       1       1509 2559 NA  1 NA NA NA NA NA NA       NA
##     15       1     1526.a 2690  1 NA NA NA NA NA NA NA        1
##     15       2     1526.a 2691  1 NA NA NA NA NA NA NA        1
##     15       3     1526.a 2692  1 NA NA NA NA NA NA NA        1
##     15       4     1526.a 2693  1 NA NA NA NA NA NA NA        1
##     15       5     1526.a 2694  1 NA NA NA NA NA NA NA        1
##     15       6     1526.a 2695  1 NA NA NA NA NA NA NA        1
```

```
##     15       7     1526.a 2696 NA NA NA NA NA NA NA NA        1
##     15       8     1526.a 2697 NA NA NA NA NA NA NA NA        1
##     15       9     1526.a 2698  1 NA NA NA NA NA NA NA       NA
##     15       1   1527.a.2 2702 NA  1 NA NA NA NA NA NA        1
##     15       2   1527.a.2 2703  1 NA NA NA NA NA NA NA        1
##     15       2     1527.b 2706  1 NA NA NA NA NA NA NA       NA
##     15       1   1527.c.2 2708  1 NA NA NA NA NA NA NA       NA
##     15       2   1527.c.2 2709  1 NA NA NA NA NA NA NA       NA
##     15       3   1527.c.2 2710  1 NA NA NA NA NA NA NA       NA
##     15       4   1527.c.2 2711 NA NA NA NA NA NA  1 NA       NA
##     15       5   1527.c.2 2712  1 NA NA NA NA NA NA NA       NA
##     15       3     1530.e 2814 NA NA NA NA NA NA NA NA        1
##     15       4       1535 2868  1 NA NA NA NA NA NA NA        1
##     15       8       1535 2872  1 NA NA NA NA NA NA NA        1
##     15      11       1535 2875  1 NA  1 NA NA NA NA NA        1
##     15       5     1537.b 2888  1 NA NA NA NA NA NA NA        1
##     15       8     1541.a 2918  1 NA NA NA NA NA NA NA        1
##     15      25     1541.a 2935 NA NA NA  1 NA NA NA NA       NA
##     15       1       1548 2962  1 NA  1 NA NA NA NA NA       NA
##     15       1     1549.a 2963 NA NA NA NA  1 NA  1 NA       NA
##     15       4     1549.b 2971 NA NA  1 NA NA NA NA NA       NA
##     15       5     1549.b 2972 NA NA  1 NA NA NA NA NA       NA
##     15       1     1550.a 2973 NA NA NA  1 NA NA NA NA       NA
```

Summarizing the impact of tax intervals

PUT THIS BACK IN WHEN I'M AT HOME AND CAN FIGURE OUT THE BETTER WAY TO WORK WITH THE 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