Sources of Variation in Real Tariff Rates: The United States, 1900-1940

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By MARIO J. CRUCINI *

During the 1930's, commercial policy and international trade underwent rapid and dramatic change. Tariff levels in the United States reached heights described by Gottfried Haberler (1976) as "skyscraper duties," foreign countries retaliated (see e.g., Joseph M. Jones, 1934), and the volume of international trade fell precipitously.[1] The connection between these events and the internationalization of the U.S. depression remains the subject of considerable debate.

While trade theorists point to this episode as a classic example of beggar-thy-neighbor commercial policy, macroeconomists disagree about the role of the tariff war in the propagation of the world depression. Opinions range from Rudiger Dornbusch and Stanley Fischer's (1986) denial that the Hawley-Smoot Tariff Act was a "macroeconomic phenomenon," to Alan Meltzer's (1976) claim that Hawley-Smoot was a key contributor to the propagation of the Great Depression.

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[1]Total imports of 75 countries fell from $3 billion (in old U.S. gold dollars) to $1 billion between January 1929 and 1933, while nominal income in major industrial countries fell by less than 50 percent over the same period (Charles P. Kindleberger, 1973 p. 172).

An essential part of interwar tariff history has been ignored in this debate. During the period from 1900 to 1940, many customs duties were specific, calling for a fixed nominal levy per physical unit imported. Under a specific duty, a decline in the nominal price of the import good causes an increase in the tariff as a percentage of the price of the good.[2] As is well known, the nominal price level changed dramatically during these years, a period which includes the inflation of World War I and the deflation of the 1930's.

This study carefully measures the impact of legislation and the price level on ad valorem equivalent tariff rates using time-series data on individual imported commodities. The tariff history that emerges from this study is remarkably different from that which has previously been told. I find that monetary policy, through its influence on nominal prices and therefore on the real value of specific duties, had larger effects on ad valorem equivalent tariff rates than did legislative amendments. This adds an intriguing dimension to the Friedman-Schwartz thesis that the depression was a monetary phenomenon, suggesting a novel deflationary channel by which the depression was internationalized.

I. Data

The data are compiled from the annual serial *The Foreign Trade and Navigation of the United States* (U.S. Department of Commerce, 1903–1940) and include the following: the physical quantity imported, the

[2]This problem is mentioned by Dornbusch and Fischer (1986 p. 469) and Barry Eichengreen (1989 p. 15).

TABLE 1—COMPARISON OF AGGREGATE U.S. DATA AND PANEL DATA SET IN 1929

Tariff schedule	Share of dutiable imports			Ad valorem equivalent tariff		
	Aggregate U.S. data	Panel data set	Percentage covered	Aggregate U.S. data	Panel data set	Percentage difference
Sugar, molasses, and manufactures thereof	10.7	9.4	87.6	84.0	93.7	−11.5
Tobacco and manufactures thereof	4.1	4.0	96.7	65.1	64.8	0.4
Manufactures of cotton	2.9	0.1	3.2	36.5	29.4	19.3
Sundries	16.5	4.1	24.5	37.6	26.1	30.5
Agricultural products and provisions	20.4	5.0	24.5	22.9	25.8	−12.4
Earths, earthenware, glassware	3.8	0.2	4.9	48.9	23.2	52.6
Metals and manufactures thereof	10.6	0.1	1.0	35.5	18.7	47.2
Chemicals, oils, and paints	7.6	0.4	5.9	30.7	18.3	40.6
Flax, hemp, jute, and manufactures thereof	8.9	5.3	59.5	19.0	8.3	56.2
Wood and manufactures thereof	1.2	0.0	0.0	24.7	NA	NA
Paper and books	1.7	0.0	0.0	25.3	NA	NA
Wool and manufactures thereof	8.3	0.0	0.0	50.8	NA	NA
Manufactures of silk and rayon	3.2	0.0	0.0	58.0	NA	NA
Spirits, wines, and other beverages	0.1	0.0	0.0	34.6	NA	NA
All schedules:	100.0	28.6	28.6	40.1	49.7	−23.8

Note: NA indicates that the information is not available; no commodity in this group is included in the data set.
Source: Statistical Abstract of the United States (U.S. Department of Commerce, 1932).

nominal value of imports, the ad valorem equivalent rate of duty, and the legislated rate of duty. Value of imports is measured as the foreign value or export value, whichever is higher, converted to U.S. dollars at the prevailing exchange rate.[3]

In 1929, approximately 4,600 dutiable imports entered the United States. I used two selection criteria to reduce the panel data set to a manageable size. I required that the value of imports in 1929 exceed one million dollars and that the categorical definition of each commodity be maintained over the entire sample period.

The first constraint produced a sample of more than 70 commodities. The second criterion was satisfied for only 29 of these because legislative changes frequently involved alterations in tariff categories. Overall, the selection process resulted in surprisingly few commodities subject to pure ad valorem duties. To make the data set more representative of the aggregate data, cigarette papers, diamonds, and soap were added. These commodities were the largest imports, in terms of value in 1929, subject to pure ad valorem duties while also satisfying the second criterion. The final data set consists of 32 individual imported commodities, and the sample period runs from 1903 to 1940.[4]

Table 1 reveals the basic difficulty in representing thousands of dutiable imports with a modest-sized cross section. While the sample includes commodities from nine of the 14 tariff schedules and covers more than 20 percent of the value of dutiable imports

[3]Foreign value is defined as "...the market value or price at which the merchandise, at the time of exportation to the U.S. is offered for sale in the principal markets of the country from which exported, including the costs of containers or coverings and all expenses incident to placing the merchandise in condition ready for shipment to the U.S. as defined in section 402 of the tariff Acts of 1922 and 1930" (quoted from the preface of *Foreign Trade and Navigation of the United States* [U.S. Department of Commerce, 1903–1940]).

[4]The peculiar starting date was determined by library resources that had some gaps in the set of *Foreign Trade and Navigation of the United States* volumes. It is feasible, using a complete Congressional set of these volumes, to extend the sample period both forward and backward in time.

in five cases, four categories are not represented at all. However, the excluded schedules, taken together, account for less than 15 percent of total U.S. dutiable imports. In terms of tariff levels, the ad valorem equivalent tariff rates are typically underestimated by the panel data set, with the exception of sugars and agricultural products.

II. Sources of Variation in Real Tariff Rates

Early tariff history is complicated by the use of three types of duties: specific, ad valorem, or the two in combination. A specific duty taxes the physical quantity imported at a nominal rate, in contrast to the more familiar ad valorem duty which is levied as a percentage of the value imported. The price faced by domestic consumers will differ from the world price by the amount of the ad valorem equivalent tariff rate.

To define this ad valorem equivalent rate, let P_{jt} denote the nominal price of commodity j, in domestic currency, in period t, and let Q_{jt} denote the physical quantity imported. Let τ_{js} denote the ad valorem rate of duty, and let ω_{js} denote the specific duty, on commodity j, as legislated in period s, which might be some periods earlier. The ad valorem equivalent rate of duty is constructed by dividing customs duties collected, C_{jt}, by the value of imports. For a commodity subject to a combined duty the ad valorem equivalent rate is

$$(1) \qquad \tau_{jt}^{*} = \frac{C_{jt}}{P_{jt}Q_{jt}} = \tau_{js} + \frac{\omega_{js}}{P_{jt}}.$$

The ad valorem equivalent rate, denoted τ_{jt}^{*}, is the sum of the ad valorem duty and the specific duty converted to an equivalent rate at the current price of the good.

The existing tariff literature focuses on the infrequent alterations in legislated duties, ignoring the continuous changes that arise as fluctuations in the nominal import price alter the real value of the specific duty. This section studies the impact of nominal prices on ad valorem equivalent tariff rates, adding an important chapter to U.S. tariff history.[5]

Toward this end, let P_t denote the import price index in period t. Equation (2) below uses this and earlier definitions to decompose movements in an ad valorem equivalent tariff rate into three components: (i) a component due to legislation (T_{js}^{L}); (ii) a component arising from movements in the import price index (T_{jt}^{P}); and (iii) a component attributable to movements in the relative price of the imported commodity (T_{jt}^{RP}):

$$(2) \quad \tau_{jt}^{*} = \left[\tau_{js} + \frac{\omega_{js}}{P_{js-1}}\right] + \left[\frac{\omega_{js}}{P_{js-1}}\left(\frac{P_s}{P_t} - 1\right)\right] + \left[\frac{\omega_{js}}{P_{js-1}}\left(\frac{P_{js-1}}{P_{jt}} - \frac{P_s}{P_t}\right)\right] \equiv T_{js}^{L} + T_{jt}^{P} + T_{jt}^{RP}.$$

Lagged prices were used in the above decomposition because tariff revisions often took a year or more from initial discussion to final implementation.

For a pure ad valorem duty, only the term τ_{js} is nonzero. In such a case, ad valorem equivalent rates and ad valorem duties coincide; the tariff rate jumps discretely at legislative dates and remains constant at all other dates. Ad valorem equivalent tariff rates will fluctuate continuously when specific duties are present, reflecting the interaction of all three components in equation (2).

A. *A Tale of Two Histories*

In this subsection, I present two alternative histories implied by the tariff decomposition: a history focusing on legislative

[5]Many of the contemporary tariff studies discuss specific duties across distant years without conversion to an ad valorem equivalent rate. See, for examples, the classic (and voluminous) work by Frank Taussig (1931) and the comparative analyses of adjacent pieces of tariff legislation by Taussig (1922) and Abraham Berglund (1923, 1930).

amendments, following the practice of previous research, and a second history incorporating the fact that many legislated duties were nominally denominated.

Ordered from top to bottom, Figure 1 presents decompositions of ad valorem equivalent tariff rates for bristles, china clay, ostrich feathers, and flaxseed. The left-hand panel presents the ad valorem equivalent rate (solid line) and legislative component (dashed line), while the right-hand panel gives the price-level component (solid line) and relative-price component (dashed line).

The legislated duties declined in real terms, in two steps, for both bristles and china clay. As a rule of thumb, the ad valorem equivalent tariff rate on china clay is 3–4 times that on bristles. This rule of thumb fails miserably in the early 1930's. In 1932 the ad valorem equivalent tariff rate on china clay is ten times that on bristles. Sharp relative price movements account for the observed changes in relative protection across the two imports. The increasing relative price of bristles (relative to the import price index) decreases the real tariff rate on bristles, while the declining relative price of china clay increases the real tariff rate on china clay. The legislative history indicates modest changes in relative protection across the two commodities, which is obviously wrong for the 1930's.

The figures for ostrich feathers and flaxseed provide a perfect contrast between ad valorem and specific duties. Ostrich feathers were subject to a pure ad valorem tariff over the entire sample, increasing from 15 percent to 20 percent in 1910.

In contrast, flaxseed was subject to a nominal specific rate per bushel throughout the period. The specific duty changed from 25 cents in 1903 to 20 cents in 1914, to 30 cents in 1921, to 40 cents in 1922, to 56 cents in 1929, and finally to 65 cents in 1930. It is interesting to note that, despite the substantial (50-percent) nominal increase in the specific duty from 1914 to 1921, the ad valorem equivalent tariff rate actually declined.

Frequent legislative changes in the specific duty keep the legislative and ad valorem equivalent paths close until the early 1930's. By 1932, however, the ad valorem equivalent rate is three times the rate legislated in 1930. The modest changes in tariff rates indicated by the legislative history are dwarfed by the influences of nominal and relative prices in the 1930's.

The tariff histories of bristles, china clay, ostrich feathers, and flaxseed, are typical of other commodities in the data set. The view that legislative amendments are the only source of tariff variation leads one to underestimate the volatility of the ad valorem equivalent rates on individual commodities and masks the movements in relative tariff rates as measured by their ad valorem equivalents.

B. *Extremes of Protection*

The time-series decompositions presented in the previous subsection uncovered large discrepancies between ad valorem equivalent tariff rates and initial legislated rates. This subsection examines the contribution of legislation and price changes to the variation in ad valorem equivalent tariff rates in two ways. First, I compare *levels* of protection at dates of legislative amendment to the maximum and minimum levels achieved from 1914 to 1933. Second, I look at *changes* in ad valorem equivalent tariff rates and compare legislative influences to price-induced changes.

The Underwood Act of 1914 reduced tariff rates, on average. The first question I consider is whether World War I inflation reduced ad valorem equivalent tariff rates significantly beyond the levels achieved by the Underwood Act. The Hawley-Smoot Tariff Act of 1930 is considered the high-water mark in the tariff history of the United States. The second question addressed is whether the deflation of the early 1930's added much to the increases attributable to Hawley-Smoot.

Table 2 examines the extremes of protection for each commodity in the panel data set. The first two columns report the year and the level of the lowest tariff rate between 1914 and 1928. The last two columns report the year and the level of the highest tariff rate between 1929 and 1933. The

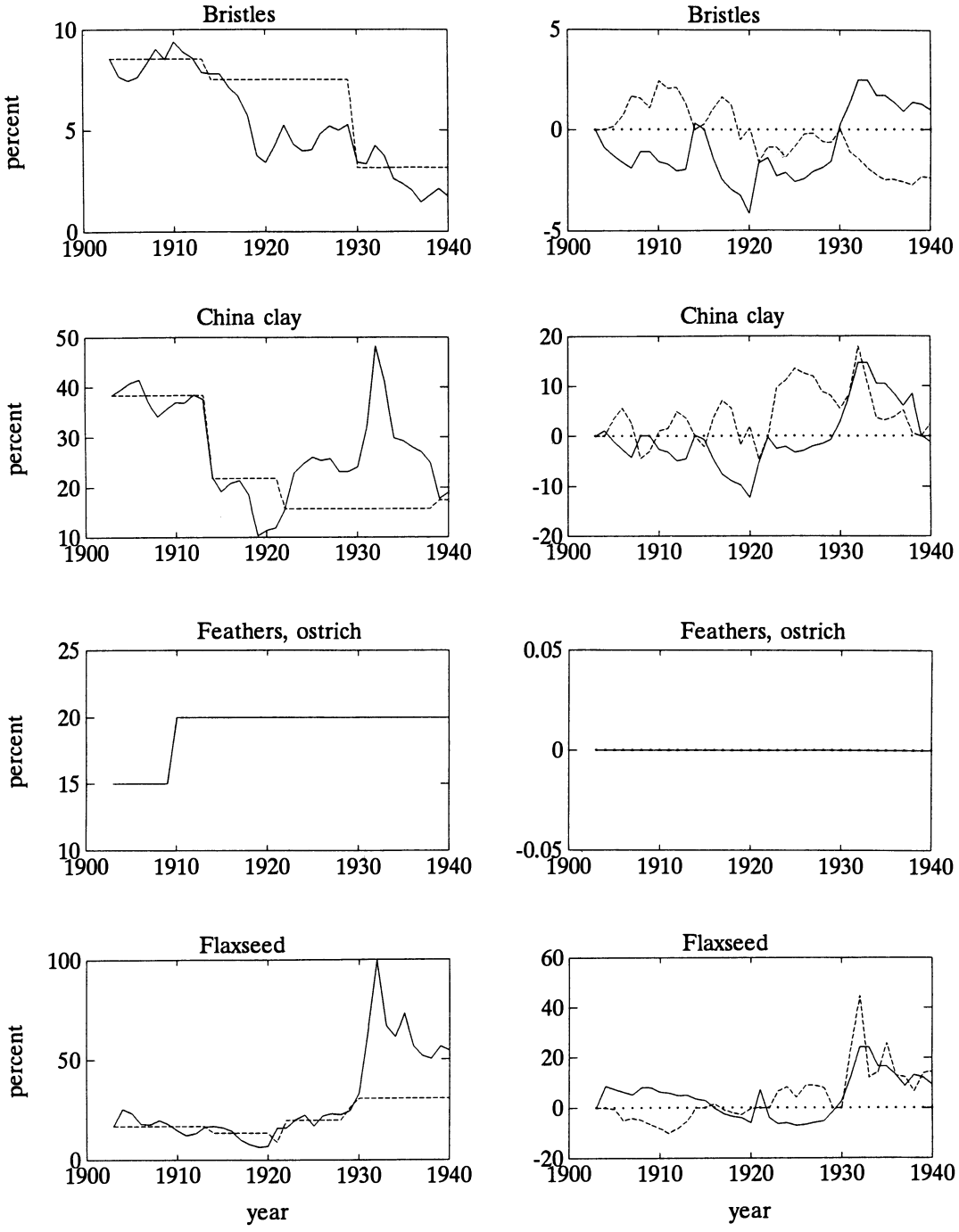

FIGURE 1. AD VALOREM TARIFF RATE DECOMPOSITIONS

Notes: The left-hand panels show the ad valorem equivalent tariff rate (solid line) and the legislative component (dashed line); the right-hand panels show the price-level component (solid line) and the relative-price component (dashed line).

TABLE 2—EXTREMES OF PROTECTION

Commodity	1914–1928 Minimum Year	1914–1928 Minimum Tariff	Underwood	1929–1933 Hawley-Smoot	1929–1933 Maximum Tariff	1929–1933 Maximum Year
Almonds	1920	10.4	14.4	51.9	90.0	1932
Brazil and cream	1920	7.5	17.1	10.7	39.9	1933
Bristle	1920	3.4	7.8	3.4	5.3	1929
Burlap	1915	0.0	3.8	11.0	20.2	1932
Castor beans	1919	4.9	14.0	16.3	29.9	1933
China clay	1919	10.3	22.0	24.0	48.3	1932
Cigar and cheroots	1927	59.7	80.7	62.8	76.3	1931
Cigar filler, Cuban, stemmed	1922	40.6	92.1	62.4	87.0	1933
Cigar filler, unstemmed	1921	26.3	47.8	38.3	61.8	1933
Cigar filler, Cuban, unstemmed	1921	30.0	58.9	46.4	56.3	1933
Cigar leaf	1924	83.7	137.4	126.8	184.2	1932
Cigarette paper	1915	50.0	52.6	60.0	60.0	1929
Coconuts	1914	0.0	0.0	24.8	34.9	1933
Dates	1920	15.7	51.7	24.5	35.2	1933
Diamonds	1914	15.4	15.4	20.0	20.0	1929
Egg yolk, dried	1914	10.0	10.0	46.9	292.2	1933
Egg yolk, other	1914	10.0	10.0	35.3	136.4	1933
Feathers, for beds	1914	20.0	20.0	20.0	20.0	1929
Feathers, ostrich	1914	20.0	20.0	20.0	20.0	1929
Flaxseed	1919	6.3	16.7	33.2	99.5	1932
Matches in boxes	1918	4.9	17.6	30.3	76.3	1933
Mercury	1915	10.0	11.0	19.5	68.9	1932
Quebracho	1915	0.0	2.1	15.0	15.0	1929
Soap, Castille	1915	10.0	11.5	15.0	15.0	1929
Sugar, Cuban, 95°	1920	8.3	57.4	127.3	217.0	1932
Sugar, Cuban, 96°	1920	8.8	60.9	127.6	223.2	1932
Sugar, Cuban, 97°	1920	8.3	67.1	96.7	220.4	1933
Sugar, Cuban, 100°	1914	0.0	0.0	92.8	140.8	1932
Toilet water	1915	30.0	37.6	30.0	30.0	1929
Tracing cloth	1927	29.3	33.6	29.7	32.7	1932
Vanilla beans	1914	4.6	4.6	20.2	50.2	1933
Walnuts, shelled	1919	7.8	18.4	51.2	101.6	1933

Note: The reference years for the Underwood and Hawley-Smoot tariffs are 1914 and 1930, respectively.

two middle columns report the tariff levels in 1914 and 1930, the years in which the Underwood Tariff Act and the Hawley-Smoot Tariff Act were passed into law.

Table 2 clearly shows that the extremes of protection followed the inflation of World War I and the deflation of the interwar period. In 17 of 32 cases, the lowest tariff rates were achieved between 1919 and 1927, rather than at the time the Underwood Act was passed into law. The highest tariff levels occurred, almost exclusively (23 of 32 cases), in 1932 or 1933. Only a single tariff rate reached its peak in 1931, and none did so in 1930. On average, Hawley-Smoot increased ad valorem equivalent tariff rates by a factor of 2 over the levels legislated in 1914, though 10 ad valorem equivalent rates actually declined. Comparing the minimum and maximum levels achieved from 1914 to 1933, tariffs, on average, increased by a factor of 8. Thus the estimated swing in tariff levels during the interwar period is mismeasured by a factor of 4 when the influence of the price level is ignored.

Table 3 decomposes the sample path of ad valorem equivalent tariff rates into legislative changes and intervening effects of

TABLE 3—SOURCES OF VARIATION IN AD VALOREM EQUIVALENT TARIFF RATES

Commodity	Legislative changes				Price-induced changes			
	1914	1922	1930	Totals	1915–1920	1923–1929	1931–1933	Totals
Almonds	−10.7	12.0	12.2	13.5	−4.0	−22.5	32.3	5.8
Brazil and cream	17.1	14.4	−0.4	31.2	−9.6	−5.5	29.2	14.1
Bristle	−0.1	1.9	−1.8	−0.1	−4.4	1.0	0.3	−3.1
Burlap	−17.5	2.7	2.7	−12.1	−3.8	−0.6	5.4	1.0
Castor beans	−8.4	5.7	2.2	−0.5	−7.6	−0.5	13.6	5.5
China clay	−15.6	4.2	0.9	−10.5	−10.7	0.3	17.0	6.6
Cigar and cheroots	1.2	3.2	0.7	5.2	−17.6	−3.4	5.2	−15.7
Cigar filler, Cuban, stemmed	15.4	−0.5	0.2	15.2	−51.0	16.4	24.6	−10.0
Cigar filler, unstemmed	−1.9	5.7	1.0	4.8	−20.3	5.0	23.5	8.2
Cigar filler, Cuban, unstemmed	−3.9	3.4	2.2	1.7	−25.5	7.4	9.9	−8.3
Cigar leaf	−9.7	−9.2	17.3	−1.6	−20.6	18.4	27.1	24.8
Cigarette paper	−7.4	1.1	0.0	−6.3	−2.6	0.0	0.0	−2.6
Coconuts	0.0	9.6	3.2	12.7	0.0	1.3	10.2	11.4
Dates	0.5	4.0	4.0	8.5	−36.0	−0.3	10.7	−25.6
Diamonds	5.4	0.0	0.0	5.4	4.6	0.0	0.0	4.6
Egg yolk, dried	0.0	0.0	8.6	8.6	0.0	−23.1	245.3	222.1
Egg yolk, other	0.0	38.0	4.5	42.5	0.0	−9.4	101.1	91.7
Feathers, for bed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Feathers, ostrich	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flaxseed	0.5	9.1	8.8	18.4	−10.1	4.5	33.7	28.0
Matches in boxes	−10.7	3.6	7.1	0.0	−12.3	5.8	46.0	39.6
Mercury	−4.0	3.5	0.8	0.3	−1.0	−22.8	36.5	12.7
Quebracho	−26.0	2.3	0.0	−23.7	−2.1	0.0	0.0	−2.1
Soap, Castille	−4.8	0.9	0.0	−3.9	−1.5	0.0	0.0	−1.5
Sugar, Cuban, 95°	−1.1	55.7	33.0	87.6	−49.1	58.8	82.3	92.0
Sugar, Cuban, 96°	0.5	55.5	31.0	87.0	−52.1	60.1	45.0	53.0
Sugar, Cuban, 97°	14.6	57.0	2.7	74.3	−58.8	58.9	123.7	123.7
Sugar, Cuban, 100°	0.0	53.3	17.1	70.4	7.0	40.5	47.9	95.3
Toilet water	−12.4	0.0	0.0	−12.4	−7.6	0.0	0.0	−7.6
Tracing cloth	−17.2	0.1	0.3	−16.8	−3.6	−0.3	1.4	−2.5
Vanilla beans	4.6	0.0	−1.8	2.8	10.7	10.7	30.0	51.3
Walnuts, shelled	−7.4	3.2	9.4	5.2	−8.3	−9.7	50.5	32.5

Note: The changes in rates attributed to legislative dates are computed as the difference between the date referenced in the column and the rate prevailing in the previous year. The exception is the year 1922, which uses 1920 as the basis for the change to account for the cumulative effect of the Emergency Tariff Act of 1921 and the Fordney-McCumber Act of 1922. Totals are sums of changes.

price-level movements. The legislative changes include the Underwood Act of 1914, the Emergency Tariff Act of 1921, the Fordney-McCumber Act of 1922, and the Hawley-Smoot Act of 1930. The intervening periods include World War I inflation from 1915 to 1920, modest deflation from 1923 to 1929, and rapid deflation from 1931 to 1933.

Consistent with the previous discussion, the largest changes in ad valorem equivalent tariff rates are attributable to price movements. Considering only commodities subject to specific duties, the impact of Hawley-Smoot exceeds the deflationary impact of the 1930's in only a single case. In contrast, there are ten cases in which the Underwood Act reduced ad valorem equivalent tariff rates by more than did World War I inflation. However, the magnitude of the inflationary impact is much greater when it does exceed the legislative impact. For 17 of the 32 commodities, the sum of changes due to price changes is greater than the sum of changes due to legislation.

III. Other Implications

Macroeconomists typically use more aggregated tariff data than I have discussed thus far. The tariff index that is almost

universally applied in macroeconomics is computed as the ratio of the value of customs duties collected to total dutiable imports (see e.g., Dornbusch and Fischer, 1986; Grant W. Gardner and Kent P. Kimborough, 1989; Jonathan D. Ostry and Andrew K. Rose, 1989; Alok K. Bohara and William H. Kaempfer, 1991). In the discussion that follows, I refer to this index as the aggregate U.S. tariff rate. This index has widely recognized failings: (i) prohibitive tariffs receive a zero weight, leading to a downward bias; (ii) import shares change during the periods between legislative amendments, generating "spurious" movements in the index.

Figure 2 presents three alternative tariff indexes. The organization of this figure follows that for the individual commodities presented earlier. The aggregate U.S. tariff rate is presented in the first row; a variable-import-share-weighted index appears in the second row; and a constant-import-share-weighted index appears in the third row. The latter two indexes are computed from the panel data set. The left-hand panel presents the ad valorem equivalent tariff rate and the legislative component, while the right-hand panel presents the price-level component and the relative-price component.[6]

Three conclusions may be drawn from comparing these alternative indexes. First, as with the individual tariff rates, World War I inflation and deflation in the 1930's explain more of the variation in tariff levels than do legislative amendments. This can be seen by comparing the movements of the dashed lines in the left-hand panels of Figure 2 with the solid lines in the right-hand panel. The importance of price-level movements carries over to aggregative indexes because this component is common to all commodities subjected to specific duties. Second, the legislative increases that occurred in the early 1920's simply reestablished the ad valorem equivalent rates that existed before World War I. This can be seen in the relatively flat pattern of the legislative component from 1914 to 1929. Finally, changes in the composition of imports in the 1930's cause the variable-import-share index to rise less quickly than

[6]The variable-import-share index is computed from the individual commodity data as follows:

$$\tau_t^* = \sum_{j=1}^{32} s_{jt}\tau_{jt}^* = \sum_{j=1}^{32} s_{jt}\left(T_{js}^{\mathrm{L}} + T_{jt}^{\mathrm{P}} + T_{jt}^{\mathrm{RP}}\right)$$

where

$$s_{jt} = \frac{P_{jt}Q_{jt}}{\sum_{j=1}^{32} P_{jt}Q_{jt}}.$$

The constant-import-share index replaces s_{jt} with

$$s_j = \tfrac{1}{27} \sum_{t=1914}^{1940} s_{jt}.$$

The decomposition of the aggregate U.S. tariff rate employs a simply regression procedure:

$$\tau_t^* = [d_{14} + d_{21} + d_{22} + d_{30} + d_{34}] + \left[d_{15}^{20}\frac{1}{P_t} + d_{23}^{29}\frac{1}{P_t} + d_{31}^{33}\frac{1}{P_t} + d_{35}^{40}\frac{1}{P_t}\right] + \varepsilon_t$$

where, $d_{15} = 1$ in 1915 and zero otherwise, and $d_{15}^{20} = 1$ between 1915 and 1920 and zero otherwise. In this decomposition, the first term in brackets is the legislative component, and the second term in brackets is the import-price-index component.

The legislative component is the ad valorem equivalent rate prevailing in the year the legislation is passed. The interactive dummy variables on the import-price terms account for legislative shifts in the use or magnitude of specific duties relative to pure ad valorem duties. The legislative component is extended through the years between legislative amendments and subtracted from the import-price component estimated above. Thus, import-price components have a zero mean over each subinterval.

In 1930, the U.S. Tariff Commission produced a "legislative index" quite similar to the one constructed here, for all dutiable imports, but only compared two legislative dates. The commission computed tariff rates that would have prevailed in 1928 under the provisions of the Fordney-McCumber Act and the Hawley-Smoot Act and found that aggregate tariff rates would have been about 34.8 and 41.14, respectively, compared to my regression estimates of 38.1 and 44.7. Thus the average increase in either case is about 3.5 points, though the absolute levels are higher using the regression procedure.

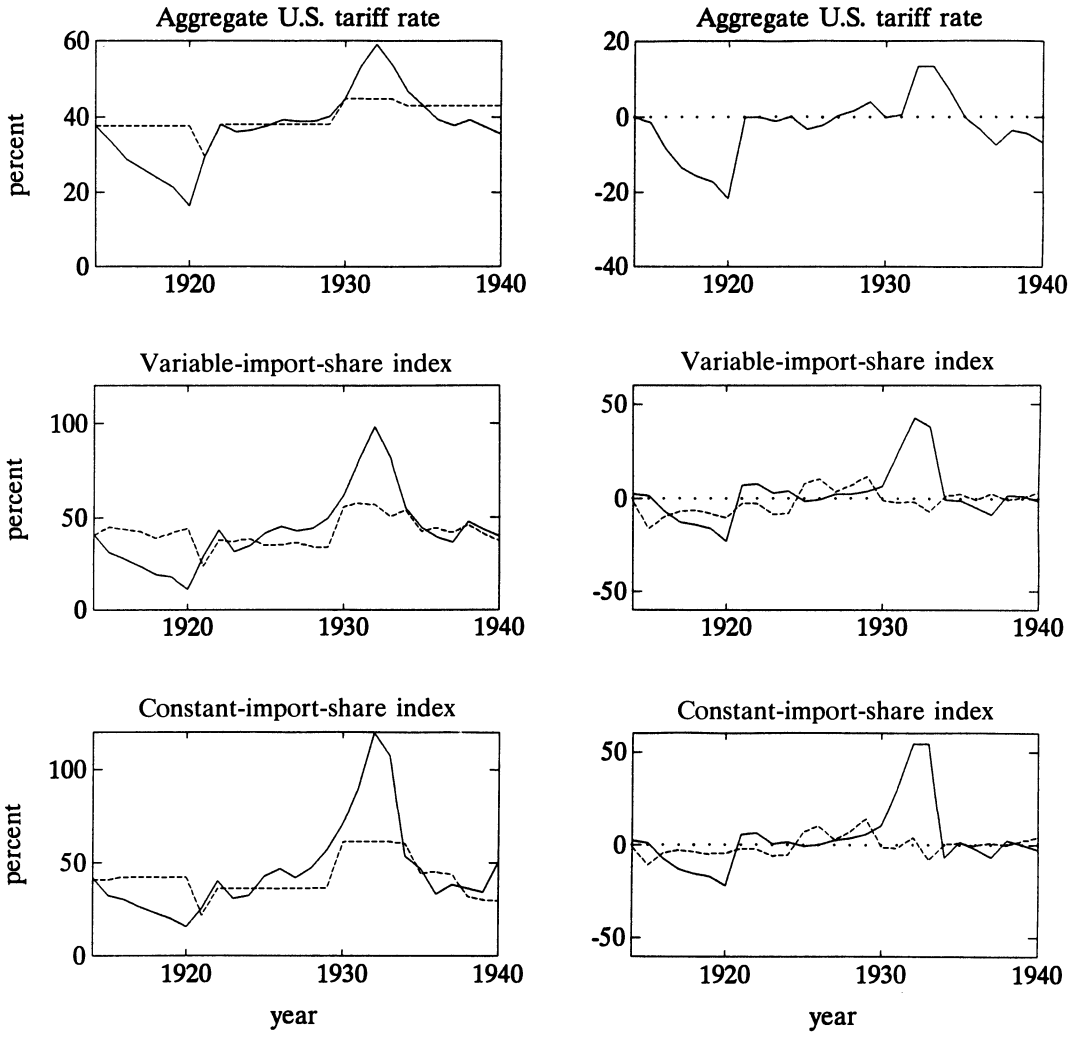

FIGURE 2. AGGREGATE-TARIFF INDEX DECOMPOSITIONS

Notes: The left-hand panels show the ad valorem equivalent tariff rate (solid line) and the legislative component (dashed line); the right-hand panels show the price-level component (solid line) and the relative-price component (dashed line). For the aggregate U.S. tariff index, no relative-price component is constructed. Construction of the import-share-weighted indexes is described in footnote 6.

the constant-share version, consistent with the view that tariff levels were reaching prohibitive levels in the 1930's. This is apparent in the second and third graphs of the left-hand panel of Figure 2. The constant-share index reaches about 120 percent in 1932, while the variable-import-share index peaks at about 100 percent. Researchers should make an allowance for the downward bias in the aggregate U.S. tariff rate, due to prohibitive duties, in attempting to quantify the impact of tariffs during the Great Depression.

Assaf Razin and Lars E. O. Svensson (1983) argue that temporary changes in tariff rates should produce current-account im-

balances, while permanent tariff changes have an ambiguous effect. The impact of temporary tariff movements on the current account warrants serious consideration in light of the substantial cyclical variation in the aggregate U.S. tariff rate.

The tariff measure appropriate for studying the political economy of commercial policy is also not clear-cut. Tax systems are notorious for containing nominal rigidities. Current examples include nominal interest payments, collection of excise taxes, and imperfect indexation of tax brackets. Treating the ad valorem equivalent tariff rate as the relevant policy variable is analogous to considering taxation of nominal interest as a deliberate inflation tax.

Eichengreen (1989 p. 15), in a rigorous analysis of the political economy of the Hawley-Smoot Tariff Act states that "the effects of price-level trends should be factored out in order to isolate the magnitude of the initial commercial initiative." Under this assumption, the legislative paths in Figure 2 are the ones relevant for studies of political economy. Judging from this figure, the only interesting commercial initiative during the period is the one studied by Eichengreen. In contrast, Stephen Magee et al. (1989) and Bohara and Kaempfer (1991) use the aggregate U.S. ad valorem equivalent tariff rate to measure the politically endogenous tariff rate. If the variation in tariff rates between dates of legislative amendment does not represent active tariff policy, then these studies dramatically overstate the variation and cyclicality of endogenous tariffs.

IV. Conclusions

The results of this paper provide dramatic evidence that the Hawley-Smoot Tariff Act of 1930 did not have the massive deflationary implications that are widely attributed to it. In fact, the results show convincingly that the opposite is true: the variations in real tariff rates caused by the Hawley-Smoot Tariff Act are quite small relative to the variations in real tariff rates caused by price deflation. This contradicts the "received wisdom" on the subject, which is revived repeatedly in discussions of the connection between Hawley-Smoot and the Great Depression.

The relationship between the nominal price level and real tariff rates suggests a new channel of international transmission of U.S. monetary policy. Deflation and the associated increases in real tariff rates should retard international trade while periods of rising price levels should boost the volume of international trade. As foreign countries also used specific duties, "tariff wars" would result from world-wide deflation, assuming foreign legislators, like their American counterparts, were slow to reduce the nominal levels of specific duties.

Research aimed at exploring the contribution of commercial policy to the severity of the world depression must recognize the strong links among money, prices, and real tariff rates during 1900–1940. Crucini and James Kahn (1994) demonstrate that a two-country multisector trade model predicts a collapse of world trade and modest declines in international output and investment, when simulated using aggregate ad valorem equivalent tariff indexes across the United States, Canada, and Europe. While preliminary, this research illustrates the importance of incorporating time-series variation in real tariff rates when attempting to quantify the economic impact of commerical policy.

Data Appendix

All data are at the annual frequency. The aggregate tariff rate from 1914 to 1940 is series U20 (ratio of customs duties to dutiable imports) from *The Historical Statistics of the United States: Colonial Times to the Present* (U.S. Bureau of the Census, 1965). The import price index from 1900 to 1940, is series U17, from the same source. The individual commodity data, consisting of quantities, values, and legislated rates of duty, were collected by the author from annual volumes of the *Foreign Trade and Navigation of the United States* (U.S. Department of Commerce, 1903–1940). The dates of legislative amendment and legislated levels of duties are reported in Table A1. The panel data set and plots of the tariff rate decompositions for all 32 commodities are available from the author upon request.

TABLE A1—LEGISLATED DUTIES

Date of legislation	1903	1909	1913	1921	1922	1929	1930	1934
Almonds	6¢	—	4¢	—	14¢	—	16½¢	—
Brazil and cream	free	—	1¢	—	—	—	4½¢/1½¢	a
Bristles	7½¢	—	7¢	—	—	—	3¢	—
Burlap	5/8 + 15%	9/16 + 15%	free	—	1¢	—	—	—
Castor beans	25¢	—	15¢	—	25¢	—	—	—
China clay	$2.50	—	$1.25	—	$2.50	—	—	b
Cigar and cheroots	$4.50 + 25%[p]	—	—	—	—	—	—	c
Cigar filler, Cuban, stemmed	50¢[p]	—	—	—	—	—	—	d
Cigar filler, unstemmed	35¢	—	—	—	—	—	—	e
Cigar filler, Cuban, unstemmed	35¢[p]	—	—	—	—	—	17½¢	f
Cigar leaf wrapper	$1.85	—	—	$2.35	$2.10	—	$2.275	g
Cigarette paper	free	60%	50%	—	60%	—	—	h
Coconuts	free	—	—	—	½¢	—	—	i
Dates	½	1¢	—	—	—	—	1¢/2¢	—
Diamonds	10%	—	20%	—	—	—	—	—
Egg yolk, dried	10%	—	—	—	18¢	—	27¢ [1931]	—
Egg yolk, other	10%	—	—	—	6¢	6½¢	7½¢	—
Feathers, for beds	15%	20%	—	—	—	—	—	—
Feathers, ostrich	15%	20%	—	—	—	—	—	—
Flaxseed	25¢	—	20¢	30¢	40¢	56¢	65¢	—
Matches in boxes	8¢	6¢	3¢	—	8¢	—	20¢	j
Mercury	7¢	—	10%	—	25¢	—	—	—
Quebracho	½¢	½¢/¾¢	free	—	15%	—	—	—
Soap, Castille	1¼¢	—	10%	—	15%	—	—	—
Sugar, Cuban, 95°	1.65¢[p]	—	1.23¢[p]	1.96¢[p]	2.16¢[p]	—	2.4625¢[p]	k
Sugar, Cuban, 96°	1.685¢[p]	—	1.265¢[p]	2.00¢[p]	2.206¢[p]	—	2.50¢[p]	l
Sugar, Cuban, 97°	1.72¢[p]	—	1.282¢[p]	2.04¢[p]	2.252¢[p]	—	2.5375¢[p]	m
Sugar, Cuban, 100°	1.36¢[p]	—	—	2.16¢[p]	2.39¢[p]	—	2.65¢[p]	n
Toilet water, perfumed	15¢	50%	30%	—	—	—	—	—
Tracing cloth	5¢ + 20%	—	30%	7¢ + 30%	5¢ + 20%	—	—	—
Vanilla beans	free	—	30¢	—	—	—	—	o
Walnuts	5¢	—	4¢	—	12¢	—	15¢	—

Notes: A superscript p indicates a preference of 20 percent. Key to letter codes in last column: a) 2¼¢/¾¢ [1936]; b) $1.75 [1939]; c) $2.25 + 12¼ percent [1934], $4.50 + 25 percent[p] [1937]; d) 25¢ [1934], 50¢–20 percent/25¢ [1936], 50¢ [1937]; e) 35¢/30¢ [1939]; f) 17½¢ [1934], 35¢ [1936]; g) $1.50 [1937]; h) 45 percent [1937]; i) ¼¢ [1939]; j) 17½¢ [1936]. Notes k–n refer to two-part duties on sugar; Volumes above a certain quota were subject to a higher duty: k) $1.846875 [1934], $0.8865 [1935–1937], $0.9 [1938–1939], $1.37775 [1940]; l) $1.875[p] [1934], 0.90 [1935–1937], $1.4 [1938], $2.0/$1.5 [1939], $0.9/$1.4 [1940]; m) $1.89936[p] [1934], $0.9135 [1935–1938], $1.5225/$2.03125 [1939], $0.9135/$1.42225 [1940]; n) $1.9875[p] [1934], 0.954 [1935–1937], $1.489 [1938], $2.125/$0.954 [1939], $0.954/$1.489 [1940]; o) 15¢ [1937].

Source: Foreign Trade and Navigation of the United States (U.S. Department of Commerce, 1903–1940).

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