REVENUE RESPONSE FROM A TAX CUT:
THE WALKER TARIFF OF 1846

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Behavioral reactions to taxes are a frequent subject of the literature on taxation. Some of that literature has concentrated on the possibility of taxpayer response so large that cuts in tax rates could result in revenue increases – i.e., the possibility of being on the wrong side of the "Laffer Curve." America's 19th century experience offers a fertile environment in which to look for such strong behavioral effects.

First of all, for the first half of the century, there was essentially one tax source: the tariff. Up until the Civil War, few other tax sources were employed to any significant degree. Consequently, within this time frame, one can concentrate on the effects of tariff rates on customs receipts without need to account for effects on other tax revenues.

Second, imports hold the promise of being very responsive to the taxes imposed upon them. Very high elasticities are required to push a tax to the wrong side of the Laffer curve. In the case of the tariff, the choice is often between identical goods: one produced domestically and one produced abroad. There may be some quality differences; but nonetheless, one is typically dealing with very close substitutes for which relative prices will play a huge role.

Third, because tariffs are often urged for protection, they do not exist solely for the purpose of revenue. As a result, what is the "wrong side" of the Laffer curve for a revenue-raising tariff is the "right side" for purposes of protection. Much of the debate over the tariff in the 19th century was over this protective intent.

The contention that America's tariff was on the wrong side of the Laffer curve was advanced repeatedly during debates over cutting tariff rates during the 19th century. Early in the century, when the need for revenue was of concern, opponents of the tariff argued that rates had already been raised so high in pursuit of protection that lowering them could be expected to increase customs receipts. In the latter part of the century – when policy makers were concerned about too much revenue coming in – the identical argument was made by partisans of protection.

Irwin (1998) investigates the possibility that the rate increases of the McKinley tariff reduced revenue after its introduction in 1890. Using macro data over the 45-year period around enactment, he estimates elasticities of import demand. He concludes that the elasticity was not high enough for a cut in tariff rates to raise revenue.

This paper looks at an earlier episode: the enactment of the Walker Tariff of 1846. The tariff reform of 1846 was a major change in 19th century tariff policy. Although remaining the principal revenue source, and serving some protectionist purposes, the reformed tariff embodied the goals of low-tariff partisans of the time. It not only reduced the overall effective tax rate from the previous tariff by 20 percent, but converted all duties to *ad valorem* rates. It remained in effect with little change until the protection-oriented Republican Party gained ascendancy in 1861. Although not the largest change in rates during the period, the 1846 transition provides the cleanest one-time break in tariff practice in the first half of the century.

BACKGROUND

From the end of the War of 1812 through the midpoint of the Jackson Administration, protectionist sentiments gained ground, and tariff rates tended to increase. But the nullification crisis of 1832 led to the Compromise Tariff of the following year under which rates were scheduled to decline over ten years. Upon the sunset of the compromise, however, high-tariff Whigs controlled both the Congress and Executive, so that the tariff enacted in 1842 marked a return to protectionism. It was this 1842 tariff that the Polk Administration overturned in 1846.

Like tariffs before it, the 1842 tariff was a mix of *ad valorem* and specific duties. In addition, several items otherwise facing an *ad valorem* assessment were subject to "minimums" for which a specific duty was applied if the price of the item was below a certain level. Effective tax rates under the 1842 tariff ranged from zero (there were a number of items on the "free list") to well over 100 percent.[1]

For items subject to specific duties, the effective rate fluctuated. The effective tax rate overall in 1845 was 29 percent. On dutiable goods, it was 34 percent.

"An act reducing the duty on imports and for other purposes" was enacted July 30, 1846. It became effective December 1, 1846. It embodied a philosophical approach that was characterized as a tariff for raising revenue in which protection was incident. The Secretary of the Treasury's message to Congress in December 1845 enumerated six principles that should underlie a tariff reform. Three of them were explicitly based on the Laffer curve theoretical construct. Specifically, Secretary Walker argued that no duty should be imposed that lay on the wrong side of the curve, that the revenue-maximizing rate should be imposed on luxuries, and that all other items should, depending on other circumstances, be taxed at lower than their revenue-maximizing rates. Moreover, in making his case for lowered duties, he asserted that lowering rates, on average, would increase revenue collections.

The new tariff regime made all duties *ad valorem*. All imports were categorized into nine separate schedules. Tariff rates ranged from 0 to 100 percent. The majority of rates were decreased, so the effective rate overall in 1848 was 24 percent; on dutiable goods, it was 27 percent.[2] Nonetheless, rates on some goods remained the same, while on a few they were actually increased. Moreover, the existence of specific duties under the old tariff meant the reform did not lower all rates uniformly.

It is this differential effect of rate changes on import categories that provides the identification needed to construct a counterfactual of how much revenue would have risen in the absence of tax reform, and to answer the question of whether the new tariff increased or decreased receipts. The presence of import categories that experienced no tariff change makes possible a difference-in-difference approach to estimating the effect. Essentially, the change in the value of imports that were taxed at the same rate before and after the reform represent the counterfactual increase in imports – how much imports would have increased had the tariff remained unchanged. The difference between the change in the value of those categories and the change in those with rate changes yields the effect of the reform.

DATA AND METHODOLOGICAL CAVEATS

Many Treasurer reports of the period provide detailed information on the value of imports by item. Such a list exists for fiscal year 1845 (Secretary of the Treasury, 1845), identifying 580 categories of imported items and the duties accrued on them under the 1842 tariff. Data published in 1853 provide a similar detailed list of import values for fiscal years 1848-53 (Secretary of the Treasury, 1853).

The organizational scheme of these two lists is not identical. Nonetheless, it is possible to exactly match many of the categories. In addition, a number of other categories can be combined (either within the 1845 taxonomy or that of 1853) to generate further matches. All told, 367 of the original categories from 1845 can be identifiably and usefully matched into those of 1848-53 for a total of 266 common categories. These matched categories account for about 85 percent of all imports and 90 percent of all duties in 1845, slightly less for the later years.

Using these matched data, it is possible to identify those imports that experienced a change in duty rates in the transition from the 1842 to the 1846 tariff. Of the 266 identifiable common categories, the tax rate was increased on 73, stayed the same for 61,[3] and was reduced on the remaining 132 categories. In value terms, the tax rate increased on about 13 percent of imports and stayed the same on 37 percent. For half, it fell.[4]

Ideally, one wants two periods to compare that are close enough together to minimize the differences in economy-wide characteristics, but far enough apart to ensure full adjustment to the new rates. Neither fiscal year 1846 nor 1847 is usable, because the act was passed in the former and became effective in the latter. Thus, 1845 and 1848 are the years used for most comparisons cited in the paper. Ideally, one would want to use more than just one year on each side of the reform. This is possible post-reform, because import data are available for 1848-53; no import data, however, for 1844 could be found.[5] Hence, calculations are made between 1845 and the years 1848-53.

There are several data and methodological issues of concern. First, there is the problem of quality change affecting the measured parameters. Second is the issue of re-export. Third, is the dominance of a few import categories that may influence the results. Fourth – and most important for the difference-in-difference approach used – is the representativeness of the goods used for the counterfactual. Last is the matter of the exogeneity of import prices.

Quality change. Based on limited data, it appears that some imported items substantially declined

in before-tax price as a result of the switch from specific to *ad valorem* duties. Critics of the reform tended to attribute this to under-invoicing, a fraud more difficult to perpetrate in the presence of specific duties (Secretary of the Treasury, 1851). Closer inspection of the pattern of price changes in the commodities identified by these critics indicates the cause was more likely a change in the average quality of the items in question.

Specific duties lay more lightly on higher quality versions of the same categories of goods because the tax is the same regardless of price. Consequently, the switch to *ad valorem* duties would cause more lower-quality (and lower-priced) goods to be imported. This amounts to the classic index number problem: if the specific duty rates of the 1842 tariff were calculated based on the prices of 1845, they are substantially lower than if calculated on those of 1848. If true, then, the effective *ad valorem* rates calculated from the old mix of imports understate the true tax rates that would have been faced by post-reform imports had the old tariff remained in place.

Unfortunately, quantity information is largely unavailable after the reform, so it is not possible to correct for this. All one can do is acknowledge the possibility that the counterfactual import growth is somewhat understated, as well as the measures of tax reduction. These both make it more likely that we would accept the hypothesis that the tax cut raised revenue when it had not. This effect is potentially worse the more aggregated the categories.

Reimportation. Imports that were re-exported were not subject to duties (or had them refunded). U.S. ports were often stopping places on the way to and from Canada, Mexico, and the Caribbean (and in 1845, the nation of Texas). Consequently, re-exportation of goods was significant, ranging from 5 to 7 percent of total imports during the period under investigation. Their significance may have been enhanced further by the passage of the Warehousing Act of 1846,[6] which expanded a system of bonded warehouses and provided that duties would not be paid until goods were removed from them (or not imposed at all if re-exported).[7]

The item-by-item data for 1845 include numbers on re-export, confirming that, for some categories, re-export can distort the data. Based on the 1845 data, 27 otherwise matched categories were dropped from the data set (and therefore not part of the 266), because re-exportation significantly affected computations of effective tax rates. How-ever, itemized re-export data are not available for the post-reform years, making it impossible to remove them and forcing the comparisons to be made on imports gross of re-export.

Dominance of certain import categories. Despite the large number of import categories, the overall total value of imports and customs receipts is dominated by a few goods. About half of all customs revenue comes from ten categories.[8] And 20 items constituted more than 70 percent of the value of imports both before and after the reform.

Two of the categories in the counterfactual, coffee and silk, play a big role in the growth of imports between the years in question. Of particular note is coffee. While not the biggest item with an unchanged effective tariff rate, it is nonetheless about 5 percent of imports. Moreover, examination of the time series of coffee imports indicates that they were unusually depressed in 1845 (Secretary of the Treasury, 1856). None of the other large categories for which data are available exhibit such an anomaly. Consequently, the statistics are computed with and without coffee included.

Representativeness of imports in the counterfactual. For the difference-in-difference strategy to work, the import categories that did not experience a decrease in tariff rates must have had economic characteristics fundamentally similar to those that did. Typically, even difference-in-difference analyses use control variables in the regression. The paucity of data from the period – especially data that have not been derived in part from the subject data – prevents this.

Whether the political process generating the new tariff rates was grounded in special interest lobbying or in the spirit of methodical efficiency-driven reform, the result should have been one in which those goods subjected to the highest tariff rates differed systematically from those subjected to low rates. Yet, this by itself is not a problem. Whether motivated by revenue maximization or protection, it is the price elasticity that would be expected to be critical to sorting import items into different categories. If the purpose is to raise revenue, the higher duties will tend to be applied to those items least price-sensitive. If the purpose is protection, the higher duties will tend to be applied to those most price-sensitive.

In contrast, the need for the counterfactual springs from the fact that total imports would have risen even in the absence of a rate reform, due primarily to the country's robust economic growth.

The principal characteristic of most concern for generating a proper counterfactual, therefore, is how imports rise with income, which is to say their income elasticity. If those goods that received no cut in rates had about the same income elasticity as those that did, the difference-in-difference method still works, even if they had, on average, very different price elasticities

The Administration's stated intent to set tariff rates to minimize the burden of the tax on "the poor, and especially those who live by the wages of labor," (Secretary of the Treasury, 1845) meant that the new rate structure was designed to charge the revenue-maximizing rate on luxuries so that lower rates might be applied to necessities. Consequently, the level of the new tariff rates could be expected to correlate with the income elasticity of the item taxed. But, while the income elasticities affect the desired *level* of duty rates, good-by-good, that does not mean they are systematically aligned with the size and direction of the *change* in the rates from one tariff regime to the next. That depends on the level of rates before the reform, as well as after.

Casual inspection of the categories reveals little in the way of systematic differences in the types of goods receiving higher or lower rates, except that on the whole the average import duty was higher for those goods receiving reductions in rates and lower for those receiving increases. This conclusion is buttressed by the data portrayed in figure 1. The six-year period of 1848-53 shows considerable change in total imports in the face of steady tax rates, and thus provides a crude test of whether the proposed counterfactual is too un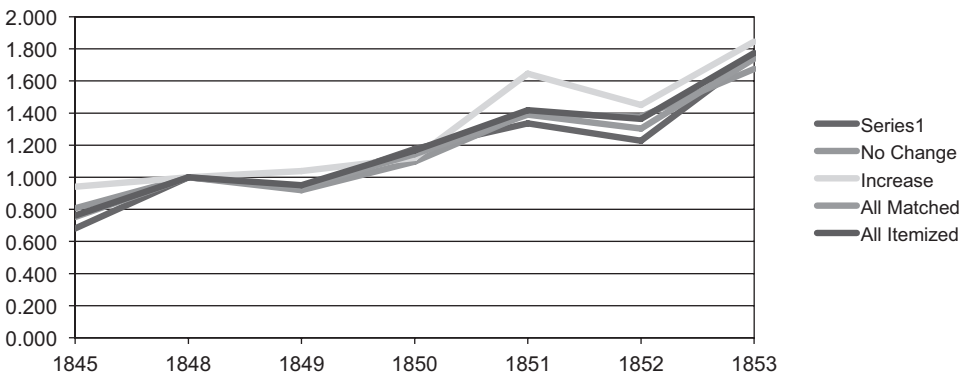like the variable it is supposed to represent. During this admittedly brief period, the behavior of imports for which duties did not change is roughly the same as that of total imports (as opposed to those imports subject to rate increases and, to a lesser extent, those subject to decreases). Moreover, what differences there are among the growth rates of imports subject to unchanged tax rates appear to be unsystematic. On the whole, one has reason to expect that a counterfactual based on the growth in imports, experiencing little or no change in tariff rates, is analytically legitimate.

Exogeneity of import prices. Constructing a counterfactual from the growth of imports on which tax rates did not increase assumes that there is no supply response to the tariff change, i.e., that import prices are exogenous. One approach to dealing with this is to estimate a fully specified model of imports. While there are some macro data available from the period, their quality and relative scarcity would make estimates from the model less reliable than using the unsophisticated approach of assuming exogeneity – a reasonable assumption given the size of the U.S. economy in the 1840s.

RESULTS

After just a year of operation, the Secretary of the Treasury felt justified in claiming that the reform had raised revenues (Secretary of the Treasury, 1847). From 1845 to 1848 total imports grew 31 percent ($113 million to $139 million). Customs revenues grew 15 percent (from $27.5 million to $31.8 million). Of course, imports should have been expected to grow in any case, which is why one needs a counterfactual to evaluate the Secretary's claim.

Figure 1: **Goupings Compared**

As a first approximation of how much imports would have increased in the absence of the tariff reform, the rate of growth is calculated for the value of all imports experiencing no change in effective tariff rates. This counterfactual growth rate can be compared to the growth in total duties. If duties grew more than the growth in the counterfactual, their behavior would provide support for the proposition that the tariff reform raised revenue. It is shown in the "rate unchanged" row of table 1.

Three measures of the growth in tariff receipts are available for comparison. First, there is the growth in receipts from the total of matched categories of imports. Second is the growth in the total of all items in the itemized list, including those that could not be matched. These first two will differ to the extent that the matched list fails to be a good sample of the total. The third is the growth in actual tariff revenues collected as measured in the budget. It differs, first, because the first two are based on accruals rather than actual receipts. Second, the reported budget receipts are collections net of collections costs.[9]

By most measures in most years, the counterfactual growth given by those imports that experienced no tax rate change is greater than the growth of total receipts. Only with respect to actual rather than accrued receipts are there instances in which the counterfactual grows more slowly or is fairly close. More telling is the performance of the imports that experienced cuts in rates. Duties from those items grew substantially more slowly than the counterfactual. Indeed, they fell in absolute terms in the first two years. And it is clear from the table that the growth of total receipts was fueled to a significant degree by the growth in imports that experienced rate increases. Thus, at first glance, the data suggest that the new tariff probably failed to bring in as much revenue as would have occurred otherwise.

The data are sufficient to support a more systematic estimate of the counterfactual. They are subjected to a weighted univariate regression based on the equation:

$$(1) \quad \%\Delta \text{ Value of Imports} = \text{Constant}$$
$$+ \beta * \%\Delta \text{ Price from Tax Reform}$$
$$+ \text{Error Term}$$

The constant is a measure of how much imports would have grown in the absence of a tax change; it must be less than the growth in revenues to be on the wrong side of the Laffer curve. β is the price elasticity of import demand times one plus the general rate of increase in before-tax prices.[10] The error term captures the effects of idiosyncratic changes in markets for individual categories of goods, both in terms of quantity changes unrelated to relative prices, and relative price changes unrelated to the tax reform.

Table 1
Change in Imports and Duties from 1845

		Change from 1845 to:					
		1848	*1849*	*1850*	*1851*	*1852*	*1853*
Rate Decrease	Imports	47%	37%	72%	96%	80%	159%
	Duties	-4%	-9%	16%	29%	20%	73%
Rate Increase	Imports	6%	10%	19%	75%	54%	96%
	Duties	78%	90%	108%	215%	175%	252%
Rate Unchanged	*Imports*	*24%*	*14%*	*36%*	*73%*	*71%*	*108%*
Above, dutiable only	Imports	26%	14%	39%	91%	67%	113%
	Duties	24%	13%	36%	86%	64%	106%
Above, no coffee	Imports	22%	7%	26%	66%	57%	99%
	Imports	33%	25%	52%	85%	73%	131%
Total from Itemized List	Duties	7%	2%	26%	53%	39%	91%
	Imports	31%	25%	53%	86%	79%	133%
Total From Budget	Duties	8%	5%	29%	58%	48%	98%
	Duties	16%	4%	38%	70%	64%	106%

If quantity measures of imports were available to compose the dependent variable, β would be equal to the price elasticity. But the use of values on the left hand side of the equation means that nominal values are being related to changes in relative prices. Depending on the measure of duties and imports used and the year chosen for comparison, the critical value that β must exceed to be on the wrong side of the Laffer curve lies between 4.9 and 5.7 (in the absence of inflation).

The weights for the regression are the values of imports in 1845. The rationale for the weighting is not an expectation that the elasticity varies with the significance of the import categories. Rather, smaller-value categories are capable of exhibiting wide swings in percent changes measures, and their influence needs to be reduced relative to those categories that cannot vary in value so easily.

The results for the regression align well with the crude approximation given by the rates of change of those imports that experienced no tariff rate change (see table 2). For 1848, the constant of .26 is only slightly more than the .24 from the crude approximation. For 1849, the constant term of .14 is the same. Subsequent years are less well aligned, but in the same ballpark. In addition to the constant being above the threshold for the counterfactual, the regression estimates of β are also substantially below the values needed to be on the wrong side of the Laffer curve, even allowing for possible defla-

tion. Exclusion of coffee from the sample raises some of β in the later years. Even in the final two years, the confidence interval does not stretch to include values needed for the Laffer curve effect.

A reason for estimating a separate regression for each year, 1848-1853, is because β potentially varies across years due to the possibility of different rates of inflation. Adjusting β for inflation is problematic, given the data available. The sub-indices for imports in the wholesale prices constructed for Philadelphia (Bezanson et al., 1936) and New Orleans (Cole, 1938) do not align well with that of Charleston (Cole, 1938). None of the three line up very well with an index of consumer prices in the UK (Office for National Statistics, 2004), the principal source of U.S. imports.

None of these measures indicate a movement of as much as 20 percent (and that is up rather than down). Consequently, plausible rates of import inflation cannot explain the variation of the range of the estimates of β across the six years. Nonetheless, one cannot conclude the estimates for the different years are statistically different from each other. And more important, they do not imply an elasticity capable of generating an increase in receipts from the cut in the average tax rate.

As a variant of the preceding test, the prices for each year were adjusted by the Warren-Pearson index[11] (Pearson and Warren, 1935) and all the years' data run in a single fixed-effects estimation

Table 2
Regression Estimates of Parameters

	measured from the change from 1845 to:					
	1848	*1849*	*1850*	*1851*	*1852*	*1853*
	Entire sample					
Constant	.26 (.02)	.14 (.03)	.45 (.03)	.87 (.05)	.69 (.05)	1.20 (.07)
β	-2.49 (.21)	-2.09 (.33)	-1.44 (.45)	-1.36 (.66)	-2.36 (.62)	-2.73 (.96)
R-squared	0.74	0.34	0.52	0.61	0.57	0.61
	With Coffee Excluded from the Sample					
Constant	.25 (.02)	.08 (.03)	.39 (.04)	.83 (.06)	.58 (.05)	1.15 (.08)
β	-2.55 (.22)	-2.47 (.33)	-1.86 (44)	-1.61 (.67)	-3.12 (.60)	-3.08 (.98)
R-squared	0.73	0.33	0.48	0.58	0.54	0.58

Table 3
Regression Estimates of Parameters

	Single Regression, All years			
Year Dummies	Entire Sample		Coffee Excluded	
1848	0.28	(.04)	0.26	(.04)
1849	0.15	(.04)	0.09	(.04)
1850	0.43	(.04)	0.36	(.04)
1851	0.84	(.04)	0.79	(.04)
1852	0.70	(.04)	0.61	(.04)
1853	1.22	(.04)	1.17	(.04)
β	2.02	(.23)	2.39	(.24)
R-squared	0.59		0.57	

model. In this estimation, each of the year dummies corresponds to the constants in the year-by-year equations. The results (see table 3) are consistent with the years estimated separately. The adjustment for prices makes virtually no difference.

CONCLUSION

Although there was a strong behavioral response to the tariff reform of 1846, it does not look like we were on the wrong side of the Laffer curve. Revenues in 1848 were 8 to 15 percent higher than in 1845. But based on the growth in imports from those items that experienced no rate change, they probably would have been about 24 percent higher under the 1842 tariff, had it been left in place. Years subsequent to 1848 show similar results. More important, revenues from all those imports that experienced a rate decrease actually fell in 1848 and 1849, and rose much more slowly than the counterfactual in the years after that. For those items on which rates were raised, receipts increased substantially. An estimate of the price elasticity of imports based on the same data place it generally short of the level it needs to be for a cut in tax rates to yield greater revenue.

Notes

[1] These are tax-exclusive rates rather than tax-inclusive rates.

[2] These measures are based on the matched sample described below.

[3] For the purposes of this paper, an unchanged rate is defined as one that has gone up or down by no more than 1 percent.

[4] The value ratios are for 1845, the corresponding ratios for 1848 are 11 percent, 34 percent, and 55 percent.

[5] Data for 1843 would be useless because it is only for half the year, owing to the switch from calendar year to fiscal year budgeting that occurred that year. The year 1842 was when the old tariff was enacted.

[6] Formally "An act to establish a Warehousing System and to amend an Act entitled 'An Act to provide Revenue from Imports and to change and modify existing Laws imposing Duties on Imports and for other Purposes'", August 6, 1846.

[7] Under the 1842 tariff, imports could remain warehoused for only 60 days before duties had to be paid.

[8] They were: 1) printed, stained, or colored cotton; 2) brown sugar; 3) silk manufactures and piece goods; 4) wool cloths and cassimeres; 5) iron bar manufactured by rolling; 6) iron and steel manufactures not otherwise specified; 7) bleached and unbleached linens; 8) spirits distilled from brandy; 9) molasses; 10) china, porcelain, earthen, and stone wares.

[9] Prior to 1850, customs receipts were reported in the budget as they were received into the Treasury – minus the expenses incurred by local collectors. Beginning in 1850, as a result of the Act of March 3, 1849, the gross amount was reported and the expenses of collection reported as a budget outlay. For purposes of this paper, the post-1850 data were reconstructed to be on the same net basis as the pre-1850 data.

[10] More correctly, it is one plus the before-tax import inflation rate multiplied by one plus the rate of before-tax import inflation relative to general inflation. If before-tax import prices rise at the same rate as domestic prices on average, then the term collapses to simple description in the text above.

[11] After making a crude adjustment for the direct effect of the tariff change on prices.

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