

## Tariff Incidence in America's Gilded Age

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### Abstract

In the late nineteenth century, the United States imposed high tariffs to protect domestic manufacturers from foreign competition. This paper examines the magnitude of protection given to import-competing producers and the costs imposed on export-oriented producers by focusing on changes in the domestic prices of traded goods relative to non-traded goods. Because the tariff increased the prices of non-traded goods, the degree of protection was much less than indicated by nominal rates of protection; the results here suggest that the 30 percent average tariff on imports yielded just a 12 percent implicit subsidy to import-competing producers while effectively taxing exporters at a rate of 14 percent. The paper also finds that tariff policy redistributed large amounts of income (about 9 percent of GDP) across groups, although the impact on consumers was roughly neutral because they devoted a sizeable share of their expenditures to exportable goods. These findings may explain why import-competing producers pressed for even greater protection in the face of already high tariffs and why consumers (as voters) did not strongly oppose the policy.

## Tariff Incidence in America's Gilded Age

### 1. Introduction

Through most of the nineteenth century, particularly after the Civil War, the United States imposed high import duties to protect domestic manufacturers from foreign competition. This protectionist policy was one of the most controversial issues in national politics during the Gilded Age of the 1880s. The two main political parties spoke for different interests in taking sharply conflicting views on the tariff issue. Drawing their support mainly from the industrial North and Midwest, Republicans supported protection, arguing that high tariffs expanded industrial employment and kept wages high. Drawing their support mainly from the more agricultural South and parts of the Midwest, Democrats advocated moderate tariffs, claiming that high duties constituted excessive taxation that hurt farmers and consumers to the benefit of big business.<sup>1</sup>

Despite the fact that import tariffs were among the most important government policies of the period, little research has been devoted to the overall economic consequences of late nineteenth century trade protection.<sup>2</sup> Many questions about the economic impact of high tariffs remain unanswered, perhaps the most important being that of tariff incidence: how much did import-competing producers benefit from protectionist policies and who paid the price? Standard indicators of trade policy fall short of addressing this issue. Nominal rates of

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<sup>1</sup> Reitano (1994) provides a recent historical overview of tariff politics during this period.

<sup>2</sup> De Long (1998) provides a general discussion of trade policy during this period. Several industry studies examine the role of protection in promoting the iron and steel industry, such as Head (1994) on steel rails, Irwin (2000a) on pig iron, and Irwin (2000b) on the tin plate, but few papers focus on the economy-wide impact of the policy.

protection reveal nothing about the distributive effects of the tariff because its incidence can be shifted onto other sectors of the economy. And effective rates of protection do not necessarily indicate the magnitude (or even the direction) of the underlying incentive to shift resources into import-competing industries.

This paper explores the incidence of U.S. tariff policy in the late nineteenth century by focusing on how the policy changed the domestic prices of traded goods relative to non-traded goods. A tariff increases the domestic price of importable goods relative to exportable goods, but this positive effect for import-competing industries can be mitigated by a tariff-induced increase in the price of non-tradeable goods. Because of this effect, according to the results reported below, the average 30 percent import tariff yielded just a 12 percent implicit subsidy to domestic import-competing producers and amounted to a 14 percent tax on exports. The tariff also redistributed a large share of national income (about 9 percent of GDP) among various affected groups, but the impact on consumers was roughly neutral because of the large share of exported products (particularly food) in consumer expenditures.

These findings help resolve several puzzles about late nineteenth century U.S. trade policy. First, the results explain why domestic manufacturers pressed for ever higher duties, even though nominal tariff rates were already very high. The reason could be that the effective subsidy to them was much smaller than suggested by nominal rates of protection. Second, the results confirm that tariffs were a highly charged political issue for good reason: they redistributed large amounts of income between various groups. In particular, the burden of high tariffs fell on producers of agricultural exports, which helps account for the opposition of farmers and others to the existing levels of taxation. Third, the fact that the protectionist policy

was roughly neutral in terms of its impact on consumers helps explain why many voters were not strongly opposed to the policy.

Section 2 of the paper sets out the economic framework that underlies the concept of “net” protection as contrasted with the more familiar concepts of nominal and effective rates of protection. Section 3 examines the empirical relationship between the prices of traded and non-traded goods to determine the degree of protection (positive or negative) given to different sectors of the economy. The results also reveal the income transfers between various groups (consumers, exporters, import-competing producers, etc.) for the mid-1880s. Section 4 applies this framework to the antebellum period for purposes of comparison with the results from the late nineteenth century and with other studies on the period such as Harley (1992). Section 5 concludes by discussing how these findings improve our understanding of U.S. trade policy during this period.

## **2. Assessing the Degree of Trade Protection**

The degree to which an import-competing sector of the economy is protected from foreign competition is a deceptively complex question. The first step in addressing this question is to examine nominal rates of protection. In the late nineteenth century, import tariffs were the sole form of U.S. trade intervention (subsidies and quotas were not employed until later in the twentieth century). These import tariffs are the nominal rate of protection as set by Congress.

Table 1 shows the average import tariff with respect to the major import-competing sectors of the economy for 1885. Because the United States was a net exporter of agricultural goods and a net importer of manufactured goods, tariffs were imposed mainly on imported

manufactured goods and consumption items. The average tariff on dutiable imports was about 40 to 45 percent and, because most tariff rates were very stable over this period, this is true of the entire period from 1870 to 1913. The distinction between dutiable and non-dutiable imports is important because about one-third of U.S. imports during this time entered the country duty-free, largely because they were products that did not compete with domestic producers, such as coffee and tea, raw silk and certain hides, India rubber, and tropical fruits such as bananas. The average tariff on total imports (dutiable and duty-free) was about 30 percent through the 1880s (U.S. Bureau of the Census 1975, series U211-212).

Nominal rates of protection do not necessarily indicate the actual degree of protection given to domestic producers. One problem with nominal rates is that they ignore the structure of protection across industries. The effective rate of protection, defined as the percentage change in value added in an activity as a result of the tariff structure, takes into account the impact of tariffs on intermediate and final goods in determining the degree to which producers of final goods are protected (Corden 1971). Low tariffs on intermediate goods combined with high tariffs on final goods can result in very high effective rates of protection for final goods.

This tendency is evident in the late nineteenth century U.S. tariff code. As Table 1 indicates, tariffs on unprocessed raw materials (such as flax and wool) were set lower than duties on final manufactured goods. For example, the duty on unmanufactured wool was about 33 percent, while the duty on manufactured wool products was about 67 percent. According to Hawke's (1975) calculations, the effective rate of protection given to domestic wool manufacturers was 229 percent in 1889. Indeed, his study confirms that, for most U.S. industries during this period, the escalation of the tariff with the level of processing led to much higher

effective rates of protection than indicated by the nominal rate of protection. However, a critical shortcoming of the effective rate of protection is that it does not necessarily reflect the magnitude (or even the direction) of the underlying incentive to shift resources into import-competing industries.<sup>3</sup>

A third measure of protection takes the price of non-traded goods as a numeraire against which the degree of assistance given to import-competing producers, and the burden placed upon export-oriented producers, is determined. The “net” or “true” rate of protection is defined as the proportionate change in the domestic price of importables relative to non-traded goods.<sup>4</sup> Taking McDougall’s (1966) and Dornbusch’s (1974) work on tariffs and non-traded goods as a point of departure, this approach focuses on how a tariff leads to excess demand for non-traded goods, resulting in an increase in their price and an appreciation of the real exchange rate (a decline in the relative price of traded to non-traded goods) as part of the international adjustment mechanism.

To illustrate the concept, consider a small open economy that produces exportables, importables, and non-traded goods. The prices of the traded goods are determined on the world market (the terms of trade), but the prices of the non-traded goods depend on domestic supply and demand. (Thus, there are three relative prices, the terms of trade and the prices of exportables and importables in terms of the non-tradeables.) The imposition of an import tariff

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<sup>3</sup> This is a general conclusion from numerous studies of the issue in the late 1960s and early 1970s. For a more recent discussion, see Anderson (1998).

<sup>4</sup> Corden (1971, pp. 106ff) calls this measure “net” protection while Clement and Sjaastad (1984) call it “true” protection. See Greenaway and Milner (1993) for a fuller discussion of the concept, which is often examined in the context of developing countries but has yet to be applied to the United States.

raises the domestic price of importables relative to exportables and, initially, relative to non-traded goods as well. This higher price shifts resources into the production of importables and out of the production of exportables and non-tradeables. It also shifts demand away from importables toward exportables and non-traded goods. The increased demand for and reduced supply of non-traded goods increases the price of non-traded goods in terms of exported goods and mitigates the increase in price of importables relative to non-traded goods.

These price changes are a necessary part of the international adjustment mechanism. An increase in the tariff reduces imports, leading to an incipient balance of trade surplus and excess demand for non-tradeables. An appreciation of the real exchange rate (that is, an increase in the relative price of non-traded to traded goods) is required to restore balanced trade and eliminate the excess demand. Because of the higher price of non-tradeables, the magnitude of protection given to domestic producers of import-competing goods is less than that indicated by the nominal tariff rate. In addition, producers of exportables face a decline in their price relative to that of non-tradeables.

In this framework, the net or true rate of protection is defined as the proportionate change in the domestic price of importables relative to non-tradeables. The tariff increases the domestic price of importables by  $(1+t)$ , where  $t$  is the ad valorem tariff rate, which in turn increases the domestic price of non-tradeables by  $(1+d)$ , where  $d$  is the percentage increase in the price of non-traded goods. As a result, the net protection to the importables sector is  $t^* = \Delta(P_M/P_N) =$

$(1+t)/(1+d) - 1$  or

$$(1) \quad t^* = (t - d)/(1 + d).$$

Similarly, the net subsidy to the exportables sector is

$$(1') \quad s^* = (s - d)/(1 + d),$$

where  $s$  is the rate of export subsidy granted by the government. If  $s = 0$ , as in the late nineteenth century, then  $s^*$  reduces to  $-d/(1+d)$ , which will be negative (i.e., an export tax).

For example, suppose that a 50 percent import tariff leads to a 20 percent increase in the price of non-traded goods. This means that the net subsidy to import-competing producers as a result of the tariff (as measured by the increase in the price of importables relative to non-traded goods) is 25 percent, while the net tax imposed on exporters (as measured by the decline in the price of exportables relative to non-tradeables) is 17 percent. Note that if the price of non-traded goods rises by the full amount of the tariff, then the import-competing sector receives no protection since its relative price did not increase.

As is often the case in tax policy, policy makers can choose the nominal rate of protection, but cannot directly control the incidence of the tariff because they cannot influence how much it drives up the price of non-traded goods. In terms of incidence, in the example just considered, only 60 percent of the nominal protection actually reaches import-competing producers as a subsidy, while 40 percent of the nominal protection falls on exporters as an effective export tax. Only if the tariff has no impact on non-traded goods prices will the nominal rate of protection translate into assistance of the same magnitude for import-competing producers.

Furthermore, the following equilibrium relationship can be shown to hold:

$$(2) \quad \hat{P}_N = \omega \hat{P}_M + (1 - \omega) \hat{P}_X,$$

where  $P_N$  is the price of non-traded goods,  $P_M$  is the price of importables,  $P_X$  is the price of exportables,  $\hat{\phantom{x}}$  indicates the proportion rate of change (e.g.,  $\Delta P_X/P_X$ ). The incidence or shift

parameter  $\omega$  is a function of the compensated demand and supply price elasticities for non-tradeables with respect to the three prices.<sup>5</sup> This incidence or shift parameter  $\omega$  summarizes the general equilibrium relationship between the prices of traded and non-traded goods and indicates the degree to which importables and non-tradeables are substitutes in production and consumption. In general,  $\omega$  falls between zero and one and indicates the fraction of the increase in the price of importables (with a tariff) that spills over and increases the price of non-tradeables. When  $\omega$  is zero, there is no change in the price of non-tradeables as a result of the tariff and hence the price of import-competing goods rises by the amount of nominal protection. As  $\omega$  approaches one, in which case  $\Delta P_N/P_N$  will be close to  $\Delta P_M/P_M$ , implying that import-competing and non-traded goods are close substitutes in production and consumption, there will be little net protection of importables relative to non-tradeables.

If import tariffs are the only form of trade intervention, such that there are no export subsidies and therefore  $\Delta P_X/P_X = 0$ , then from equation (2) we have:

$$(2') \quad d = \omega t.$$

Combining equations (1) and (2') yields

$$(3) \quad t^* = (t - \omega t)/(1 + \omega t).$$

In this equation, the net or true rate of protection hinges on the nominal rate of tariff protection ( $t$ ) and the incidence parameter ( $\omega$ ). Since  $1 \geq \omega \geq 0$ , the nominal rate of protection overstates the true degree of protection ( $t \geq t^* \geq 0$ ). If  $\omega = 0$ , then  $t^* = t$ , but as  $\omega$  approaches one, then  $t^*$

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<sup>5</sup> Specifically,  $\omega = (h_M^D - h_M^S)/(h_N^S - h_N^D)$ , where  $h_i^D$  and  $h_i^S$  are the compensated demand and supply price elasticities for non-traded goods with respect to the price of import-competing goods and non-traded goods, in compliance with homogeneity restrictions. See Greenaway and Milner (1993, pp. 120-121) for further details.

approaches zero.

The incidence parameter  $\omega$  also indicates the proportion of the tariff that is borne on exporters as an export tax. Assuming again that there are no export subsidies, then combining equations (1') and (2') yields

$$(3') \quad s^* = -\omega t / (1 + \omega t).$$

If  $\omega = 0$ , then the price of exportables in terms of non-tradeables does not change and exporters do not suffer. But if  $\omega = 1$ , then the price of exportables relative to non-tradeables falls by the full extent of the tariff and a nominal tariff of a given amount acts as an export tax of the same amount. Thus, if the tariff has a large impact on the price of non-traded goods, the tariff simultaneously yields a low level of protection for import-competing producers while imposing a great cost on exporters.

Figure 1 illustrates these relationships. The horizontal axis measures the relative price of exportables in terms of non-tradeables ( $P_X/P_N$ ) and the vertical axis measures the relative price of importables in terms of non-tradeables ( $P_M/P_N$ ). In the absence of any trade policy interventions, the domestic price of importables in terms of exportables ( $P_M/P_X$ ) is given by the world market and is represented by the ray extending from the origin. The schedule HH indicates different combinations of prices of importables and exportables (relative to non-tradeables) that clear the market for non-tradeable goods. (If the price of importables goes up, then the price of exportables must go down to eliminate the excess demand for non-tradeables.) The initial equilibrium is at A where the terms-of-trade ray intersects the HH schedule.

The imposition of an ad valorem import tariff of rate  $t$  increases the domestic price of importables relative to exportables, rotating the ray upward by the amount of the nominal tariff.

The new equilibrium point is B, where this ray intersects the HH schedule. To remove the incipient tariff-induced trade surplus and accompanying excess demand for non-tradables, the price of non-traded goods increases by  $d$  percent. The price of exportables relative to non-tradeables falls by  $1/(1+d)$  while the price of importables relative to non-tradeables increases by  $(1+t)/(1+d)$ .

The magnitude of the increase in price of non-tradeables is determined by the degree of substitutability between non-tradeables and importables in production and consumption. If there is substitutability between nontraded and traded goods, then HH is negatively sloped.<sup>6</sup> Figure 1 depicts two extreme cases. If importables and non-tradeables are perfect substitutes in production and consumption ( $\omega = 1$ ), then the HH schedule is horizontal, the price of non-tradeables increases by the full extent of the tariff, and the final equilibrium is at C. In this case, the import-competing sector receives no protection, because its relative price did not increase, and the burden of the tariff falls entirely on producers of exportables, whose price falls relative to non-tradeables by  $1/(1+t)$ . This nominal tariff is a pure export tax with no protection for import-competing producers relative to non-tradeables.

Alternatively, if exportables and non-tradeables are close substitutes ( $\omega = 0$ ), then the HH schedule is vertical, the price of non-tradeables does not change, and the final equilibrium is at D. In this case, the nominal tariff equals the net or true protection given to import-competing producers. The price of exportables falls relative to importables, but not relative to non-traded goods.

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<sup>6</sup> This figure illustrates the particular case when there is substitutability in production and consumption for traded and non-traded goods, but no such substitution between exportables and importables.

This framework is a useful way of thinking about the late nineteenth century American economy for several reasons. First, the U.S. economy at this time can be viewed as being comprised of three sectors, producing agricultural goods (exportables), manufactured goods (importables), and non-traded goods (services). These sectors were roughly balanced in terms of size: in 1879, agriculture and mining accounted for 33 percent of GDP, manufacturing about 23 percent of GDP, and services roughly 44 percent of GDP (Gallman 1960, Gallman and Weiss 1969). Any analysis that goes beyond a simple two-sector tradeoff between the export and import-competing sectors and brings into account another large segment of the economy (the non-traded services sector) is therefore historically relevant to the U.S. economy at this time.

In addition, the impact of protection in raising the price of non-traded goods and inflating the cost structure of the economy is not only commonly recognized today, but was frequently mentioned in the late nineteenth century. The imposition of high trade barriers to protect a large segment of the economy could not help but to have an impact on the non-traded sector of the economy as well. Many observers recognized that increased production in import-competing industries as a result of the tariff would create demands on resources that would increase production costs and thereby mitigate the gains to domestic producers of import-competing goods while adversely affecting exporters. The Special Commissioner for Revenue, David Wells (1867, p. 37), wrote in his first report that a high import tariff “will soon distribute itself throughout the whole community, and will eventually manifest itself and reappear in the shape of an increased price for all other forms of labor and commodities; thus aggravating the very evil which in the outset it was intended to remedy.” And William Grosvenor (1871, p. 359) noted: “A duty on one article may not affect at all the cost of producing others. But duties on three

thousand articles, each duty being diffused in its effect through a whole community, must have some power to increase the cost of producing every thing, and thus must not only tend to neutralize every benefit contemplated, but to put even our natural industries at a disadvantage.”<sup>7</sup>

Finally, changes in the real exchange rate were an important part of the international adjustment mechanism in the late nineteenth century. In response to a higher tariff, an alternative adjustment would be a nominal exchange rate appreciation, which would also lower the relative price of tradeables. In the late nineteenth century, however, the United States was on a metallic monetary (gold) standard for much of the period and so nominal exchange rate changes were ruled out. Instead, changes in the domestic price level, i.e., the price of non-tradeables, were required to remove the excess demand for non-traded goods and to restore the trade balance to its previous level.<sup>8</sup>

### 3. Measuring Net Protection and Tariff Incidence, circa 1885

Like the concepts of nominal and effective protection, the net or true rate of protection can be explored with some simple calculations. Because the incidence parameter  $\omega$  is determined by a complex structure of substitution relationships, a common strategy is to estimate it indirectly by rearranging equation (2) as follows:

$$(4) \quad \hat{P}_N - \hat{P}_X = \omega(\hat{P}_M - \hat{P}_X),$$

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<sup>7</sup> Contemporary economists such as Taussig (1906) described the mechanisms by which high tariffs kept the level of U.S. wages and prices higher than they would otherwise be.

<sup>8</sup> For a recent study on commercial policy, the real exchange rate, and non-traded goods that uses an approach similar to the one in this paper, see Devereux and Connolly (1996).

and estimating

$$(5) \quad \log (P_N/P_X)_t = \alpha + \omega \log (P_M/P_X)_t + \epsilon_t,$$

where  $\omega$  is the elasticity of  $P_N/P_X$  with respect to  $P_M/P_X$  and  $\epsilon$  is an error term. This regression relies on the fact that the terms of trade are determined by the world market while the prices of non-traded goods are endogenous.

This method of estimating  $\omega$  has the advantage of only requiring time series data on export and import prices and the price of non-tradeables. Lipsey (1963) calculates export and import prices starting in 1879, as presented in U.S. Bureau of the Census (1975), series U-226 and U-238. A series representing the price of non-traded goods is not readily available, in part because data on the prices of such goods (which typically include housing and other services) are scarce and have not been collected to create a separate price index. Researchers have typically used a broad price index, such as the GDP deflator or the consumer price index, as largely representative of non-traded goods prices in lieu of data on purely domestic goods prices. In this case, the GDP deflator is taken from Johnston and Williamson (2005) and the consumer price index from David and Sollar (1977).

One concern about this specification is that the results from a regression based on equation (5) may be spurious if the relative price series are nonstationary. Table 2 reports augmented Dickey-Fuller test statistics on the data. These statistics confirm that one cannot reject the hypothesis that  $\log (P_M/P_X)$  and  $\log (P_N/P_X)$  using either the GDP deflator or CPI have a unit root in levels (i.e., are nonstationary), while one can reject that hypothesis in first difference (indicating that the series are stationary when differenced). Estimation of equation (5) in levels might be appropriate if the non-stationary series are cointegrated, i.e., that there is a long-run

equilibrium relationship between the two such that a linear combination of them is stationary; otherwise, it should be estimated in first differences to ensure that the regressors are stationary.

Table 3 presents regression results for equation (5) for the period 1879 to 1913. The results for the levels regressions suggest that  $\log(P_N/P_X)$  and  $\log(P_M/P_X)$  are not cointegrated. Using the Engle-Granger (1987) approach, the augmented Dickey-Fuller test on the residuals of the levels regression indicates that the residuals are nonstationary and hence the levels results are not consistent and may be spurious. (The Durbin-Watson test statistic also suggests that the residuals are not stationary.)

However, in the first difference regression, both the regressors and the residuals are stationary. Both measures of non-traded goods prices produce similar point estimates of  $\omega$ , 0.47 in the case of the GDP deflator and 0.57 in the case of the consumer price index. With a rough estimate of  $\omega$  as 0.52 along with an average tariff on total imports of 30 percent, equation (2') indicates that these duties would push up the price of non-tradeables by 16 percent. Is it plausible that import tariffs could have such a large impact on the prices of non-traded goods? Most accounts of this period put the level of U.S. prices as substantially higher than in free trade Britain. Ward and Devereux (2003, p. 832) report that the prices of services (housing, domestic service, and transportation) were roughly 25 percent higher in the United States than in Britain during the late nineteenth century, despite the similar income levels in the two countries. In 1910, the nominal dollar-sterling exchange rate was £4.86, but Williamson (1995) calculates the purchasing power parity exchange rate was 30 percent higher at £6.35, reflecting trade impediments and higher U.S. non-traded goods prices.

From equations (3) and (3'), the estimate of  $\omega$  also implies that the net protection given

to import-competing producers (manufacturing) was 12 percent and the effective tax on exporters (agriculture) was 14 percent. As expected, import tariffs were not nearly as protective as indicated by nominal or effective rates of protection and the burden imposed on the exportables sector was substantial. These results are consistent with several well-known features of the nineteenth century debate over tariff policy, in particular, the continual press by manufacturers for ever higher levels of nominal protection and the general opposition of farmers and Southern planters to the high level of the tariff.

These results indicate that the nominal protection of 30 percent as indicated by the average tariff translates into just a 12 percent degree of net or true protection to import-competing manufacturers. Just as agricultural subsidies in the twentieth century get capitalized into land values and the prices of other inputs, thereby raising farmers' costs, the import tariffs of the late nineteenth century put upward pressure on producers' costs by increasing nominal wages and the prices of non-traded goods. Thus the advantages effectively gained by the import-competing producers, as compared to non-traded goods producers, was much lower than might be deduced from the nominal rates of protection. As a result, import-competing interests had an incentive to press for even higher tariffs to gain greater protection. This may account for the push by manufacturing interests for even higher rates of nominal protection in the McKinley tariff of 1890.

The results also indicate that exporters faced a substantial export tax, roughly the magnitude of 14 percent. The term  $\omega$  indicates the fraction of protection that is borne by exporters, meaning that about half of whatever nominal import tariffs were imposed resulted in a higher price of non-traded goods with no compensating change in the price of exportable goods.

Although the Constitution formally prohibited export taxes, agriculture faced a large, implicit export tax as a result of the import tariffs of the day. Agricultural exports were quite diverse in the late nineteenth century, encompassing traditional staples such as cotton and tobacco produced in the South, as well as grains and meat products produced in many states across the Mid-West. Therefore the implicit export tax hit a broad constituency.

The framework developed above can also reveal the income transfers associated with this incidence of protection (Clement and Sjaastad 1984, Choi and Cumming 1986).<sup>9</sup> Table 4 presents data on the structure of the economy that is required to calculate the income transfers between various groups. Exportable production is the fraction of GDP accounted for by agriculture and mining, while importables production is manufacturing as a share of GDP. In order to get a central figure around 1885, these figures are a simple average of the shares in 1879 and 1889, taken from Gallman (1960) and Gallman and Weiss (1969).

Table 5 presents an intersectoral transfer matrix that records the implied income transfers among five groups – import-competing producers, exporters, consumers, taxpayers, and the government – as a result of the tariff policy that put average duties at 30 percent. The redistribution of income is calculated under the assumption of that the policy does not change total income.<sup>10</sup> According to these results, trade protection was responsible for reshuffling about

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<sup>9</sup> Although a fully specified, multi-sector computable general equilibrium model might yield more precise accounting of changes in income distribution, previous research has found that this framework yields findings similar to those more complex simulations without the detailed data requirements. See Choi and Cumming (1986).

<sup>10</sup> The net welfare impact (or the static deadweight loss) from trade protection would probably be very small, perhaps just a percentage point of GDP. Late nineteenth century U.S. protection did not create many grossly inefficient import-competing industries because U.S. producers were technological innovators and free trade within the large domestic market ensured

9 percent of GDP between various agents in the economy. The implicit export tax that accompanied the policy of import protection imposed a cost on exporters – measured as  $\omega t^* q_X / (1 - \omega)$  – amounting to 3.8 percent of GDP. Meanwhile, the tariff forced consumers to pay 3.6 percent of GDP in terms of higher prices on importables, 3.0 percent of GDP going to import-competing producers ( $t^* q_M$ ) and 0.6 percent of GDP going to the government ( $t^* m$ ) in customs duties. Turning to the beneficiaries, import-competing industries gained 3.0 percent of GDP from consumers, while consumers gained the equivalent of 2.9 percent of GDP at the expense of exporters by virtue of the lower prices of exportables. The government collected a total of 1.6 percent of GDP in customs revenue, which – by assumption – was returned directly to taxpayers.

The most interesting question that the transfer matrix can address is whether consumers benefitted or lost from protection. Consumers gain from the lower domestic price of exportables (by the amount  $\omega t^* c_X / (1 - \omega)$ ) but lose from the higher domestic price of importables (by the amount  $t^* c_M$ ). This gives rise to the “neoclassical ambiguity” of the standard specific factors trade model (analyzed by Ruffin and Jones 1977) wherein the change in the real wage as a result of the tariff hinges on the weights of goods in the consumption bundle. In this case, the condition for consumers to gain from protection is  $\omega > c_M / (c_M + c_X)$ , i.e., when the incidence parameter is greater than the share of importables in the consumption of tradeables. Thus, consumers stand a chance of gaining from tariffs when domestic consumption of exportables is

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vigorous competition among them. Using an applied general equilibrium model of the antebellum U.S. economy, Harley (1992) calculates that the aggregate welfare loss associated with the tariff in 1859 was less than one percent of GDP. Like the results presented here, this small net loss masked significant amounts of redistribution.

large.

The results here indicate that consumers lost only slightly as a result of protection. As the table indicates, consumers gained 2.9 percent of GDP at the expense of exporters but paid 3.0 percent of GDP to import-competing producers and the government. The reason import duties did not put a heavy burden on consumers is that about 40 percent of consumption expenditures were devoted to food, and food accounted for more than half of U.S. exports in the mid-1880s. (After cotton, breadstuffs and meat were the largest categories of U.S. exports.) Although these products were important exports, most domestic production was consumed at home; for example, about three quarters of the wheat crop was for domestic consumption. About 20 percent of consumer expenditures went to clothing, the major importable in the consumption bundle, and another 10 percent was devoted to tobacco manufactures and alcohol, both of which were imported.<sup>11</sup> Thus, consumer spending was somewhat skewed toward expenditures on exportables rather than importables.<sup>12</sup>

These results suggest that, as a broad class, consumers as voters would have been roughly split by or largely indifferent to the tariff issue. In fact, in the 1888 presidential election fought largely over the tariff issue, the electorate was closely divided. The tariff reform candidate, the incumbent Democratic president, Grover Cleveland, received 48.6 percent of the vote, while his

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<sup>11</sup> Various consumer expenditure surveys of the 1870s and 1880s indicate budget shares of about 42 percent for food, 10 percent for tobacco and alcohol, 18 percent for housing, 20 percent for clothing, and 10 percent for other items (Ward and Devereux 2003, p. 833).

<sup>12</sup> Of course, either a different trade pattern or a different consumption pattern would have produced a different result in terms of the impact on consumers. Consumers in Britain, like those in the United States, devoted a large share of their expenditures to food, but consumers had a strong interest in free trade because the country was a net food importer during the nineteenth century.

pro-tariff Republican rival, Benjamin Harrison, received 47.8 percent of the vote. However, given the geographic distribution of these votes, Harrison won the electoral college by 233 to 168 and thus became president.<sup>13</sup> The extremely close popular vote could be interpreted as indicating that the electorate was equally divided on the tariff question, consistent with the distributional effects here on consumers.

If consumers' gains and losses from protection were roughly matched, this implies that consumers-cum-taxpayers gained from protection. Consumers cum taxpayers gain whenever the shift parameter exceeds the share of production of importables in the total production of tradeables, i.e.,  $\omega > q_M/(q_M + q_X)$ . This conclusion assumes that all the revenues from import duties were returned to consumers as a rebate or in exchange for lower domestic taxes that financed public goods. If the import duties were redistributed by government to specific groups, such as Civil War veterans, then the conclusion that consumers-cum-taxpayers gained from protection might not hold.

As a check on these results, we can use other data to assess the validity of the magnitude of the transfers reported here. The most transparent transfer is from the government to taxpayers. In the mid-1880s, the government collected about \$200 million in tariff revenue, about 1.7 percent of GDP at that time, taking nominal GDP as about \$12 billion (U.S. Bureau of the Census 1975, series U-210). This is remarkably close to the 1.6 percent of GDP indicated in these calculations.

One aspect of these calculations that might alter the magnitude of the implied transfers is the production of exportables and importables as a share of GDP. If not all agricultural and

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<sup>13</sup> See Rietano (1994) for a detailed study of the 1888 political debate over tariff policy.

mining production was linked (by prices) to export markets, and not all manufacturing production influenced by import competition, then these shares could exaggerate the size of the tradeable goods sector of the U.S. economy and inflate the magnitude of the transfers.

#### **4. An Antebellum Comparison**

Although this paper has focused on the impact of the tariff in the late nineteenth century United States, a topic that has been relatively neglected by economic historians, this framework can also be used to shed some light on the antebellum period. Given the sharp political conflicts between the North and the South over tariff policy, the connections between the tariff and income distribution prior to the Civil War has long been of interest to economic historians. Pope (1972), James (1986), and Harley (1992) all employed computable general equilibrium models of varying degrees of sophistication to examine the impact of the tariff prior to the Civil War (specifically, in 1859, in the case of James and Harley).

The framework of net protection provides a much simpler, but also much less detailed, approach to the questions.<sup>14</sup> Two key differences promise to make the results dissimilar from the late nineteenth century. First, the incidence parameter  $\omega$  is expected to be higher in the antebellum period. As  $\omega$  also represents the degree of substitutability between traded and non-traded goods, a value closer to one than to zero implies somewhat more substitutability between importables and non-tradeables than between exportables and non-tradeables. In the antebellum period, exports consisted largely of cotton and tobacco produced on Southern plantations, and

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<sup>14</sup> An advantage of the net protection framework used in this paper is that the data requirements and modeling assumptions are much less severe than in computable general equilibrium models, although the results are much less detailed.

the concentration of exports in traditional goods (i.e., raw material or natural resource intensive primary products) are typically less substitutable with non-tradeables than are importables and non-tradeables.<sup>15</sup> Second, the structure of the economy was different prior to the Civil War. Although exports and imports as a percent of GDP were comparable, production of exportables (agriculture) was a larger and production of importables (manufactures) was a smaller part of the economy.

The results for the antebellum period will be presented with greater brevity than those above. North (1966) calculated export and import prices for the period, and once again the GDP deflator is taken from Johnston and Williamson (2005) and the consumer price index from David and Sollar (1977). Like the findings in the previous section, the three variables –  $\log(P_M/P_X)$  and  $\log(P_N/P_X)$  using either the GDP deflator or the CPI – are nonstationary in levels but are stationary in first differences for the period 1815 to 1860. (These results are not reported but are available upon request.) Like the post bellum period, the levels regressions suggest that  $\log(P_N/P_X)$  and  $\log(P_M/P_X)$  are not cointegrated and hence those regression results are not consistent.

In a first difference regression, both the regressors and the residuals are stationary. In the first difference regression, the point estimates of  $\omega$  are 0.84 (with a standard error of 0.06) using the GDP deflator and 0.96 (with a standard error of 0.04) using the consumer price index. Taking a rough estimate of  $\omega$  as 0.90 along with an average tariff on all imports of 20 percent in late 1850s, equation (2') indicates that this tariff would push up the price of non-tradeables by 18

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<sup>15</sup> Most studies find much higher estimates of  $\omega$  for countries where traditional exports dominate. In the late nineteenth century, the U.S. export bundle was a mix of traditional and non-traditional exports, and hence  $\omega$  should be lower.

percent. This implies that the net protection given to import-competing producers (manufacturing) was just 2 percent and the effective tax on exporters (agriculture) was 15 percent. The higher estimate of  $\omega$  implies a large impact on the price of non-traded goods and confirms what Southerners complained fiercely about the time, that a burden of the tariff was almost entirely shifted onto Southern exporters through higher prices of importables and non-traded goods.

Table 6 presents the structure of the economy in 1850 and Table 7 presents the implied transfers.<sup>16</sup> Three differences stand out in comparison to the late nineteenth century period. First, the magnitude of the total transfers was less in the antebellum period, perhaps because the average tariff (after the early 1830s) was lower than in the Gilded Age. Second, despite that, transfers from exporters were greater in the antebellum period than later. The greater resources squeezed from exporters combined with a greater commodity and geographic concentration of those exporters in the South made the tariff even more controversial in the antebellum period. Third, unlike the later period, consumers in the antebellum period appear to gain from the tariff because domestic consumption of exportables (agriculture) was greater while consumption of importables (manufactures) was lower as a percent of GDP.<sup>17</sup> These results may be somewhat misleading in that the major exportables were cotton and tobacco, and at least the former was not

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<sup>16</sup> Due to the availability of greater data, previous work, such as Pope, James, and Harley, cited above, also focused on the late antebellum period even though the most contentious period in terms of the debate over the tariff was in the 1820s and early 1830s.

<sup>17</sup> The most transparent transfer for which other data can be used to assess the validity of the transfer magnitudes is that from the government to taxpayers. Around 1850, the government collected about \$40 to \$50 million in tariff revenue, about 1.5 percent of GDP at that time, taking nominal GDP as about \$2.4 billion (U.S. Bureau of the Census 1975, series U-210). This is reasonably close to the 1.0 percent of GDP indicated in these calculations.

directly purchased by consumer households but by textile firms in the North.

The Table 7 results can be compared with those in Harley's (1992) general equilibrium calculations (in his Tables 4 and 7). While the categories are not exactly comparable, the similarity in the results is mixed. Harley finds a much smaller positive impact of the tariff on the price of non-traded goods, only about three to six percent, as opposed to the 18 percent here. He also estimates that labor as a whole loses a small amount (about 0.5 percent) from the tariff whereas a slight gain to consumers is estimated here. (This difference may be due to the different assumptions about the consumption bundle.) However, Harley's estimate of the tariff's burden on farmers and planters is closer to that found here; he estimates a loss of about two to three percent of GDP on farmers and planters (exporters) while the results here indicate it is about five percent. His gains to capital (an import-competing factor) are only about 0.4 percent of GDP whereas here they amount to about 0.1 percent of GDP.

## **5. Conclusions**

This paper has examined the issue of tariff incidence in the late nineteenth century United States. Several findings give us insight into some of the important features of American trade politics in the late nineteenth century. First, although the nominal level of protection was very high to judge by legislated tariff rates, the net protection given to import-competing manufacturers was diminished by the tariff-induced increase in the price of non-traded goods. The calculations presented here suggest that the 30 percent average tariff on total imports resulted in net protection of just 12 percent for import-competing producers (manufacturers) and an export tax of 14 percent on export-oriented producers (agriculture). This low level of net

protection gave these manufacturers an ongoing incentive to press for higher duties to increase their level of support.

Second, the tariff redistributed substantial amounts of income among various producer groups and consumers. In addition, the burden of the tariff on exporters exceeded the benefits received by import-competing producers. The sizeable redistribution brought about by the protectionist trade policy justified its status as one of the most highly controversial issues in national political during this period. Both the desirability and the efficiency of the transfers were leading political issues.

Third, the policy of tariff protection appears to have been roughly neutral with respect to consumers. This outcome is due to the large weight of exportable goods (principally food) in domestic consumer expenditures. The political implication is that tariff opponents would not be able to generate much support for their position by appealing to consumer interests, and in fact the pro-tariff Republicans dominated national politics for many decades after the Civil War.

Fourth, in the antebellum period, the incidence of the tariff was higher on the exportables sector. Although the total transfers as a result of the tariff were lower than in the late nineteenth century, the cost to the exportables sector was greater than in the post bellum period. Because the production of export crops was highly concentrated in the South, states such as South Carolina vehemently argued that the tariff was a sectional policy, making trade policy even more politically divisive than in the late nineteenth century.

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**Table 1: Average Tariffs on Imported Goods in 1885**

Category	Average Import Tariff (percentage)
Breadstuffs	16
Chemicals, drugs, dyes, etc.	32
Cotton manufactures	40
Earthen, stone, and chinaware	56
Fruit, nuts, etc.	28
Flax, hemp, jute, unmanufactured	16
Flax, hemp, jute manufactures	34
Glass manufactures	59
Iron and steel manufactures	35
Leather manufactures	28
Silk manufactures	50
Distilled spirits, liquors, wine	77
Sugar, confectionery, molasses	70
Tobacco manufactures	81
Wool, unmanufactured	33
Wool manufactures	67
All other dutiable articles	25
Total, Dutiable Merchandise	46
Total, All Imported Merchandise	31

Source: Statistical Abstract of the United States (1901), pp. 239-248.

**Table 2: Augmented Dickey-Fuller Test Statistics**

	Levels	First Difference
$\log(P_{GDP}/P_X)$	-1.47	-6.04*
$\log(P_{CPI}/P_X)$	-1.64	-4.79*
$\log(P_M/P_X)$	-2.67	-4.97*

\* indicates significance at the 1 percent level.

**Table 3: Estimates of the Incidence Parameter**

	$\log(P_{GDP}/P_X)$		$\log(P_{CPI}/P_X)$	
	Levels	First Differences	Levels	First Differences
$\log(P_M/P_X)$	0.69* (0.01)	0.54* (0.12)	0.95* (0.16)	0.57* (0.11)
Adj. R <sup>2</sup>	0.37	0.25	0.47	0.33
DW	0.35	1.88	0.05	2.02
ADF test statistic on residuals	-2.13	-6.14*	-3.07	-5.85*

Note: Time period: 1879 - 1913. Constant term not reported. \* indicates significance at the 1 percent level. See text for data sources. Test statistics from Phillips and Ouliaris (1990).

**Table 4: U.S. Economic Structure, c. 1885 (percent of GDP)**

Exportable Production ( $q_X$ )	28
Importable Production ( $q_M$ )	25
Non-tradeable Production	47
Exports ( $x$ )	7
Imports ( $m$ )	5
Consumption of Exportables ( $c_X = q_X - x$ )	21
Consumption of Importables ( $c_M = q_M + m$ )	30

Source: Exportables includes agriculture and mining, importables includes manufacturing, and non-tradeables includes construction and services. The sectoral shares as a percent of GDP are an average of 1879 and 1889 in Gallman (1960), Table A-1, and Gallman and Weiss (1969), Table A-1. Exports and imports from U.S. Bureau of the Census (1975), series U 191, 194.

**Table 5: Intersectoral Transfers c. 1885 (as a percent of GDP)**

From \ To	Import-Competing Industries	Consumers	Taxpayers	Government	Total
Exporters	0.0	2.9	0.0	1.0	3.8
Consumers	3.0	–	0.0	0.6	3.6
Government	0.0	0.0	1.6	--	1.6
Total	3.0	2.9	1.6	1.6	9.1

Note: Based on Table 3,  $\omega = 0.53$ , and  $t = 0.30$ , which yields  $t^* = 0.12$  and  $s^* = -0.14$ . Figures may not sum to totals due to rounding.

**Table 6: U.S. Economic Structure in 1850 (percent of GDP)**

Exportable Production ( $q_X$ )	36
Importable Production ( $q_M$ )	19
Non-tradeable Production	45
Exports ( $x$ )	6
Imports ( $m$ )	7
Consumption of Exportables ( $c_X = q_X - x$ )	30
Consumption of Importables ( $c_M = q_M + m$ )	26

Source: Exportables includes agriculture, importables includes manufacturing, and non-tradeables includes mining, construction, and services. The sectoral shares as a percent of GDP are in Gallman (1960), Table A-1, and Gallman and Weiss (1969), Table A-1. Exports and imports from U.S. Bureau of the Census (1975), series U 191, 194.

**Table 7: Intersectoral Transfers in 1850 (as a percent of GDP)**

From \ To	Import-Competing Industries	Consumers	Taxpayers	Government	Total
Exporters	0.0	4.6	0.0	0.9	5.5
Consumers	0.3	–	0.0	0.1	0.4
Government	0.0	0.0	1.0	--	1.0
Total	0.3	4.6	1.0	1.0	7.0

Note: Based on Table 6, and  $\omega = 0.90$ ,  $t = 0.20$ , which yields  $t^* = 0.02$  and  $s^* = -0.15$ . Figures may not sum to totals due to rounding.

Figure 1: Import Tariffs and Relative Prices

