The 1807–1809 Embargo Against Great Britain

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The lack of success of the 1807–1809 Embargo by the United States has generally been attributed, first, to a lack of effective enforcement, and, second, to an inability to inflict greater economic damage on Great Britain than was suffered by the United States. This paper challenges both explanations. It is argued, first, that the Embargo did effectively reduce both countries to autarky. It is argued, second, that in autarky the relative price in Britain of agricultural products that had previously been imported rose by more than the relative price in the United States of manufactured goods that had previously been imported.

FROM Pericles's Megaran Decree in 432 B.C. to the Arabs' oil embargo in 1973, nations have from time to time attempted to use the economic weapon of refusing to trade with other nations in order to achieve political ends. This weapon of embargo was applied by Thomas Jefferson in December 1807 to induce Great Britain and France to abandon their policies of seizing neutral American ships.[1] It was, however, the Embargo that was abandoned in March 1809, without having achieved its goal. Many contemporary Americans believed, and many later historians have argued, that the Embargo was doomed to failure from the start because the United States did not have sufficient economic power to make the weapon effective. It has been argued that the young nation was more dependent on foreign trade than was the larger and more powerful Great Britain. The Embargo thus supposedly hurt American producers and consumers more than it hurt their British counterparts. On the other hand it has been argued also that a floodtide of smuggled goods swept around the barriers erected by the government, in accordance with the undefiable pull of supply and demand, and rendered it ineffective.

This paper offers the contrary view that the Embargo was in fact an effective weapon, and that it failed through a lack of the political will

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[1] The immediate provocation for the Embargo was Britain's Orders in Council, passed on November 11, 1807, which declared that any neutral ships that did not stop in British ports were liable to capture. Napoleon subsequently declared in the Milan Decree that any ships that *did* stop in British ports were liable to capture. But the real target of the Embargo was Great Britain, as the British blockade against Napoleon prevented the United States from trading with France anyway.

and perseverence to use it, rather than through a lack of economic power.

THEORETICAL OUTLINE

By economic power we do not mean the size of the economy; in this sense of power Great Britain clearly dominated the United States. We mean rather the absence of dependence of consumers on foreign goods and producers on foreign markets.

We can give more precise meaning to these concepts through the standard international trade model. There are two commodities, agricultural products and manufactured goods. In the state of autarky, in each country production and consumption must coincide. The relative price of agricultural products, determined by the slope where the production possibility frontier is tangent to some sort of aggregate indifference curve, is higher in Britain than America: $P_{b_1} > P_{a_1}$. This implies that in the state of free trade, America exports agricultural products to Great Britain in return for manufactured goods, at a common relative price ($P_{b_0} = P_{a_0}$) that lies between the two autarky relative prices. Trade allows each country to attain a higher level of consumption and social welfare, where the new price ratio is tangent to a higher indifference curve. A total embargo returns each country to autarky; the question is whether welfare falls more in Britain than in America.

Even if we could show that welfare does fall more in Britain, it is, of course, possible that it would not be the one to capitulate. The problem is one of "bilateral monopoly," and the solution may be that Britain, engaged in a vital struggle with Napoleon for the control of Europe, had a stronger bargaining position than the United States. But this is a political question. The most that economic analysis can tell us, even in theory, is how much welfare, or consumer and producer surplus, was lost by the United States compared to that lost by Britain.

If production were fixed, we would have only to consider the losses in consumer surplus, since the change in quantities consumed must be the same for each country, as measured by the price ratios P_{a_1} and P_{b_1}. If the relative price of agricultural products rises more in Britain than the relative price of manufactured goods rises in the United States, then the United States might be said to have greater economic power.

Production, however, is not necessarily fixed. Rather, substitution occurs along each country's production possibility frontier, with the United States in autarky producing more manufactured goods than before in response to their higher price, and fewer agricultural products, and Britain the reverse. Now we have to consider the losses in producer surplus, as measured by the changes in income. If the percentage change in the value of the American consumption bundle is less than the

change in the value of the British consumption bundle, then the United States might be said to have greater economic power.

When we try to apply this simple theoretical model to the actual situation, we see immediately that several complications may arise. First, the price ratios in each country before the Embargo were not equal. There were rather, significant transport costs and duties creating a wedge between the price lines: $P_{a_0} = P_{b_0}(1 + t_0)$. Secondly, the countries may not have been in perfect autarky during the Embargo. If a significant amount of trade went on in spite of the Embargo (i.e., smuggling), then the price ratios still would be tied to each other, but with a greater wedge in between them: $P_{a_2} = P_{b_2}(1 + t_2)$, $t_2 > t_0$. In this case the proper model of the Embargo would specify, instead of a return from the (relatively) free trade point to the production possibility frontier, a movement part way along the British offer curve, as in the case of a tariff or quota.[2] A tariff, represented by a shifting inward of the United States offer curve, would be a more appropriate analogy than a quota, represented by a vertical line at the same point, since one would expect the amount of smuggling to vary with foreign demand. To the extent that the United States government's device for reducing trade was the threat of fines or confiscations, the "tariff revenue" would be interpreted as going to the government. To the extent that the device was moral or patriotic suasion, the revenue would go as a monopoly rent to those with weaker moral or patriotic principles. To the extent that the device was the threat of imprisonment, or that smugglers were induced to go to extra expense to transport their goods, for example, through the Northern wilderness and across the Canadian border, the "revenue" was a deadweight loss.

One could attempt to take these factors into account. One could even formulate a model with transport services as a third good. Shipping earnings in 1807 were about 40 percent as large a credit item on the United States current account as all commodity exports combined, and it was the New England shipping interests, not the southern cotton and tobacco interests, that led the political opposition to the Embargo.[3] But before attempting so ambitious a model, we should first try to verify whether there was, in fact, a significant amount of smuggling activity. This question is worth a careful investigation in its own right, since it has been argued that the reason the Embargo failed is that the government was unable to enforce it effectively.

[2] For an exposition of the standard international trade model, including the effect of a tariff on the offer curve, see a text such as Richard Caves and Ronald Jones, *World Trade and Payments* (Boston, 1977).

[3] Douglass North, "The United States Balance of Payments 1790–1860," in National Bureau of Economic Research, *Trends in the American Economy in the Nineteenth Century, Studies in Income and Wealth*, Vol. 24 (Princeton, 1960), p. 595.

WAS THE EMBARGO EFFECTIVELY ENFORCED?

United States trade data are limited in this period. The trade figures that exist show a large drop in 1808, the unmistakable effect of the Embargo. Treasury statistics show that exports declined 79.30 percent (from $103,343 thousand to $22,431 thousand) and that imports declined 58.86 percent (from $138,500 thousand to $56,990 thousand), or with revisions by North, 59.86 percent (from $144,740 thousand to $58,101 thousand).[4] The natural question to ask is whether a large amount of smuggling was not reported in the American figures.[5]

Jefferson was plagued with reports of smuggling. Ships were loaded in deserted river inlets or offshore, to evade customs officials and the navy. In the South, goods were smuggled to Spanish Florida or British Bermuda, there to be transferred to ships for the voyage to England. Smuggling was reported even more often in the North, via Canada. Key routes were by boat across Lake Champlain from New York to the St. Lawrence and across Passamaquoddy Bay from Maine to New Brunswick. On the Canadian frontier, customs officials often lacked the power, and sometimes lacked the will, to enforce the law; in northern Vermont, local resistance approached the militance of armed rebellion. Jefferson was forced to compromise his belief in the freedom of individuals from government interference in order to enforce the Embargo more strictly. For example, he took measures to combat an increase in coastwise trade, such as the movement of flour from North Carolina to New England, evidently a funneling of exports into smuggling routes to Canada.

The evidence of the existence of smuggling is mostly anecdotal. As yet, no one has given statistical evidence on the extent of smuggling that took place. To answer this question we must look at British data for this period, specifically accounts of imports and exports kept in the *Journal of the House of Commons,* Vol. 64 (1809), pp. 549, 640-648. If any ships sailed from the United States to Great Britain without the knowledge of American officials, their cargoes should show up in these figures. The British officials would not have kept the arrival of such ships secret to protect them from possible punishment by the American authorities; they had to collect duties on these cargoes (at a rate recently raised by the Orders in Council). In fact, the British publicized these violations of

[4] North, ibid., pp. 590–92.

[5] A second natural question is why the official Treasury figures show any trade at all during 1808, since the year was supposedly completely covered by the Embargo. Evidently some shipping did take place with the knowledge of customs officials, especially in the early weeks of the Embargo before Jefferson and Gallatin had made the necessary provisions for its enforcement. Enforcement was also apparently more lax with imports than exports; Congress amended the Embargo Bill to allow merchants who had already purchased goods abroad to bring them into the country. This explains why imports did not decline as much as exports. It also explains why the Embargo was called an "embargo" and not a "boycott."

the Embargo as much as possible to demonstrate its futility to the American public. The British figures also are much superior to the American figures in that they are broken down by type of commodity, by quarter of the year, and sometimes by geographical destination or point of origin.

The Real Value of goods imported into Great Britain from the United States in the year ending January 5, 1809 (the year covered by the Embargo) was £1,751,986, compared to £6,531,410 in the previous year, a decline of 73.18 percent.[6] Exports were £5,302,866 compared to £12,097,942, a decline of 56.17 percent.

If smuggling occurred it could have taken two forms: Smuggling directly from the United States to Britain, and smuggling indirectly via Canada or other third countries. Direct smuggling would be included in the figures just cited, and may explain the fact that British imports from the United States declined 6.12 percentage points less than exports reported by the United States, and British exports to the United States 2.69 percentage points less than imports reported by the United States. The magnitude of direct smuggling is discussed below, after indirect smuggling.

Indirect Smuggling

Indirect smuggling via other countries should be reflected in British figures on trade with countries other than the United States. The Real Value of all goods imported into Great Britain from Europe, Africa and the Americas in the year ending January 5, 1809, was £30,190,459 compared to £38,677,810 in the preceding year. The loss of imports is greater, not less, than that attributable to the United States figures alone. This suggests little indirect smuggling. But there were too many other things happening in world trade at this time, especially factors relating to the vicissitudes of the Napoleonic Wars, to allow us to reach conclusions on these data alone. We need data that are broken down into smaller geographical divisions.

G. R. Porter gives figures for exports from Great Britain broken down geographically.[7] They show that in 1807 exports totalled £35,412,867; those to the United States were valued at £11,846,513; and those to the Americas excluding the United States were valued at £10,439,423. In 1808 exports to the United States declined to £5,241,739; exports to the Americas excluding the United States rose compensatingly to £16,591,871; and total exports were almost unchanged at £35,007,591. It is hard to know how much, if any, of the roughly £6.5 million of exports that were diverted from the United

[6] *Journal of House of Commons*, LXIV (1809) Appendix, p. 648. The Real Values appear to be a deflation of Official Values "calculated on Average Estimates of Three Years so as to preserve the Comparison of one Year with another."

[7] G. R. Porter, *The Progress of the Nation* (London, 1909), Section III, p. 102.

States to other parts of the Western Hemisphere were smuggled subsequently to the United States. Certainly at least some of this diversion of exports represented attempts of anxious British producers to find new markets in South America—many of them newly liberated from Spanish rule—and in British possessions in North America and the West Indies. Otherwise the British manufacturing sector would have suffered no ill effects at all from the Embargo, which descriptive evidence given by contemporaries and price data given below show not to have been the case. Furthermore, very few of the reports of smuggling appearing in American newspapers, speeches, and letters refer to imports of manufactures; rather they concern the smuggling out of export materials. On these grounds, despite the close correspondence in Porter's figures between the decline in exports to the United States and the rise in other exports to the Americas excluding the United States, we must return to the data on British imports if we are to reach a definitive conclusion about the extent of smuggling.

The House of Commons data are broken down into geographical divisions for only one commodity, cotton. Fortunately this one commodity in these years represented 59 percent to 65 percent of the total value of United States exports to Great Britain, so conclusions drawn on the basis of cotton should be useful.

The six geographical divisions are the United States, British Plantations (in the West Indies), Portuguese Settlements in America (Brazil), the Continent of Europe, Asia (the East Indies), and Other Parts (including Turkey and Egypt). Whatever indirect smuggling took place would most likely fall into the second category, or perhaps the last. The figures show that cotton imports from the United States fell from 44,090,079 lbs. in the year ending January 5, 1808, to 12,228,397 lbs. in the year ending January 5, 1809. Cotton imports from British plantations, far from making up some of the difference, actually declined from 18,051,138 lbs. to 15,721,294 lbs. Imports from Other Parts also fell. Imports from Portuguese Settlements in America rose from 0 to 5,120,111 lbs.; this was due, however, to defeats of Napoleon in Iberia in 1808 and the consequent opening of Brazil to Great Britain, probably not to smuggling of United States cotton. In any case, the decline in total imports into Great Britain from 74,925,306 lbs. to 43,468,145 lbs. is as large as the decline in imports from the United States. Cotton imports from all places other than the United States remained remarkably steady at about 31,000,000 lbs. in the three years ending January 5, 1807, 1808, and 1809.

It is, of course, possible that indirect smuggling occurred and that the only reason it does not show up in the figures is because of a simultaneous decline in imports from the West Indies and elsewhere due to exogenous factors related to the Napoleonic Wars. Napoleon had prohibited trade with Britain in the preceding year (the Berlin Decree).

But he was no more able to enforce this "paper blockade" in the year of the Embargo than in 1807. We can conclude fairly confidently, then, especially considering the magnitude of the decline in direct cotton shipments from the United States, that the extent of smuggling via third countries was not significant, at least in the case of cotton.

It might be suspected that even though little indirect smuggling may have occurred in cotton and other southern crops, northern export products were indirectly smuggled to a much greater extent, due to the proximity of New England and New York to Canada. Grain and ashes (for example, potash) are two of the exports mentioned most frequently by contemporaries as having been smuggled. (The former was the second largest United States export to Great Britain; the latter was much less important.) The British records show imports of corn, grain, and meal from the United States declining by £858,110 and imports from Europe, Africa, and the Americas declining by £1,547,570. It seems difficult to believe that production of corn, grain, and meal outside of the United States could have declined by much more than £7,000,000 (or by more than three quarters of its previous level), which would be necessary before one could believe that any smuggling took place through other countries. The records show imports of ashes from the United States declining by £105,982 and imports from Europe, Africa, and the Americas declining by £65,900. This suggests the possibility that roughly £40,000 of ashes were smuggled. But this amount is very small when compared to the size of the important exports like cotton and grain.

Direct Smuggling

We are left with the possibility of illegal shipments directly from the United States to Great Britain. We still have to account for the £1,751,986 worth of United States imports reported by Great Britain, including the 12,228,397 lbs. of cotton.

Some of the imports took place with the knowledge of United States officials. These must have been towards the beginning of the Embargo, before the provisions for its enforcement had been worked out.[8] The quarterly breakdown of imports reaching Britain supports this view. The official value of imports from the United States in the first quarter of 1808 (£482,028) compares favorably with the same quarter of 1806 and 1807 (£510,677 and £603,470, respectively). The same correspondence holds in quantity terms for cotton: 9,004,840 lbs. in the first quarter of 1808 compared to 6,806,244 and 9,277,484 for 1806 and 1807, respectively. It is only after the first quarter that British imports from

[8] The Embargo Act was originally passed by Congress hurriedly, without any provisions for penalties. The first moves to provide for its enforcement were made by Treasury Secretary Gallatin on December 24, 1807, but they did not take hold for a while. Louis M. Sears, *Jefferson and the Embargo* (Durham, N.C., 1966), p. 60.

the United States begin to drop off, by roughly half in the second quarter and more rapidly thereafter. By the last quarter, imports are zero or negligible in most commodities, and the total is only about one-fiftieth its normal level. Evidently the American authorities made little effort to enforce the Embargo in the first quarter, or whatever effort they made was offset by early sailings of ships anxious to clear port before enforcement became stricter, but they did make an effective effort thereafter. Perhaps the imports that are reported in the last three quarters should be interpreted as smuggled merchandise. This interpretation is especially plausible since by the end of the year almost all the remaining imports were in cotton, tobacco, and sugar, the crops of the South, where the sparse population density of the coastline made direct smuggling easier, whereas none of the imports is in corn, grain, and meal, the principal export products of the North, where the coastline geography was not so suitable. (It should also be noted that exports from Britain to the United States do not decline throughout the year, confirming the suggestion that the Embargo was not enforced as strictly against imports as against exports.)

One way to evaluate the extent of direct smuggling is to assume that it would have been accomplished by transferring goods to British ships. Jefferson received many reports of "British vessels hovering on the coast for the purpose of receiving cargoes."[9] Certainly there were also some reports of American ships sailing without clearance from local customs officials, but it appears to have been easier for American violators to rendezvous with British ships offshore or in uninhabited inlets than to make the necessary preparations in an American port for a transatlantic voyage without arousing the suspicions of local authorities.

The assumption that smuggled goods were carried in British ships can help us only if we know what proportion of imports arriving in Britain from the United States were carried in British ships. There are two pieces of evidence on this question that can be culled from the House of Commons records, but they are unfortunately conflicting.

First are figures on the number of British ships arriving in British ports from the United States. Eighty-four vessels, totalling 18,229 tons, are reported for the year ending January 5, 1808. Only 12 vessels, totalling 2,188 tons, are reported by the following year. This decline, 85.72 percent by number or 88.00 percent by tonnage, is significantly greater than the percentage decline in imports from the United States. This would seem to indicate that the proportion of imports carried on

[9] Gallatin to Jefferson, September 16, 1808, as cited ibid., p. 88. Also: "From every information I have received there appears to be a very shameful Traffic carried on about St. Marys River, it is said . . . that English ships go there, & take in on the Spanish side cargoes of Cotton, Rice &c," ibid., p. 133.

British ships actually declined, rather than rising as one might expect under the direct smuggling hypothesis.

The second piece of evidence makes use of the differential rates of duty imposed on cotton imports depending on whether they were carried by British shipping or foreign shipping. The *Journal of the House of Commons* records a duty rate of 16s 10 1/2d on British shipping versus £1 5s 5d on foreign shipping, per 100 lbs. of cotton, in the case of imports from the United States. In the case of cotton imports from British Colonies and Plantations and from the East Indies, no duties on foreign shipping are reported, implying that 100 percent of these imports were carried by British shipping. We can assume, as an extreme upper bound, that 100 percent of imports from Turkey, Brazil, Europe, and Other Places were also carried in British shipping. If we work backwards from the total amount of duty revenue reported, we conclude that, as a lower bound, 41.6 percent of cotton imports from the United States must have been carried in British ships. (The figure is higher if we allow that some imports from Europe and elsewhere were carried in non-British ships.) This percentage is far above the 15 percent of U.S. imports and exports known to have been carried in non-U.S. vessels in normal times.[10] It would thus point to a large amount of smuggling of U.S. cotton aboard British ships.

It is hard to see how two methods of approximating the proportion of U.S. exports to Britain carried by British shipping could give two such different answers. The discrepancy cannot be explained by arguing that a greater percentage of cotton than of other exports may have been carried by British shipping; even if the reported 2,188 tons of British shipping carried nothing but cotton, they still probably could not have carried the 5,087,013 lbs. or more of cotton implied by the calculation based on rates of duty. If one must choose between the two methods of calculation, it seems more likely that there is something wrong with the second one. In this case, there would not have been a great deal of direct smuggling.

But if we reject the hypothesis that there was a large amount of direct smuggling between the United States and Britain, we must account for the fact that the U.S. imports received by Great Britain are greater relative to the previous year than the exports reported by the United

[10] Figure given by North, "The United States Balance of Payments," p. 394, for the 1790–1819 period. North's calculations are based on data on net tonnage capacity of vessels entering United States ports from abroad. The proportion of this tonnage representing non-U.S. shipping is even lower during the Napolenonic Wars: 7.23 percent in 1807 (B. R. Mitchell, *Abstract of British Historical Statistics,* (London, 1962) p. 451), of which only a subfraction would be British. Total tonnage falls by 49 percent in 1808, U.S. shipping about the same as non-U.S. shipping, but this tells us little about smuggling since we have already assumed that little smuggling took place in imports to the United States. Rather, it is consistent with the 56–59 percent decline in reported imports.

States. In 1807 imports from the United States reported by Britain were 28.94 percent of total exports reported by the United States (converted at $4.80/£). In 1808 we would expect the British share of U.S. exports to have declined if anything, because of stricter enforcement of the Embargo against its chief target than against other countries. Using the 1807 ratio as an upper bound, at most $6,491,531 in exports to Britain departed the United States with the knowledge of customs officials. This converts to £1,352,402, or 77.19 percent of the Real Value of United States imports received by Great Britain. How are we to explain the remaining 22.81 percent except by smuggling?

The answer is simply the time lag in Atlantic voyages. No attempt at all was made to enforce the Embargo until the beginning of 1808.[11] If we allow one month for a merchant voyage from the United States to Britain, then we can assume that the ships arriving there in the first month of 1808 left the United States prior to the Embargo. This would account for approximately one-third of the imports normally reported by Great Britain in the first quarter. This is roughly £200,000 in terms of the Official Value of all imports, or 3,000,000 lbs. in terms of the quantity of cotton. It corresponds to 24 percent in Official Value of all imports for the entire year, or 25 percent of the quantity of cotton for the year. There is no lag carry-over at the end of the year to cancel out this amount because direct imports had dwindled almost to zero by the end of the year. Thus the extra 24 percent or 25 percent of British imports afford a near explanation for the 22.81 percent of British imports that U.S. export figures did not account for. To attempt to make the numbers correspond any more closely would exceed the limits to the accuracy that we can expect of trade statistics.

Conclusion on Smuggling

Probably some of the imports reported by Great Britain in the last three quarters of 1808 represented smuggling; no ship could take six months or a year to complete a voyage across the Atlantic. Furthermore, one could argue that the large quantity reported in the first quarter constitutes a lack of enforcement of the Embargo, and that whether it took place with or without the knowledge of American customs officials is immaterial. It is clear, however, that by the end of the year, the quantity of imports reaching Britain directly from the United States was a small fraction of the normal quantity. The figures from the section "Indirect Smuggling" indicate that few imports reached Britain via third countries, at least in cotton and grain (which made up 77 percent of all imports in 1808). Undoubtedly smuggling occurred; contemporary reports established this. But the evidence

[11] The *Boston Gazette* was still publishing rates of duty on imports, insurance rates on voyages, and news of departures and arrivals in its January 2, 1808, issue.

presented here demonstrates that the American government could and (by the end of the year) did enforce the Embargo to a much greater extent than was realized by contemporaries or by later historians.

THE RELATIVE EFFECT OF THE EMBARGO ON THE UNITED STATES AND BRITAIN

The conclusion that the extent of smuggling between the United States and Great Britain was not significant compared with the magnitude of previous trade simplifies the theoretical analysis necessary to compare the effects of the Embargo on the two countries. We can treat the Embargo as having returned the two economies to the state of autarky. But now we are faced with a practical problem: extant data on prices this early in the century are meager, and yearly data on domestic production and consumption are even more so. Even if we can find reliable price data to compare the impact on consumers in the two countries, without quantity data we will have difficulty discovering whether producers were able to adjust their production in response to the new price ratios, substituting manufactured goods for agricultural products in the United States and agricultural products for manufactured goods in Britain, and thus whether they were able to avoid a precipitous decline in income.

The Effect of the Embargo on Quantities Produced

There is historical evidence that Americans were remarkably successful in 1808 at switching into the production of manufactured goods when they were cut off from their usual source of supply. The greatest success was achieved in the Mid-Atlantic states. Philadelphia attained a new prosperity visible to visitors as merchants turned their capital, and sailors turned their labor, to the production of ironware, earthenware, glassware, lead, textiles, chemicals, and other manufactured goods. These goods were claimed to be equal in quality and, if anything, cheaper, than British imports, even though many of them had never been manufactured in the United States before. (One Philadelphia entrepreneur sent to Jefferson "a sample of I believe the first White Lead ever manufactured in the U. States.")[12]

New Englanders were less enthusiastic about giving up their ships for manufacturing, but many of the first shoe and textile factories that later dominated the region's economy date from this time. According to reports, southerners were the most enthusiastic in their willingness to make do under the Embargo. Due to the economic geography, this willingness took the form of more time spent in household handicrafts,

[12] William Dazell, February 1809, p. 16 in Sears, *Jefferson*.

rather than the rise of industry. To be sure, cotton and other crops piled up on the docks.

So successful was this beginning of the American conversion to industry that Jefferson claimed these dynamic effects as a benefit of his policies, and some of his supporters urged him to plan to retain restrictive measures against imports no matter what the outcome of European politics. This long-run infant industry argument is not relevant to our evaluation of American and British economic independence. But whatever substitution was accomplished in the space of one year is relevant, whether or not it was anticipated by Jefferson.

The historical evidence for Britain is that it was less able than the United States to attain during the Embargo a consumption bundle anywhere near that it had enjoyed with trade. This was particularly true in the case of the major import, cotton. Cotton (and, for that matter, tobacco, sugar, and other southern American crops) did not grow in England.[13] The possibility of "substitution into cotton" would not refer to greater domestic production, but rather to greater imports from British possessions and other places overseas. We have already seen the figures on imports of cotton in our discussion of smuggling. We noted then that British cotton imports from places other than the United States remained remarkably unchanged from 1806 to 1808 at 31,000,000 lbs. per year. We used this fact to argue against the smuggling of United States cotton via these other places. But we can also use it now to argue that Britain was unable to obtain any additional cotton from alternative sources.

If Britain was unable to make up its loss in imports of raw materials from non-American sources, by the assumption of balanced trade it could not have made up its loss in exports of manufactured good in non-American markets either. Of course, Britain's trade account need not have been balanced. In fact, it moved toward trade deficit in 1808: it ran a smaller trade surplus than in the previous year. Thus Britain's loss in exports was, if anything, greater than its loss in imports.

A worsened trade surplus represents a fall in national income relative to domestic expenditure. One possible explanation is the increase in British government expenditure on the war effort against Napoleon. But a fall in income in the manufacturing sector, partly as a result of the U.S. embargo, seems to fit the facts well.

An index of total production fell 4.8 percent in 1808, and an index of textile production fell a devastating 32.8 percent.[14] Textile factories

[13] The only major U.S. export that could be produced domestically in England was grain. But far from making up the loss in grain through an increase in domestic production, Britain suffered a short supply in 1808 due to a poor harvest. (Arthur Gayer, W. W. Rostow, and Anna Schwartz, *The Growth and Fluctuation of the British Economy*, 1790–1850, Vol. 1 (London, 1953), pp. 83–84.) Nor was it able to make up the difference through imports from other sources: "the Baltic grain supply had been virtually eliminated by the continental blockade since 1807." P. 503.

[14] The indices belong to Hoffman and Kondratieff, respectively, and are cited in Gayer, Rostow, and Schwartz, *The Growth and Fluctuation of the British Economy*.

were reported lying idle, deprived simultaneously of a major market (which in 1807 had absorbed 43 percent of their exports) and its major source of raw materials (which in 1807 had supplied 59 percent of their imports of raw cotton). British workers, doubly hit by unemployment and by high prices for bread, were reported in the United States to be parading their discontent in the streets. Apparently resources freed up in the exportable sector (manufacturing) could not be reabsorbed into production in either the importable sector (agriculture) or a possible nontraded goods sector (the military).

The Effect on Prices

Commodity price data are limited. Prices of traded goods in both the U.S. and British economies were frequently cited in the political debate over the Embargo by one side or the other to prove that the policy either was or was not going well. These obviously are not to be trusted; for example, two Congressmen of the two opposing parties cited numbers in the same issue of the Liverpool *Prices Current* to reach opposite conclusions about the price of American grain in England.[15] Official price statistics are to be preferred, but they are sparse. One cannot use the House of Commons data on the value of trade, even for cotton in conjunction with the quantity data, because the official prices at which these imports were valued were very different from the actual market prices.

For Great Britain, prices of cotton twist, iron bars, and a few other manufactured goods are available from standard sources. For both countries, the best indicators of agricultural prices are prices for specific varieties of cotton, as recorded in Charleston and Liverpool by agents for a cotton brokerage firm.[16] These data are especially useful because of the importance of cotton, because they refer to the identical commodity on both sides of the Atlantic, and because they are available monthly rather than yearly so that one can better isolate the effect of the Embargo. Also useful for the United States is an index of farm prices in Massachusetts recently published in this JOURNAL by Winifred Rothenberg.[17]

The weak spot in published numbers is manufactured products in the United States. We would be limited to two indices (of which one—textiles—corresponds fairly well to the cotton twist available for Britain), which are available only on a yearly basis. To augment the United States data, I obtained weekly numbers from the Prices Current section of the *Boston Gazette,* for issues from July 4, 1807 to July 3,

[15] The political debate over the effectiveness of the Embargo includes the Senate speeches of Mr. Giles (Nov. 24 and Dec. 2, 1808), Mr. Goodrich (Dec. 21, 1808), Mr. Lloyd (Nov. 21, 1808 and Sept. 30, 1807), and Mr. Pickering (Nov. 30, 1808).

[16] G. W. Daniels, "American Cotton Trade with Liverpool Under the Embargo and Non-intercourse Acts," *American Historical Review*, Vol. 21 (1918–19), p. 276.

[17] "A Price Index for Rural Massachusetts, 1750–1855," this JOURNAL, 39 (December 1979), 975–1001.

1809. Prices were recorded for five representative manufactured goods: nails, lead, glass, foreign gunpowder, and American gunpowder; and four representative agricultural products: cotton, flax, flour, and corn.

Before we give the results of averaging these price data, it may be instructive to discuss what happened to the prices over time. In 1807, the Charleston and Liverpool cotton prices reach their peak in the spring, in accordance with usual seasonal factors. In 1808 the Liverpool prices begin at the usual level, but rise continuously throughout the year, reaching in January of 1809 a peak two and a half times the normal January level; then the prices return to their normal level as the effects of the ending of the Embargo are felt. The Charleston cotton prices reach their low in January 1809, at half their normal January level, and then begin to rise again.

The Boston price of Upland cotton follows roughly the Charleston price for the same variety, but averages four cents a pound higher. The Boston prices of flour and corn fluctuate erratically. Flax is almost unchanged. The prices of lead, glass, and nails are relatively constant, but the price of foreign gunpowder jumps in the month that the Embargo was declared, continues to rise, and reaches its peak in late December 1808, at twice its usual level. The price of American gunpowder rises too, but not by as much. Most prices return to their normal levels in 1809.

Average prices before, during, and after the Embargo are given in Tables 1 and 2. The prices in the periods before and after the Embargo are combined in the subsequent calculations for a better estimate of the prices that would have prevailed without the Embargo. They are given separately in the table because one could argue that one should compare the Embargo prices only to the post-Embargo prices, since the British Orders in Council were in effect in both of these periods, but not in the pre-Embargo period.

The last column gives the ratio of the average price during the Embargo to the average price before and after it. In Table 2 the fact that the numbers are less than one shows a general price deflation in the American economy.

Terms-of-trade ratios are computed in rows 12 and 13 of Table 1 and rows 16 and 17 of Table 2. Sea Island cotton is used as the agricultural product in both countries. The numbers indicate a decline in the British terms of trade to a level of between 50.3 percent, when iron bars are used to represent manufactured goods, and 58.1 percent, when cotton twist is used. The decline in the U.S. terms of trade is also substantial, but not as large. The decline is to a level of 67.3 percent when nails are used to represent manufactured goods, corresponding roughly to the iron bars in Britain, and to a level of 68.4 percent when textiles are used.

Another four already-computed aggregate measures of the United States terms of trade, available from a recent paper in this JOURNAL by

TABLE 1
THE EFFECT OF THE EMBARGO ON PRICES IN GREAT BRITAIN

Item	*Before Embargo*	*During Embargo*	*After Embargo*	*Embargo/ Non-Embargo*
Agricultural Products				
1. Sea Island Cotton	53.021	87.500	49.843	1.719
2. Bowed Cotton	32.188	50.438	29.907	1.644
3. Wheat	1850	1952	2445	.900
4. Barley	936	1042	1154	.997
5. Oats	671	800	720	1.150
6. Cotton	32.75	44.00	35.25	1.294
Manufactured Products				
7. Cotton Twist	36.70	38.00	39.46	.998
8. Iron Bars	18.5	16.0	n.a.	.865
9. Copper	16.6	14.7	n.a.	.886
10. Pig Iron	3381	3000	3012	.939
11. Bar Iron	8040	7200	7200	.945
Terms of Trade (Man./Agr.)				
12. Iron Bars/Sea Island Cotton				.503
13. Cotton Twist/Sea Island Cotton				.581

Sources by Line:

1, 2 Prices in Liverpool, cents per lb. (January–December 1807, January 1808–February 1809, March–December 1809). G. W. Daniels, "American Cotton Trade With Liverpool Under the Embargo and Non-intercourse Acts," *American Historical Review*, Vol. 21 (1918–19), p. 276.

3, 4, 5 Average prices in pence per Imperial Quarter (1806–07, 1808, 1809–10). B. R. Mitchell, *Abstract of British Historical Statistics* (London, 1962), p. 488.

6 Price of Upland and Middle American cotton in U. S. cents per lb. (1806–07, 1808, 1809–10), ibid., p. 491.

7 Average prices in pence per pound (1807, 1808, 1809). Porter, *Progress of the Nation*, p. 185; as cited by Gayer, Rostow and Schwartz, *Growth and Fluctuation of the British Economy*, p. 101.

8, 9 £ per ton and pence per pound, respectively (January 1807, ave. of January 1808 and January 1809), ibid., p. 87.

10, 11 Midland Forge Pig Iron and Liverpool Bar Iron, in pence per ton (1806–07, 1808, 1809–10), Mitchell, *Abstract of British Historical Statistics*, p. 492.

12 Line 8 ÷ line 1.

13 Line 7 ÷ line 1.

Donald Adams, Jr., are reported in rows 18 to 21.[18] Three of them show an even smaller decline in the United States terms of trade. This probably indicates that changes in the prices of other agricultural products were not as great as the change in the price of cotton, a fact shown in our data on individual commodities for the United States, and for Great Britain as well. It may also reflect the fact that the yearly terms of trade indices necessarily mix a couple of months of Embargo prices in with the non-Embargo years.

It is possible to find pairs of British commodities in Table 1 for which

[18] "American Neutrality and Prosperity, 1793–1808: A Reconsideration," this JOURNAL, 60 (December 1980), 717.

TABLE 2
THE EFFECT OF THE EMBARGO ON PRICES IN THE UNITED STATES

Item	*Before Embargo*	*During Embargo*	*After Embargo*	*Embargo/ Non-Embargo*
Agricultural Products				
1. Sea Island Cotton	41.600	22.250	26.750	.661
2. Upland Cotton, Charleston	19.000	11.875	13.031	.751
3. Upland Cotton, Boston	21.555	16.877	16.333	.867
4. Flax	15.000	14.887	15.417	.977
5. Flour	6.903	6.098	7.299	.861
6. Corn	91.556	79.568	85.24	.896
7. Farm Products	93.5	71.0	86.5	.789
8. Foods	146.0	113.0	134.0	.807
9. Rothenberg Index	113.5	98.6	110.95	.879
Manufactured Products				
10. 2d Nails	26.000	26.128	27.500	.982
11. Gunpowder	40.833	59.049	62.667	1.191
12. White Lead	18.500	18.346	20.417	.952
13. Bristol Glass	15.375	16.387	18.833	.949
14. Textiles	277.0	279.0	300.5	.966
15. Chemicals and Drugs	479.5	455.0	510.5	.919
Terms of Trade (Agr./Man.)				
16. Sea Island Cotton/Nails				.673
17. Sea Island Cotton/Textiles				.684
18. North Index	109.3	92.8	94.55	.910
19. Domestic Imports	105.75	90.7	91.65	.919
20. Agric/Industrial	91.8	75.3	79.05	.881
21. Boston Index	100.45	54.9	90.4	.575

Source by Line:

1, 2	Prices in Charleston, cents per lb. (January–December 1807, January 1808–February 1809, March–December 1809), Daniels, "American Cotton Trade."
3, 4	Cents per lb. (7/4/07–11/28/07, 12/5/08–3/6/09, 3/13/04–7/3/09), *Boston Gazette*.
5, 6	Superfine and Northern Indian, respectively; in dollars per barrel and cents per bushel, respectively (7/4/07–11/28/07, 12/5/08–3/6/09, 3/13/09–7/3/09), ibid.
10–13	Cut 10 lbs. per, foreign, dry, and crown 10 × 8, respectively; in cents per M, cents per lb., dollars per C, and dollars, respectively (3/4/07–11/28/08, 12/5/08–3/6/09, 3/13/01–7/3/09), ibid.
7, 8, 14, 15	Indices, 1910–14 = 100. (1806–07, 1808, 1809–10), G. F. Warren and F. A. Pearson, *Prices* (N.Y., 1933) pp. 11–13, 25–27.
9	Index prices received by farmers covering fifteen farm products, using 1800 weights. (1806–08, 1808, 1809–10), Winifred Rothenberg, "A Price Index for Rural Massachusetts, 1750–1855," this JOURNAL, (December 1979), 975–1001.
16	Line 1 ÷ line 10.
17	Line 1 ÷ line 14.
18	(1806–07, 1808, 1809–10), Douglass North, *The Economic Growth of the United States, 1790–1860* (N.Y., 1961), cited by Donald Adams, Jr., "American Neutrality and Prosperity, 1793– 1808: A Reconsideration," this JOURNAL, 60 (December 1980), 717.
19, 20	(1806–07, 1808, 1809–10), Anne Bezanson, Robert Gray, and Miriam Hussey, "Wholesale Prices in Philadelphia, 1784–1861," Part 1, University of Pennsylvania Industrial Research Study No. 29 (Philadelphia, 1936), p. 392, cited by Adams, "American Neutrality."
21	(1806–07, 1808, 1809–10), Walter Smith and Arthur Cole, *Fluctuations in American Business 1790–1860* (Cambridge, Massachusetts, 1935), pp. 146–47, cited and adjusted by Adams, "American Neutrality."

relative prices changed less than pairs of United States commodities in Table 2. But the weight of the evidence is with the numbers reported above, considering especially that they represent the closest available matching of commodities on both sides of the Atlantic.

Theory tells us that the large change in relative prices in Britain must have corresponded to a large change in consumers' marginal rate of substitution. If we were to assume uniform elasticities of substitution in consumption, this result would confirm the quantity argument of the last section, that the British economy was less able to make up the loss of raw material imports from the United States than the U.S. economy was able to make up the loss of manufactured imports from Britain. The Embargo pulled Britain farther away from its free-trade consumption bundle than the United States. On the other hand, if we were to assume that substitution in production was close to zero in both countries, then the larger change in relative prices in Britain would indicate that British consumers were less able to adapt to the loss of goods previously imported from the United States than were American consumers able to adapt to the loss of a similar quantity of goods (assuming roughly balanced trade) previously imported from Britain. Either way, the evidence points toward greater economic suffering on the part of Britain than the United States.

This conclusion depends heavily on the price statistics, however, particularly those for cotton in Charleston and Liverpool. One way we can verify the reasonableness of the numbers, at least for the pre-Embargo period, is to determine whether the difference between the American and British prices can be explained by customs duties and transport costs. The Charleston cotton agent's records indicate that the exchange rate was at par through most of 1807. Converting the average Liverpool price for Sea Island cotton to United States currency reveals that it was 27.5 percent higher than the Charleston price. Can we explain this difference?

If we assume that 85 percent of the cotton was carried in United States ships and 15 percent in British ships, and convert the appropriate British customs duties from the *Journal of the House of Commons* to American currency, we find that those duties represent 18.5 percent of the Charleston price. The cotton agent's records indicate that the cost of freight from Charleston to Liverpool was 3 cents per pound throughout most of 1807, or 7.2 percent of the Charleston price. The only item that remains to be accounted for is the risk to the cargo arising from a transatlantic voyage. Fortunately, the *Boston Gazette* each week recorded shipping insurance premiums; they were 3.5 percent on voyages to English ports (until British and French policies began to raise the risk of seizure towards the end of the year). Thus we have accounted for a total of 29.2 percent of the Charleston price, which corresponds very well to the 27.5 percent differential we are trying to explain.

We can also use this technique to check once again that the Embargo was well-enforced. By the last two months of the Embargo, the Liverpool price had risen to a level 293.3 percent higher than the Charleston price (that is, almost four times as high). The British duty now accounts for 34.6 percent (since the Charleston price is now much lower and the duty is by weight rather than by value). Freight rates are reported to be about 6 cents per pound (higher presumably due to the risk to the ship and its crew from foreign seizure), or 26.9 percent. The *Boston Gazette* stops reporting insurance premiums in January 1808 and does not start again until June 1809 (the number is 5 percent both before and after); but a speech on the floor of the Senate on November 30, 1808, cites 9 to 10 percent as the rate on cargoes for ships that abide by the British Orders in Council. Another 9 to 10 percent can be accounted for by the fact that the price of foreign exchange on London was reported to be above par in January 1809. Adding all these figures still leaves over 200 percent of the Charleston price, or over 45 cents per pound of cotton, unaccounted for. This amount represents the pure profit to be made by any smuggler able to evade the Embargo. The magnitude testifies to the effectiveness with which the Embargo was enforced towards the end of its reign.

CONCLUSIONS

We have demonstrated (1) that the Embargo was well-enforced, so each country was reduced practically to autarky vis-a-vis the other, and (2) that the effect of the Embargo was to change relative prices, and thus to lower the real value of consumption, in Britain more than in the United States. Britain was evidently less able to make up for the loss in agricultural products previously imported from the United States than the United States was able to make up for the loss in manufactured goods previously imported from Britain.

Why then did the Embargo fail in its purpose of forcing Great Britain to acknowledge the right of neutral American shipping to be free from seizures? The answer is political. There was no doubt within the British cabinet (even if there may have been some among the British people) that Napoleon had to be defeated at all costs, and that cutting off his supplies from overseas was important to this end. The American democracy, on the other hand, was divided from the start between the Federalists, who generally supported Britain, and the Republicans, who generally supported France. Federalist opposition to Jefferson and his Embargo grew until in March 1809 both were replaced. Perhaps it was inevitable that the Embargo should fail, but if so, it was not because the United States lacked the economic power to make it an effective weapon.