Abstract - From 1785 to 1815, U.S. shipping was subject to capture by the Barbary powers in North Africa. The U.S. government paid these powers for treaties to reduce the predation, and maintained a naval presence to protect its shipping. The Barbary powers appear to have price–discriminated in ransoming captives. Using 1805 as a reference year, the U.S. appeared to be spending between 0.5 to one million dollars in combined costs of protection payments for treaties, naval operations, and disruption to shipping. This probably amounted to 0.1 to 0.2 percent of income, equivalent to $10 billion to $20 billion in today’s economy.

INTRODUCTION

Bruce Davie was known for his interest in U.S. economic history. He taught economic history, was especially knowledgeable about the history of technology, and had an encyclopedic knowledge of U.S. fiscal history. While the following does not relate directly to taxes, or Bruce’s work, it is the kind of history that interested him. And were he alive, he doubtlessly would have offered many emendations and corrections to it.

In the aftermath of 9/11 and as the U.S. increased its military involvement in the Middle East, a number of observers pointed out similarities to America’s dealings with the Barbary Pirates in the early days of the republic. The perception of parallels is understandable. The U.S. became militarily involved with Islamic powers thousands of miles away. Assembling an international coalition proved difficult for familiar reasons, including France’s desire to do business with the powers involved. American hostages were taken and held. As part of its activity there, the U.S. sponsored an attempt at a regime change. It abandoned that attempt and left most of the local participants at the mercy of the existing regime.

Unlike many foreign affairs, the costs and benefits of this one are unusually quantified. The goals of both sides were mercenary and commercial. While data are not good enough for rigorous econometric treatment, there are sufficient data for some economic analysis. It is possible to examine many of the sums involved to determine something about the incentives faced by both the Barbary powers and those powers engaged in Mediterranean commerce.
WHO WERE THE BARBARY PIRATES?

The Barbary powers were Morocco, Algiers, Tunis, and Tripoli (some lesser states, such as Barca, are sometimes included, but these were considered parts of the aforementioned four, especially in the time-frame relevant for this discussion). Morocco was an independent state, ruled by an emperor. The other three powers were nominally part of the Ottoman Empire, and ruled by a Dey, Bey, and Pasha (or, Bashaw), respectively. By the time of the U.S.’s involvement with them, the Dey of Algiers was still selected by the city’s Turkish garrison from among its own members. But Tunis had received recognition from Constantinople of its hereditary leader, while Tripoli was transitioning de facto to a similar arrangement.¹

Piracy had a long presence in the Mediterranean, and in many respects is difficult to distinguish from legitimate war-making activity. This is especially true of the period of tension between Christian Europe and its Islamic foes. Raiding the shipping of enemy countries and taking passengers and crew as slaves was standard practice on both sides. Many of these captives were needed to row the galleys that were the common naval vessels in the Mediterranean prior to the 1600s. With no diplomatic relations between the two sides, war was virtually continuous, and both sides regarded their predation on the other’s shipping as legitimate naval operations.

Concentration of this activity in the North African Barbary states and its persistence into later times began when two pirate brothers, Kair–ed–Din and Arouj (both eventually known as “Barbarrosa”) came to Algiers from Lesbos in response to the locals’ plea for help against the efforts of Europeans to extend control over parts of North Africa. By 1520, they made it a base for harassing the European powers and sealed their position by offering nominal authority to Sulemein in Constantinople.

In a short time, other ports in North Africa also became bases from which to harass European shipping. And in the early 1600s, the effectiveness of these efforts increased when James I of England halted privateering against the Spanish. A number of the English (and Scotch and Dutch) sea dogs who had been so effective against Spain under Elizabeth I chose to ply their trade for the Barbary States rather than retire. Bringing North European sailing technology with them, large sailing ships displaced most of the oar-driven galleys, and spread Barbary activity into the Atlantic. Raids by the pirates ranged as far north as Ireland.

In 1662, England established diplomatic relations with Algiers. Ending the nominal state of war between them, the treaty constituted an agreement by a Barbary power not to raid the shipping of a European power. While no explicit tribute was involved, there were substantial gifts and bribes as per the practice of the day. The Dutch followed suit with a treaty in 1668 which did involve explicit payments in exchange for peace between them. Other European governments followed their lead, so that by 1700 the Barbary powers had effectively established a protection racket to supplement their piratical income.

From the perspective of the Barbary powers, their seagoing activities were privateering, not piracy. By their reasoning, they were at war with anyone with whom they did not have a treaty. And this practice of naval warfare on shipping had a long pedigree shared with the European governments that eventually came to deplore it so vigorously. Furthermore, diplomacy of the day commonly entailed large bribes and gifts, and tribute was a

¹ This brief narrative history is derived from Fisher (1957), Lane–Poole (1890), Wolf (1979), and Wright and MacLeod (1945).
legitimate part of treaty-making. From the European perspective, the Barbary powers sponsored piracy. This view—if nothing else—was supported by the North African powers’ general lack of adherence to the niceties of prize courts and other aspects of Admiralty law.

By the end of the 18th century, the Barbary pirates were considerably less a naval threat than they had been 100 years before. Morocco was moving away from piracy, showing more interest in trade with Europe. And Algiers—the most powerful of the states—was subject to fairly continuous political instability. All had become relatively weak naval powers. But none of the European powers showed much interest or determination in eradicating the problem. Britain, in particular, found their existence useful, since, with the most powerful navy, it could also secure a treaties with them and protection from them that generated a cost advantage over other countries whose shipping was more likely to be harmed. The French did not oppose them because they were the principal trading partner with them. The remaining countries were generally too weak to make a serious challenge singly, and for a variety of reasons found themselves unable to act collectively.

THE U.S. AND BARBARY

The colonies that became the U.S. had been covered under Barbary treaties with Britain. Colonial vessels used the same passes as British vessels, and, therefore, if overtaken by the Barbary corsairs, were allowed to continue on their voyages upon presentation of these passes. Consequently, among the first acts of the British government after the declaration of independence by the colonies was to change the passes and inform the Barbary powers. U.S. vessels became fair game for Barbary, but few were harassed because the war so drastically reduced U.S. shipping.

The nascent U.S. government sought help from its French allies and even tried to get protection from Barbary written into the peace treaty with Britain. Thomas Jefferson, while a diplomat in France, explored collective action against Barbary among European powers. But none of these efforts bore fruit. In 1785, the first American vessel was captured by the Algerines, with its crew and passengers taken as captives. In the same year, the Congress, under the Articles of Confederation, appropriated $80,000 for treaties with the four powers.

Morocco proved the easiest to deal with. In 1777, Morocco had become the first country in the world to recognize U.S. independence, and followed the year after with a pledge not to molest U.S. ships. At Morocco’s initiative, a treaty was pursued. Yet, even with the goodwill shown by the emperor, the treaty was not concluded until 1787. And even though it involved no formal protection payments, the treaty is estimated to have cost the U.S. between $9,000 and $23,000 in various gifts and bribes (Field, 1969; Irwin, 1931; Savage, 1948; Office of Naval Records, 1939).

The Algerines captured two more U.S. ships in 1785, and the U.S. began quiet efforts to ransom the crew both directly and through one of the religious orders that were dedicated to redeeming captured Europeans. These early efforts failed and another 11 ships had been taken by 1793. The redemption of crews became part of the treaty negotiation. The final deal in 1795 was $642,500 plus annual tribute of $21,600 in naval stores. Delays in payment required adding more, including a 36–gun frigate. The total cost ran close to $1 million (Irwin, 1931; Savage 1948).

2 One report puts the figure at $9,000 to $10,000. Other sources put it at £5,000, or about $23,000.
3 A million dollars at the turn of the 18th century was about $12 million dollars today. But as a fraction of GDP, it was probably about 0.2 percent, or the equivalent of about $20 billion today.
In 1796, Tripolitan pirates captured the U.S. ship that was carrying part of the ransom money for Algiers. Under pressure from Algiers, they released the ship and entered into negotiations for a treaty of their own. With Algiers as guarantor of the agreement, the Pasha settled for a one–time payment of $56,486 in cash and gifts in 1796, all of which was delivered immediately (Irwin, 1931; Savage, 1948).

In 1796 Tunis began its approach to the U.S. by capturing a U.S. ship and demanding $10,000 ransom. They agreed to release the ship and granted a six–month truce to reach a treaty agreement. In 1797, they agreed to $107,000 in cash and stores, to arrive later (Irwin, 1931; Savage, 1948). Extended haggling over the details of the treaty continued over several years and long delays attended the payments.

While this process was under way, the slow progress in negotiations prompted Congress in 1794 to authorize the construction of six heavy frigates to provide a naval response to the Barbary threat. Under the terms of the legislation, construction would cease in the event that treaties with Barbary were achieved. But by the time the Barbary treaties were completed, three ships were so far along that they were nonetheless completed, with the first ships launched in 1797. Ultimately, all were completed as part of the substantial expansion of the navy over 1797–1799 due to undeclared naval conflict with France (Goldsborough, 1824; Office of Naval Records, 1939).

THE U.S. CONFLICT WITH TRIPOLI

One characteristic common to all diplomatic dealings with the Barbary powers was that no payment was ever final. For example, when the U.S. delivered its first annual tribute to Algiers, the Dey immediately impressed the frigate, George Washington, that delivered it to run an errand to Constantinople. When a fire destroyed a Tunis arsenal, the Bey allocated the cost of his loss “among his friends,” who were expected to cover it. When George Washington died, the Pasha of Tripoli told the U.S. consul that the appropriate gesture was to make a $10,000 gift (to the Pasha) to honor the ex–president’s passing (Wright and MacLeod, 1945). New gifts were expected when officials changed. And treaty terms were always open for renegotiation. These demands were sometimes acceded to, often negotiated, and occasionally rejected without repercussion.

Trouble with Tripoli began as part of this relentless and inventive pursuit of additional gifts, bribes, and tribute. In 1799, Tripoli claimed that it was promised a frigate like that presented to the Dey of Algiers. The Pasha nonetheless decided he would settle for another $50,000, and the U.S. paid about $25,000. Even so, in 1800, Tripoli captured and released a U.S. ship, and demanded an annual tribute. At the same time, Tunis also threatened war over delays in its payments, and indicated its desire for a frigate as well. In 1801, after the Pasha demanded $250,000 and annual tribute of $20,000, Tripoli declared war (Irwin, 1931; Savage, 1948).

Wartime operations of the U.S. consisted of escorting convoys of merchantmen, engaging Tripolitan cruisers on the seas, raiding Tripolitan shipping, and blockading and bombarding Tripolitan ports. The efforts were hampered by a number of problems, including the huge logistical problems of fighting a far–away war, the ability of the Tripolitans to keep their ships and trade out of U.S. reach, their willingness to sustain the damages of bombardment, and the inappropriateness of U.S. vessels for attacking coastal commerce. When, after more than two years of relatively ineffective operations, the U.S. began to vigorously and successfully prosecute the war, the frigate Philadelphia was captured in October 1803 and its crew held hostage.

The Philadelphia was burned by a party of U.S. sailors in Tripoli harbor in Feb-
ruary 1804. And a successful blockade using gunboats from Naples was finally implemented in July 1804. In April 1805, an overland attack on the city of Derne, led by former American consul to Tunis, William Eaton, and Pasha’s brother, made a regime change a real likelihood. The Pasha moved quickly to settle. In June, a treaty was agreed upon for a payment by the U.S. of $60,000 (for captives from the Philadelphia) and abandonment of the effort at regime change (Wright and MacLeod, 1945).

Problems with Barbary continued throughout Napoleonic era. The Algerines especially took advantage of the U.S.–British situation to capture more ships. At the end of war of 1812, a U.S. fleet under Stephen Decatur forcefully made all powers submit, with no payments made by the United States. The French and British then followed the U.S. lead. The Barbary powers were cowed into submission. The U.S. continued to maintain a Mediterranean squadron to help ensure the cessation of Barbary piracy; France absorbed Algiers in 1830, putting an end to the threat.

ECONOMIC ISSUES

The actors in these events faced several economic problems. The Barbary powers had to balance the joint production of protection and piracy. They also had to coordinate to avoid trying to extract too much rent from shippers. Finally, they had to gauge carefully the degree of price discrimination they could engage in. Countries wishing to ship through the Mediterranean had to make choices among the options for dealing with the Pirates: incurring disruption to their shipping, paying protection money, and making war.

Barbary Powers–Balancing Production

The Barbary powers jointly produced two outputs: piracy and protection. In general, to be at peace with a power meant that a treaty existed which called for payments, either one–time or periodical. Under a treaty, that country’s merchant shipping became ineligible for capture by corsairs. The powers explicitly sought to balance production. It was the announced policy of the Dey of Algiers, for example, to always be at war with someone.

The efficiencies in providing protection over piracy are obvious. The rationale for piracy was two–fold. First, protection income depended on the credibility of piratical threat, and credibility required continuous piratical activity. Second, piracy really did amount to a significant industry in at least three of the four states. It provided employment and income. Those whose economic interests lay with the industry put pressure on the rulers to allow it to continue. This included the assassination of Deys regarded as too willing to make treaties.

As a result, it was widely known that a treaty with one power would usually mean war with another. Numerous diplomatic dispatches couple the news of the conclusion of a treaty with another county with a warning that our own treaty might soon be renounced as a result. The balance is illustrated by a letter to U.S. officials in 1790 outlining the foreign relations of Algiers. At that time, Algiers was at peace with (i.e., collecting protection money from) France, Spain, England, Venice, United Netherlands, Sweden, and Denmark. It was at war with (i.e., raiding commerce of) Russia, Austria, Portugal, Naples, Sardinia, United States, and Genoa (Office of Naval Records, 1939).

Barbary Powers–Allocation of Rents

The Barbary powers faced a problem of allocating the available rents among each other. There was a maximum amount of rent to extract from the commercial powers. If the treaty costs were set too high, or the depredations of pirates were too great,
the commercial powers would either make war or—worse from the perspective of Barbary—stop shipping. But each Barbary power was largely free to set its own prices.

In the extreme, the problem can be modeled as something like complementary monopolies. Each of the powers can be thought of as a monopoly producer of protection from its own depredations. For example, only Algiers could sell protection from Algerine pirates. At the same time, the service is complementary if the probability of being captured is relatively high; paying for protection from Tunis is pointless if victimized by Tripoli. Consequently, uncoordinated efforts to garner rents could drive the joint cost of protection too high. Moreover, belligerence by one power could summon sufficient naval resistance to interfere with the piratical efforts of another.

Algiers was much more powerful than the other Barbary states, and some stability had been achieved through that fact. Some de facto division of rents that awarded most to Algiers seems to have been settled upon. One might note that Algiers brought pressure upon Tripoli to deal with the U.S. Indeed, one can make a good case that the primary cause for war with Tripoli was the latter’s efforts to become more powerful, disrupting a fragile equilibrium. In a few short years around 1800, Tripoli had increased its sea power and sought greater settlements from shipping countries. It was in fact the disparity between Tripolitan and Algerine settlements (in particular, the Bashaw’s desire for a frigate) that was the main impetus for the war. It is worth noting that a similar demand from Bey nearly precipitated war with Tunis as well.

Tripoli’s aggressiveness imposed costs on the other Barbary powers. A U.S. squadron arriving in 1803 to fight Tripoli captured two Moroccan ships that had just been dispatched to prey on U.S. shipping (Office of Naval Records, 1939). One cannot say with certainty, but it appears that aggressiveness of the demands of Tunis varied with the success of the U.S. naval squadron in its operations against Tripoli.

**Barbary Powers—Pricing Issues**

The Barbary powers set two kinds of prices: tribute for protection and ransom for captives. The various powers with whom they dealt ranged in their ability to pay and to oppose them militarily. The question arises as to whether they were effective price discriminators. Presumably, protection payments would have been positively related to the former and negatively related to the latter. Unfortunately, there are reasons to think these two would be correlated; the wealthier countries were also more likely to be the more powerful.

Treaty prices are difficult to extract from the record. Countries generally avoided explicit tribute. And many of the costs of gifts and bribes do not appear in the records. Britain, for example, never paid explicit treaty settlements, but was rumored to be spending about $280,000 per year in other forms (Office of Naval Records, 1939). Where amounts are available, it can be difficult to separate the costs of tribute from ransom costs. Spain, for example, paid between three and four million dollars to Algiers in 1790, and Portugal a similar amount in 1794. They then each paid one million to 1.5 million dollars in 1802–03 (Office of Naval Records, 1939). But one cannot tell if the price declined because captives were involved in each case.

Even where one has cost information, it is difficult to separate the wealth and naval threat effects. In 1802, Tripoli made treaties with both Denmark and Sweden. The former agreed to $30,000 up front and $5,000 annually, where the latter agreed to $150,000 up front and $8,000 annually (Office of Naval Records, 1939). Denmark had much more trade to protect, but had a big navy to defend it (the second larg-
The Costs of State-Sponsored Terrorism: The Example of the Barbary Pirates

Ransom prices are more revealing. Captives taken from ships were sold into slavery (with a portion allocated to the government for public works). Consequently, they had a shadow price equal to their marginal product as slaves, and also a potential ransom price if redeemed. Governments, families, and two religious orders organized for the purpose redeemed captives from North Africa. Certainly, the redemption price demanded by the Barbary powers could be varied by the likely wealth of the redemptors.

This was clearly the case. The U.S. government attempted to discourage relatives of the early captives from sending large remittances to them, since it gave the (correct) impression that the U.S. was a relatively wealthy country from whom a high price might be demanded (Office of Naval Records, 1939). Some hard evidence of discrimination is available in the form of redemption prices of captives.

If redemptors were simply charged the marginal product of the captives as slaves, one might expect the price to have dropped following the early 17th century substitution of sailing vessels for oared galleys, an important use of captives. Figure 1 shows slave prices based on the periodic visits of one of the religious orders that redeemed captives (Friedman, 1983). It shows no obvious decline in later years. Indeed, the price appears to have risen slightly.

But galley slaves reportedly were the employment of only about 25 percent of captives even when their use was at its height. And the average price could be profoundly affected by the specific slaves redeemed (the outlier in 1667 was driven almost entirely by one very important captive). Thus, the time series of prices is not conclusive.

Figure 2 shows the prices of 482 redeemed captives during a single visit by

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**Figure 1.** Slave Redemption Prices, 1575–1759 (prices constant in 1575 Spanish escudos)

Source: Friedman (1983); conversion to constant escudos by author.
the Spanish Mercedarian order in 1702 distributed by age of captive (Pérez, 1937). If the prices were based on values as slaves, they would presumably be negatively correlated with age, since the discounted value of their annual marginal product would increase with the number of years over which they could be worked. The distribution shows no such relation.

The conclusion is further buttressed by the pattern of initial asking prices by Algiers for the U.S. captives. While not the final negotiated price, the demand was $6,000 for captains, $4,000 for mates and passengers, and $1,400 for common sailors (Office of Naval Records, 1939). No data on the relative earnings of merchant captains, mates, and sailors are available for comparison. But the pay of their closest counterparts in the navy is available (Goldsborough, 1824). Figure 3 shows how that lines up with the Algerine demand. Using a discount rate of eight percent and an average remaining working life of 15 years, one can construct a measure of the discounted value of their future earnings. The result lines up rather impressively with the Algerine opening price bid. They appear on this slim evidence to be pretty good price discriminators.

**Commercial Powers**

Nations engaged in Mediterranean commerce could bear the costs imposed by the Barbary powers in three ways. They could pay protection, make war, and incur disruption to their shipping. In fact, most countries had to bear all three forms of costs to varying degrees. In general, some naval operations were necessary to enable negotiations. At the same time, some disruption to shipping was inevitable for the same reason (that is, from the pirates' side of negotiation), and because not all the pirates could read the passes. Protection payments were still necessary because the pirates were effective enough to ensure that no one could continue sailing too long without a treaty.

But while all three categories of costs were regularly incurred, less expenditure

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**Figure 2.** Age and Prices Paid for Captives, 1702 (price in nominal Spanish pesos)

Source: Pérez (1937).
in one area would have tended to generate more in one of the other two. Hence, commercial powers involved faced an optimization problem with respect to the balance of the three costs. The interesting exercise would be to determine the optimal balance of these three costs. Data are not available for this exercise, but it is possible to get some idea of what it was costing the U.S. when not actually at war with the powers, paying what protection it could get away with, and bearing the concomitant commercial disruption.

Commercial Powers—Cost of Tribute

How much did the U.S. pay the Barbary powers in protection payments? The amounts are difficult to ascertain. Some of the gifts are buried in other diplomatic accounts. These could be substantial; in 1802, for example, the U.S. spent more than $43,000 on gifts to the Bey of Tunis (Office of Naval Records, 1939). Some costs, such as the impressment of the George Washington, would appear as naval expenditures. In some years, the expenditures on the Barbary powers are clearly broken out in Treasury budget statements (Secretary of the Treasury, 1801–1814). But in others, they are not separately identified. Amounts for the years 1806–1812 are especially problematic.

Figure 4 provides the best guess of the costs over the period 1795–1814. The first few years are atypical. After that, the amounts frequently exceed $100,000 and rarely fall below $50,000. A reasonable guess is that for the U.S., an annual steady-state cost of protection money would have run about $50,000 to $100,000 a year during the period.

Commercial Powers—Cost of Naval Operations

One cannot help but notice that both of the U.S.’s major naval operations against Barbary powers—the Tripolitan war and Decatur’s expedition in 1815—immediately followed other naval wars: the undeclared naval war with France in 1797–1799 and the War of 1812. One is led to speculate that in the aftermath of
these two conflicts, in which the U.S. naval forces were built up, it made sense to employ these resources that were already largely paid for to deal with the chronic problem of Barbary.

Closer inspection, however, suggests that the timing was indeed coincidental. The hypothesis rests on the supposition that fixed costs of a navy were high relative to variable costs, so that additional conflict added relatively little to costs on the margin. This is a reasonable hypothesis by today’s navy, in which the ratio of fixed to annual operating costs can range from 10:1 to 100:1. But it does not appear to be true of the early navy.

Figure 5 shows the construction costs versus operating cost of various sized naval vessels ranging from a 44–gun heavy frigate to an 18–gun brig (Goldsborough, 1824). For none of the vessels does the ratio exceed 2:1; and for many it is about 1:1. The operating cost does not include depreciation. Moreover, it does not reflect wartime use of powder and shot, which would be much greater than the amounts with which the ships are initially outfitted—the basis for the cost in the figure. Hence, if anything, the graphic overstates the actual fixed–to–variable cost ratio. One would reasonably conclude that the wars with Barbary were not opportunistic in this sense.

Most relevant to the issue of balancing the various costs of Barbary piracy is what it cost to maintain a credible deterrent. Figure 6 shows the naval expenditure between 1794 and 1816 (Secretary of the Treasury, 1801–1814). The first peak in Naval spending, around 1800, is due to the navy buildup under President Adams to deal with the French. The Jefferson administration was rapidly reducing naval expenditures at the time the Tripolitan war began. And at no time during that conflict did naval outlays rise to their earlier heights.

As the figure shows, naval expenditures during the conflict ran about $1.2 million each year. That number, however, includes construction. It also includes other naval costs not associated with the Mediterranean deployment. The annual cost of operations against the Tripolitans...
Figure 5. Cost of Naval Vessels, about 1798 (in thousands of nominal U.S. dollars)

Source: Goldsborough (1824).

Figure 6. Naval Expenditures, 1794–1816 (in thousands of nominal U.S. dollars)

Sources: Secretary of the Treasury (1801–1814).
was probably closer to $600,000. This is based on a six-month deployment of a squadron of two frigates, two brigs, and three schooners—fairly typical during the war (Goldsborough, 1824). The estimate includes depreciation (straight line, 20 years) and the cost of the one-month passage each way across the Atlantic. A peacetime squadron would have been a third to half that size.

**Commercial Powers—Cost of Commercial Disruption**

It is possible to discern much of the cost of disruption to U.S. commerce in the Mediterranean from insurance rates. These will at least provide some estimate of the potential losses of goods and vessels to piracy there. (They will not, however, include costs associated with the capture of passengers and crew.)

Figure 7 shows insurance rates in 1798, shortly before and shortly after the launching of the first ships of the U.S. navy. These data were first used to provide evidence of the cost effectiveness of the navy (Goldsborough, 1824), demonstrating how rates fell following the launch of the first ships. The rates, however, are wartime rates; they date from the naval war with France. More normal rates, based on examinations of other sources, appeared to hover in the five to 10 percent range (Gillingham, 1933). Nonetheless, a Barbary premium appears to be evident. Ships sailing into the Mediterranean appear to have paid about a 30 percent premium over others. This is consistent with other reports of the time. For example, a diplomatic dispatch in 1793 reporting a treaty between Portugal and Algiers also reported a 10 to 30 percent increase in insurance rates for U.S. Atlantic shipping because the Algerines were no longer bottled up at Gibraltar (U.S. Naval Records, 1939).

A 30 percent Barbary premium implies approximately two to three cents per dollar on top of normal insurance premiums under treaty conditions. About five to 10 percent of ocean-going U.S. commerce appears to have been in the Mediterranean.

**Figure 7. Insurance Rates—1798 (U.S. to and from various destinations; percent of insured value)**

![Insurance Rates Graph]

Source: Goldsborough (1824).
under treaty conditions. In 1805, total exports and imports were about $200 million, and the merchant fleet was about one million tons (U.S. Bureau of Census, 1976), which Goldsborough (1824) values at $36 a ton. This suggests that cost of disruption under treaty conditions was between $250,000 and $600,000 a year.

**Total U.S. Costs of Dealing with Barbary**

Thus, even under something like steady-state conditions, the Barbary pirates imposed annual costs on the U.S. in the nature of about (1) $50k to $100k in protection payments, (2) $200k to $400k in naval protection, and (3) $250k to $600k in insurance costs. Except in the case of decisive military action, decreasing either of the first two would have increased the others. Total annual cost would have run about 0.5 to one million dollars. Assuming that government outlays and revenues were about two to 2.5 percent of GNP during the non–war years of the period (about what they were for later years when income estimates are available), then these costs were about 0.1 to 0.2 percent of GDP, equivalent to about $10 billion to $20 billion in today’s economy.

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4 This is inferred from limited data on tonnage from the period (U.S. Naval Records, 1939) and consistent with export and import values reported by the Bureau of the Census (1976).