Civil War and Willingness to Pay for Independence:
The American Revolution

Paul Hallwood
University of Connecticut

Working Paper 2011-15
July 2011
CIVIL WAR AND WILLINGNESS TO PAY FOR INDEPENDENCE: THE AMERICAN REVOLUTION

Paul Hallwood
Professor of Economics
University of Connecticut

Department of Economics
University of Connecticut
1084 Shennocossett Road
Groton
CT 06340.

Abstract: This paper uses a similar theoretical approach to that in the modern literature on the propagation of civil wars to assess the causes of the American Revolution. Economic causes are weighed relative to political causes as a contribution to the more than 200-year inconclusive debate among historians as to why the Americans rebelled. The key question investigated is whether the economic benefit of leaving the Empire was great enough to warrant bearing the expected cost of war with Great Britain? The main finding is “no”, and that political grievances must have played the predominant role in sparking the American Revolution.

Key words: American Revolution, British Empire, civil war, causes of war, war of secession.

JEL Classification: F5, K33, N40, P48.

JULY 2011
CIVIL WAR AND WILLINGNESS TO PAY FOR INDEPENDENCE: THE AMERICAN REVOLUTION

This paper uses a similar theoretical approach to that in the modern literature on the propagation of civil wars to assess the causes of the American Revolution. Economic causes are weighed relative to political causes as a contribution to the more than 200-year inconclusive debate among historians as to why the Americans rebelled. The key question investigated is whether the economic benefit of leaving the Empire was great enough to warrant bearing the expected cost of war with Great Britain? The main finding is “no”, and that political grievances must have played the predominant role in sparking the American Revolution.

I: Introduction

In the modern literature on the motives for civil war a distinction is drawn between the economic, a desire for increased income, and a desire to relieve political burdens such as a perceived lack of democratic voice. Besley and Persson (2008) include both economic and institutional values in insurrectionists’ objective functions and argue that their theoretical “exercise reflects our belief that it is hard to investigate the causes of civil war empirically without beginning from an explicit theory” (page 2). Similar economic models of insurrection are offered by Hechter (1992), and Miguel, Satyanath and Sergenti (2004). Grossman (1991) argues that the propensity for insurrection is negatively related to the opportunity cost of insurrection – measured as the level of income forgone in non-insurrectionist activities. The opportunity cost of insurrection figures prominently in the scenarios presented below, and it is found to be crucial in weighing the relative contributions of economic and political motives in the American Revolution.¹ Collier

¹ The Declaration of Independence complains about both economic and political burdens of colonial status, with political grievances against the Crown being the more prominent: “the history of the present King of Great Britain is a history of repeated injuries and usurpations, all having in direct object the establishment of an absolute tyranny over these states”. An economic concern was the “cutting off our trade with all parts of the world”.
and Hoeffler (2004) neatly call these motives, respectively, ‘greed’ and ‘grievance’; and in their empirical work on modern civil wars find that the former motive predominates: insurrection is motivated by economic gain rather than putting to rights political grievances. The main empirical finding in this paper is the opposite, namely that grievance, against the unwanted treatment of American democratic institutions by the British Empire in the years following the end of the French and Indian Wars, was the main motivating factor for the American Revolution; economic motives were of secondary importance. Like the forgoing authors, this paper uses a neoclassical decision-making model in which rational decision-makers take a view on expected benefits and costs of insurrection and choose whether to rebel or not. This modeling approach contrasts with the existing vast literature on the causes of the American Revolution which I would characterize as based on ‘historical judgment’.

Historians have swung between emphasizing the economic objective of increased income per head once outside the British Empire and a desire for relief from the political burdens of colonial status. The contemporary historian Ramsay (1789) emphasized that the colonists fought for constitutional principles; nine decades later, Bancroft (1876) for economic gains; Schlesinger (1917) and Miller (1943) that there were clashing economic interests with Great Britain; Gipson (1954) a clashing of both economic and political interests; Morgan and Morgan (1953) and Robson (1966) constitutional issues. Bailyn (1992) succinctly restated the political motivations of the Revolution: “study of the pamphlets confirmed my rather old-fashioned view that the American Revolution was
above all else an ideological, constitutional, political struggle and not primarily a controversy between social groups undertaken to force changes in the organization of the society or the economy” (p. x, 1992).

Why so much disagreement? Smith (1960) had an answer: “There is, or has been so far, no panacea (like scientific method) which can perform for the historian the functions of judgment and analysis” (page 76). Beginning in the 1960s some historians tried to settle the matter by quantifying the cost of trade restrictions to the American colonists. However, as they had no scale against which to measure the cost of colonial status they could not tell whether estimated benefits of Independence were a lot or a little – see Thomas (1968), McClelland (1969), Ransom (1968), Hughes (1969), Egnal and Ernst (1973), Reid (1978). Consistent with the theoretical literature on the causes of modern civil wars, it is argued here that the prospective cost of a War of Independence is as crucial a variable as is expected benefit of Independence in the decisions taken by colonists to revolt against the Crown. Fortunately, data on the cost of the American Revolution is available and it is used to estimate the relative contributions of the more-strictly economic and the more-strictly political motivations in the American Revolution.

Neglect of war cost at least to some extent explains the inconclusiveness of this more than two hundred year old literature. Indeed, Whaples (1995) asked a large number of historians whether ‘the economic burden of British policies was the spark to the American Revolution’. The poll was inconclusive as in reply 47% either agreed or agreed with provisos, while 53% disagreed. By introducing empirical data on war costs it
is possible to answer questions such as ‘were the economic burdens of British Empire membership great enough to warrant accepting the costs of Revolutionary War?’ And, what were the relative economic and political burdens of Empire membership as implicit causes of the American Revolution’?²

II: Methodology

Were the Revolutionaries really calculators of expected benefits and costs of war? David Ramsay (1789) thought so. Thus, following the Boston Port Act of March 1774:

“They [the patriots] commenced an opposition to Great-Britain, and ultimately engaged in a defensive war, on speculation. They were not so much moved by oppression actually felt, as by a conviction that a foundation was laid, and a precedent about to be established for future oppressions. To convince the bulk of the people, that they had an interest in foregoing a present good, and submitting to a present evil, in order to obtain a future greater good, and to avoid a future greater evil, was the task assigned to the colonial patriots. But it called for the exertion of their utmost abilities” (1789, page 105).

It is not supposed that anyone sat down in 1775 with a sharp pencil and worked out the equations set out below; rather, we follow the standard methodology of Friedman (1953)

² There is also a literature on the optimum size of states, or, more generally, ‘political units’ such as empires - see Alesina, Spolaore and Wacziarg (2000), Alesina and Spolare (2005), Bolton, Roland and Spolaore (1996), Bolton and Roland (1997), and Wittman (1991). However, this literature also overlooks the costs of war in the formation of new political units. Thus, in this literature, large size has benefits - such as the advantages of specialization and trade according to regional comparative advantage as well as economies of scale in the provision of public goods. However, large size has costs too, largely due to differences in preferences across populations over the choice of public goods. Optimum size alters as the arguments in these benefit and cost functions change over time. Using these ideas it is easy to describe some events that led to the American Revolution. Thus, defeat of the French in North America in the French and India Wars (1756-1763) reduced the need as perceived by some colonists for low-cost provision of defense ‘services’ (a public good) through the British Empire; George III and the British Parliament in the dozen years prior to 1775 tried to impose a system of government (another public good) that did not match the preferences of the American colonists; and restrictions on trade (through the Navigation Acts), far from promoting beneficial specialization and exchange reduced colonial income per head. However, what is absent from this ‘optimal size’ literature is a strong theoretical basis explaining why secessions are often preceded by civil war. Change in optimum size is not the whole story; somebody has to make it happen, often by force of arms.
and Demsetz (1967) - that decision-makers acted as if they knew the relevant benefit and
cost functions. The noted military historian Carl von Clausewitz, writing only a few
decades after the American Revolution, said that the choice between war and not war
must be based on the expected costs and gains of war.³

Our benefit-cost analysis of investment in Revolutionary War assumes that
Revolutionaries would have made the best guesses possible as to the values of the
parameters critical to them and summarized in the following equations. They probably
sensed that for several decades income per head in the 13-colonies had been growing but
that it might eventually grow more quickly with Independence. They could well have
sensed that income per head would fall while war was in progress, indeed, as the war
went on this would have been their experience; similarly, that they would have to give up
a portion of their incomes to finance that war; and that in the aftermath, income per head
would grow rather slowly – at the very least because foreign trade would have to
restructure itself. We don’t know what these and other parameter values in the minds of
the Revolutionaries would have been; the best we can do is to assume that their guesses
were reasonably close to what historians have estimated actually happened – that the
colonists were realists and did not dream of impossibly large economic benefits.

A Revolutionary’s maximization problem

An American colonist is modeled to become a Revolutionary when the perceived burden of Empire membership is larger than the expected war-cost incurred in fighting a War of Independence.

The expected gross economic benefit at a moment in time, \( t \), for an American Revolutionary of seceding from the Empire is measured in terms of the expected increase in per capita income \((i)\):

\[
E(i) = \sum_{t=1}^{T} \left[ \frac{p_r(i_{\text{independence}})}{(1 + r)^t} + \frac{(1 - p_r)(i_{\text{empire}})}{(1 + r)^t} \right]
\]

Where \( E(i) \) is the weighted average expected present value of per capita income with Independence; the weight, \( pr_t \), is the subjective probability of gaining sovereignty in any given year \( t = 1 \ldots T \); therefore, \((1 - pr_t)\) is the probability of not having gained sovereignty in year \( t \); \( r \) is the decision-makers’ discount rate; \( i_{\text{independence}} \) is the annual per capita income that would be earned if sovereignty was won. \( i_{\text{empire}} \) is per capita income if sovereignty is not gained.

If Independence is not yet achieved a Revolutionary may wish to fight on. However, war-cost (measured as a percentage of annual per capita income) is incurred. The expected discounted present value of war-cost is:

\[4\] According to John Adams about one-third of Americans were patriots, one third loyalists and one third were neutral.
(2) \[ E(\text{war\_cost}) = \sum_{i=1}^{K} (1 - pr_i) \left( \frac{($\text{war\_cost}_i)}{(1 + r)^i} \right) \]

Where \((1 - pr_i)\) is again the subjective probability of not having sovereignty in any given year, \(t\). War-cost is incurred over the period \(t = 1 \ldots K\). In year \(K\) the war ends either with Independence won, and if not, the 13-colonies would remain a part of the British Empire.

War-cost has two components, direct and indirect. Direct war-cost is the cost of raising and provisioning the Revolutionary army and small navy. Indirect war-cost, akin to Grossman’s (1991) opportunity cost of insurrection, is the cost of lost output - other than due to the shift of resources to the military sector caused, for example, by the British blockade of American ports, war damage and the cost of lost human capital – war dead and emigration by economically productive loyalists.

The expected net present economic value to a Revolutionary of continuing to fight for Independence is measured as the discounted net increase in per capita income:

(3) \[ E(\text{net increase in } i) = E(i) - E(\text{war\_cost}) \]

We know that the American Revolution happened. If the economic burden was not great enough to provoke war something else must have been involved.

This something else is the perceived political burden of Empire. Thus,

(4) \[ \text{Perceived total burden of Empire} = \text{Estimated economic burden} + \text{WTP to relieve perceived political burden of Empire} \]
Historians have estimated the size of annual lost income per head (the economic burden) caused by operating under British mercantilism. Willingness to pay (WTP) to relieve perceived political burdens of Empire membership is measured later as the fraction of colonial income per head that colonists would be willing to sacrifice to obtain Independence.

Diagram 1 is a representation of how quantified benefits of Independence are compared with the quantified costs of achieving it. For a colonist to become a Revolutionary the expected total benefit of Independence (expected economic benefit plus WTP for relief from perceived political burdens) would have to be greater than the expected cost of Revolutionary War. As shown in Diagram 1 political benefits are larger than economic benefits – and this is what we will find.

*Diagram 1: Schematic representation of the contributions of expected economic benefits and WTP for political benefits as causes of the American War of Independence*

An assessment of the proximate causes of the American Revolution requires realistic parameter values for the economic burden of Empire, the expected cost of war and
expected income changes both during that war and in the decades following, and other variables contained in the equations. Moreover, as benefits and costs fall at different points in time, potential Revolutionaries would have to judge whether it was “worth it” – they would have to have had insight into their own degree of impatience. They would have had to think about what was a reasonable payback period on their investment in war. Waiting 10-years for a positive payoff is one thing, waiting 20-years is another, especially given the relatively short life expectations of that generation. Moreover, a potential Revolutionary would have to assess what proportion of costs and benefits of Revolution would fall on them. Would they, for example, individually benefit greatly while most costs were borne by non-Revolutionary colonists; or, would they bear a disproportionately large share of the cost of war with most of the expected economic benefits being reaped by others?  

None of the empirical values used in the scenarios presented in section IV can be known for sure - so sensitivity calculations are performed. The results are encouraging because the general conclusions are not particularly sensitive to the choice of some critical parameters such as the discount rate, expected income growth in the long-run, and the probability of victory during each of the war years. They are however sensitive to the expected cost of war and growth rate of income per head during the war.

---

5 Gross gives examples of war-cost shifting in the town of Concord (1976, pp 147-153); for example, voluntary enlistment in the Revolutionary army was replaced by the draft in the summer of 1776, and for two years after that by pulling names from a hat. But if rich enough somebody who was drafted could pay for somebody else to go in their place – as Gross points out, the Revolution became a ‘poor man’s fight’, Gross (1976) page 147.
The analysis will test the main contentions put forward by historians: namely that the economic burden of colonial status in the British Empire following the end of the French and Indian Wars in 1763 had become too great to bear; that the economic cost of colonial status was concentrated on a relatively small group of colonists, provoking them to revolt; and that economic growth would accelerate if colonial status was replaced by an independent United States.

We will also test the contrary view that the American Revolution was motivated only in a minor way by a desire for economic gain, rather, by a desire for political independence from British rule in which to build an American democracy. Moreover, a weighting of the relative importance of economic and political motivations in the American Revolution will be attempted.

The paper proceeds as follows: section III gathers empirical estimates of the parameter values to be used. Section IV uses these estimates in a series of scenarios covering the expected benefits and costs of the Revolutionary War. Section V runs a further set of benefit-cost calculations designed to highlight the contribution of a desire to be relieved of the political burdens of colonial status. If, as is the case, expected economic return is judged insufficient, a simulated willingness to pay to relieve perceived political burdens is increased until the total burden of Empire membership is large enough to provoke Revolution as described in equation (4) and Diagram 1. It is then possible to divide that total burden of Empire membership into economic and political burden components, with the relative contribution of each calculated. Section VI draws conclusions.
III: Magnitudes of the empirical coefficients

The magnitudes of the parameters used in the preceding model are.

1) Using information in Bullock (1895), Manning (1956), Ferguson (1969) and Perkins (1994) it is possible to place the direct, or financing cost, of the Revolutionary War to the colonists in the range 3 to 5 percent of colonial income per head over each of the six years of active fighting. As already mentioned, there are indirect costs as well, such as the cost of war damage. Estimates for the American Civil War place indirect costs greater than direct costs (Goldin and Lewis, 1975). Even though the Revolutionary War was far less destructive than the Civil War, it is still easy to justify annual Revolutionary War costs in the range of 5 to 6 percent or more of income per head.

2) The net economic burden of the British Empire on the American colonists due to trade restrictions is placed by a number of researchers at less than 3 percent of annual income per head\(^6\); with 1.0 percent being closer to the mark. See Thomas (1965), Ransom (1968), McClelland (1969), Walton (1971), Reid (1978).

Another economic burden of the British Empire on the American colonists identified in the literature is that the rate of income per head growth was expected to be faster outside compared with inside the Empire. Placing values on this is not necessarily straightforward because it is reasonable to form expectations for three

---

\(^6\) The net burden subtracts the benefits of colonial status, such as access to British markets, from the gross burden caused by the trade restrictions.
different periods – expected income growth rates during the severe disruption of the Revolutionary War, in the two decades after 1781 when the economy was restructuring; and in the ‘long-run’ – taken to be 1800 to 1840. Moreover, to ascertain the benefit of Independence these growth rates should be compared with a counterfactual growth rate of what it would have been had the Revolution not happened? The easiest way to treat this counterfactual is simply to project the long-run colonial rate of income per head growth into the future. Thus,

3) According to Gallman (1972), Jones (1980) and McCusker and Menard (1991) the annual average rate of growth was close to 0.5 percent in the several decades leading up the Revolution

4) There are no ‘hard’ numbers on rates of per capita income growth during the Revolutionary War. However, it is easy to justify annual growth rates of between zero and minus 2 percent per annum - see the descriptive evidence of McCusker and Menard (1991).

5) Estimates by several authorities - North (1961), Bjork (1964), Gallman (1994), indicate very little or no growth in income per head in the 1780s but with some recovery in the last decade of the eighteenth century. Using a figure of 0.5% per annum growth 1781-1799 is probably on the high side, but it is the one used in most of the scenarios in the next section – it therefore tends to favor the economic-causes hypothesis.
6) Long run growth in American income per head – in the period from about 1800 to 1840 – has been estimated to be in the range 1.0 to 1.5 percent per annum – see David (1967), and Johnston and Williamson (2008). This growth rate can also be inferred from Taylor (1964) and Gallman (1972) who cover the period but beginning in 1775.

7) Both expected costs and expected benefits of Revolution have to be weighted by the expected probability of victory – a high probability of victory reduces expected costs and increases expected benefits (in both cases because the war is thought sooner to come to an end). According to George Washington the probability in 1776 of the colonists defeating the British was very low. For example, addressing the President of Congress, August 10th, 1780 he said:

“Had we formed a permanent army in the beginning, which by the continuance of the same men in service had been capable of discipline, we should never have had to retreat with a handful of men across the Delaware in 1776, trembling for the fate of America which nothing but the infatuation of the enemy could have saved; we should not have remained all the following winter at their mercy…liable at every moment to be dissipated, if only they had thought proper to march against us”.

This statement suggests an initial very low probability of victory, perhaps only 1%. Even so, sometimes I use an initial year probability of 20 percent and increase this in steady annual increments as the war went on. This again favors the economic-causes hypothesis because, as just explained, it increases expected benefits relative to expected costs of Revolutionary War.

8) The choice of discount rate is based on empirical estimates using modern wage data of implicit discount rates in jobs involving significant death risk – see Moore and Viscusi (1988, 1990a and 1990b), Viscusi and Moore (1989), and Shanmugan (2006). These estimates vary quite a lot but average about 7.9 percent. Discount rates used in the following scenarios are in the range of 3.0 to 7.5 percent, most usually the 3.0 percent figure. The latter is the discount rate of war cost used in Goldin and Lewis (1975) Civil War study.

9) What is a reasonably short payback period for accepting the costs and risks of war? It is hypothesized that a colonist would become a Revolutionary if a positive payback (discounted benefit exceed discounted cost – equation (4)) occurred relatively quickly. This is justified on the basis that the Revolutionary leaders were quite wealthy so their opportunity cost of War was high. Secondly, according to Gross (1976), at the outbreak of hostilities in Concord, the Revolutionaries there did expect a quick victory. Thirdly, if the Revolutionary leaders were fighting only for higher income per head outside of the Empire it is relevant to consider their ages and life expectancy. According to Fogel (1986), in the 13-colonies in the 1770s, life expectation was only about 55 to 56 years. But in 1775 George Washington was already 43-years old, John Adams 40, and Thomas Jefferson 32. Moreover, many of those that stood to benefit materially from the Revolution - the rich merchants and plantation owners would

---

8 Revolutionary soldiers certainly incurred a non-zero probability of death, and even Revolutionaries who were not soldiers may have faced death – especially had the British won.
have been of similar ages – see Egnal (1989). After 6 years of war these Revolutionary leaders could quite easily have had only about 15-years or so of expected life remaining. Accordingly, if the acceptable test payback period was set at 15-years, many Revolutionaries would expect to see the first year of positive economic return on their investment in war at just about at the time when they drew their last breath – they would have experienced negative economic returns for all but the last years of their lives. It is arguable therefore that a reasonable test payback period should be less than 15-years, perhaps 10-years would be appropriate but, as we shall see, the exact choice is not critical.

Section IV: Findings

IV.1 Relief from trade burden allowing for expected war costs

We begin with the least complicated scenario, the Revolutionaries considered just relief from trade restrictions and direct war costs – growth rates in income per head during and after the war are set aside for the moment. To be consistent with George Washington’s assessment of the chances of victory at the outset of the War of Independence the probability of victory is set at 1%. Consistent with the literature reviewed in section III the net burden of Empire is set at 1%, and war cost at 5% per annum of colonial income per head. The discount rate is 7.5%. On this estimate, the net economic return on Revolutionary War does not turn positive at any time before 1831, the cutoff point for our

---

9 Egnal (1988) examines on a person by person basis the political activities of “Expansionists” – those very likely to become patriots in the Revolutionary War. For example, in Massachusetts some where “merchant leaders” of non-importation in 1768 or are identified as being engaged in activities at earlier dates. In New York state many Expansionists are identified as being politically active in the 1740-1759 period. In Pennsylvania many Expansionists saw military activity in 1748 or 1755.

10 The test payback period acts rather as do confidence intervals in statistical analysis - they allow a researcher to choose between acceptable and non-acceptable hypotheses.
analysis. Even if the burden was as high as 2% of income per head it is only in 1800 that a positive net benefit is achieved. Had George Washington been motivated only by a desire for greater income per head he would have been sorely disappointed as he died in 1799. Using the 1% burden but lowering the discount rate to 3% allows the net economic return on Revolution to turn positive in 1804 – 29 years after the opening of hostilities (or, 1790 using a high side 2% burden).

The picture is somewhat different if Ransom (1968, page 433) is correct in arguing that 90% of the gross burden of trade restrictions fell on the Southern colonies, and that their gross burden was 2.5% of income per head. With the 7.5% discount rate, the first year of positive return is 1793, 18 years after the outbreak of war; and with the 3% discount rate, five years earlier, in 1788 – a wait of 13 years for a positive economic return on war.

While some Revolutionaries may have been motivated only by the prospect of greater income per head and were prepared to wait 13-years, is has to be asked, if so much of the gross burden of colonial status was concentrated in the South, what were those in the Northern and Middle states fighting for? It is also worth supposing for a moment that if any of the forgoing payback periods were deemed acceptable, what is implied is that those groups that expected eventually to benefit from Independence (the gross beneficiaries) were prepared not only to let other groups (those that benefited economically from Empire membership) go under, but also to heap war cost on the 13-colonies as a whole. Such a scenario of greed would be far from being a glorious beginning for the United States of America.
IV.2. *Expectations of faster income per head growth*

How much difference does bringing in expectations on growth rates of income per head both during the War and after Independence make? The set of parameters is now extended to allow for expectations on economic growth during, soon after and in the long-run after the War of Independence. The maintained hypothesis is that a prospective Revolutionary thinking about future economic growth rates could expect:

a) Negative income per head growth during the period of war as the war would draw resources out of the civilian economy and productive assets would be destroyed, or, as many loyalists did, move abroad;

b) Following cessation of hostilities, income growth would be slow for several years as foreign trade and production reorganized themselves outside of established Empire channels; and

c) Only in the “long-run”, once the economy had righted itself, would higher rates of income growth materialize.

Moreover, had the Revolution not occurred, income per head in the 13-colonies could have continued to grow at its 0.5% per annum average established in the many decades prior to 1775. This growth rate could well have increased as the industrial revolution took its grip in Britain - so widening the market for American goods, as was the case with what soon became America’s main export, cotton.\(^\text{11}\) It is against this steady in-Empire growth rate that changed income per head growth rates post-Revolution should be compared.

Two scenarios are set out in Table 1 the difference between them being the initial probabilities of victory, the burdens of colonial status on income per head and the

\(^\text{11}\) According to Deane and Cole (1967, page 80) the rate of growth of British real gross output and real per capita output accelerated from an average rate of 0.3% p.a. from 1695 to 1765, to 0.9% p.a. to 1805.
discount rates. Expected annual income per head growth rates are as follows – during the war, *minus* 1.0% (amounting to a modest fall of 6% or so over the period of war); income growth rate peace (early) 0.6%; income growth rate peace (later) - after 1799, 1.2% - slightly higher than the estimates by David (1967); and income growth rate still in the Empire, 0.5% per annum.

The parameter values in scenario (1) in Table 1 are well supported in the literature review of section III. Strikingly, the net return on War does not turn positive anytime before our cut off point in 1831.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial probability of victory</td>
<td>1%</td>
<td>20%</td>
</tr>
<tr>
<td>Initial income per head</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Income growth rate (war)</td>
<td><em>Minus</em> 1%</td>
<td><em>Minus</em> 1.0%</td>
</tr>
<tr>
<td>Income growth rate peace (early)</td>
<td>0.6%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Income growth rate peace (later)</td>
<td>1.2%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Income growth rate still in Empire</td>
<td>0.5%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Discount rate</td>
<td>7.5%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Net burden of Empire</td>
<td>1.0%</td>
<td>2.0%</td>
</tr>
<tr>
<td>War-cost rate</td>
<td>5.0%</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

Scenario (2) has been chosen to be more favorable to the economic-causes hypothesis with a higher initial probability of victory, lower discount rate and greater income per head burden of colonial status. Even so, little or no support is lent to the economic-causes hypothesis as the first year of positive economic return is in 1830, 55 years after the American Revolution began. Even with a 0.0% discount rate positive annual returns only begin in 1820. Given life-expectancy in 1775 of about 56-years, no Revolutionary in
1775 considering only the expected increase in income per head could possibly have viewed the Revolution as offering an acceptable payoff.\textsuperscript{12}

**Section V: Willingness to pay for political objectives**

There is useful information in the conclusion that those supporting the American Revolution could not themselves have expected to benefit economically from it except only after a much extended period of time. What then was the main proximate cause for War with the mother country?

**V.1: Estimating willingness to pay to relieve perceived political burdens**

Using our benefit-cost method it is possible to make an estimate of the willingness to pay to relieve political grievances. This is accomplished by asking how large the total burden of Empire membership (equation 4) would have to be to obtain a positive payoff from Independence within a reasonable timeframe.

Table 2 offers two scenarios: scenario (1) which is close to scenario (1) of Table 1, and scenario (2) which uses parameter values more favorable to the economic-causes hypothesis. Thus, under scenario (1) the total burden of Empire membership would have to be 15\% of colonial income per head for the first positive return on investment in Revolution to occur as soon as 10-years. With a supposed 1.0\% economic burden, the remaining 14\% of the total burden (equation 4) must have been made up of the willingness to pay to relieve political grievances. In other words, WTP to relieve political

\textsuperscript{12} Adjusting the growth rate after 1799 upward from 1.2\% per annum to 1.5\% makes hardly any difference as it is not until 1822 that net present value turns positive In fact, raising the discount rate from 3\% to 7.5\% undoes even that small improvement in payback period – NPV does not turn positive until after 1831.
grievances amounted to 14/15ths or 93% of the perceived total burden of colonial status. Even using a 2% economic burden, WTP to relieve political grievances is 13/15ths, or 87% of the total burden.

![Table 2](https://via.placeholder.com/150)

*Parameter values used in two scenarios to ascertain WTP to achieve political objectives*

<table>
<thead>
<tr>
<th>Parameters</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial probability of victory</td>
<td>1.0%</td>
<td>20%</td>
</tr>
<tr>
<td>Initial income per head</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Income growth rate (war)</td>
<td>-1.0%</td>
<td>-1.0%</td>
</tr>
<tr>
<td>Income growth rate peace (early)</td>
<td>0.6%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Income growth rate peace (later)</td>
<td>1.2%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Income growth rate still in Empire</td>
<td>0.5%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Discount rate</td>
<td>7.5%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Lost income due to Empire</td>
<td>15.0%</td>
<td>13.0%</td>
</tr>
<tr>
<td>War-cost rate</td>
<td>5.0%</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

The parameter values of scenario (2) in the Table 2 are more favorable to the economic causes hypothesis as the initial probability of victory is set higher and discount rate lower. In this case the minimum value of equation (4) needed to yield a net positive return on Revolution in 10-years falls to 13%. Now WTP to relieve political grievances is 12/13ths or 11/13ths of the perceived total burden of colonial status depending on whether the economic burden was, respectively, 1% or 2% of income per head.

What these calculations suggest is that by the far largest component of the perceived total burden of colonial status was willingness to pay for the attainment of political objectives; and nor is this conclusion sensitive to the discount rate.\(^{13}\)

\(^{13}\) Even with a 0.0% discount rate the minimum total burden need to meet the 10-year test payback period under scenario (2) falls only to 11.3%. Given an economic burden of 2% willingness to pay to remove the political burden would still be 9.3/11.3 = 82% of the total burden.
V.2 Increasing the test-payback period from 10- to 20-years

Suppose that a potential Revolutionary was prepared to wait 20-years for a positive net return on investment in War instead of the previously assumed 10-year payback period. Then, using scenario (2) of Table 2 the total burden (equation 4) would fall to 8% of colonial income per head. But even given a 2% economic burden, WTP to relieve political grievances would still constitute 75% of the perceived total burden of colonial status.

V.3 Benefit shifting toward and war cost shifting away from patriots

If there was substantial war-cost shifting away from the Revolutionary group, so that on average they suffered only a 2% war-cost instead of the colonial average 5%, the hypothetical total burden falls further to 10% of income per head - using the 10-year test pay back period. If there was also benefit shifting toward the Revolutionary group, so that they expected their real incomes to increase by 5% instead of the colonial average 2%, then the willingness to pay to settle political objectives is 5/10 = 50%. Even on this scenario, there is again a very substantial role for political factors in provoking the American Revolution.

Section VI: Conclusions

The main conclusion is that political factors easily predominated as causes of the American War of Independence and that the desire for increased income per head outside of the British Empire was of relatively minor importance. This accords well with the
judgment of the contemporary historian Ramsay (1789) and the later authority Bailyn (1992).

As revealed in the several scenarios that have been investigated, war costs play a crucial role in driving this conclusion. Any reasonable expectation of economic benefits post-Independence could not have been great enough to justify incurring the initial costs of War. For economic motives to have predominated the Revolutionaries would have had to be unreasonable dreamers about how high post-Independence rates of economic growth could become – an assertion that does not depend on choice of discount rate or assumed informed initial probabilities of victory.

Conceivably, war cost shifting away from and economic benefit shifting toward the Revolutionary group – about one-third of the free colonial population, could create a more even balance between the weight of political and economic motives. The extent of these two shifts could be a focus for future research, but it should be noted that as far as this author knows, historians have not argued that such shifting was considerably large as it would have to be to make much difference to the main conclusion of this paper.
References
Bullock, C.J. (1895), *The Finance of the United States from 1775 to 1789*, University of Wisconsin, Madison.
http://digitalcommons.uconn.edu/econ_wpapers/200908


