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Abstract

We offer an analysis of the American Revolution in which actors are modeled as choosing the sovereign organization that maximizes their net expected benefits. Benefits of secession derive from satisfaction of greed and settlement of grievance. Costs derive from the cost of civil war and lost benefit of Empire membership. When expected net benefits are positive for both secessionists and the Empire civil war ensues, otherwise it is settled or never begins in the first place. The novelty of our discussion is to show how diverse economic and non-economic factors (such as pamphleteering by Thomas Paine and the morale of the Revolutionary forces) can be integrated into a single economic model.

1: Introduction

A fair assessment of the extensive research on the causes of the American Revolution is that greed and grievance were elemental. With respect to the former, economic historians estimate that the gain to be had from secession from the British Empire was about one to two percent of income per annum.[1] Grievance was also a motivating force – especially American grievances against the raft of badly judged Parliamentary legislation after 1763.

Economic benefit and grievance can be treated similarly as encompassing the expected *gross* benefit of secession.[2] However, while greed, grievance, or, a combination was necessary for the American Revolution, they were not sufficient. Another important factor must have been the expected cost of a fighting a secessionist war, as well as the secessionists' confidence in victory – their subjective probability of a successful prosecution of the war against the mother country. With a low probability of success, support for war would surely have melted away; while an increasing probability would draw more supporters to the cause. We will discuss how we think historical events impacted the probability of secession on the part of both the colonists and the mother country. We will also argue that the expected (probability weighted) benefit of secession

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[1] Economic historians estimating the economic benefits include Egnal and Ernst (1972), Harper (1942), McClelland (1969 and 1973), Ransom (1968), Reid (1978), Thomas (1965), Walton (1971).
[2] There are well known theoretical methods – willingness to pay and willingness to accept - of placing monetary values on non-market variables – not that we will attempt any such calculations here.

would rationally be compared with the cost of attaining that benefit – in other words, the cost of disputing secession with the British. And, of course, this dispute cost would also have depended upon how hard the Empire pushed back. The latter itself depending upon complex calculations, such as the value of the American colonies to the Empire, the probability of defeating the secessionists, and the cost of persuading them to change their minds. We will argue that calculations on variables such as the foregoing as well as others, and as expressed in the 'equations of secession' set out in the next section, almost certainly fluctuated during the six years of Revolutionary war. Indeed, using the terminology set out below, round about 1750 'tranquility' reigned between the mother country and its American colonies, tipped into civil war in 1775 (at Lexington), and at the end of the struggle tipped again into a secession in 1783 with the Treaty of Paris.

In what follows we do not offer new historical 'facts', rather our endeavor is to reinterpret known 'facts' in terms of the economic model of historical sequences set out in Hallwood (2007). This economic modeling is based on the following notions. Decisions taken by non-state actors to fight wars of secession are treated as a non-market investment choice that can be subjected to benefit-cost analysis.[3] Benefits take the form of the expected return on independence, and this has to be compared with dispute costs in cases where a prospective secession is resisted by the union. Likewise, the union has to

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[3] Using rational choice theory to model non-state actor behavior is not new as many analyses of treaty formation attest – see, for example, Barrett (2003), Goldsmith and Posner (2005) and Keohane (2005). Extending rational choice theory to sub-national decision-makers is a logical extension and has been addressed by, for example, Collier and Hoeffer (2000), Collier and Sambanis (2005), and Grossman (1999). In the former paper, sub-national decision-makers are warlords and their followers who expect to gain financially from secession. In that model wider national, societal, cultural, religious or ethnic grievances are of secondary concern. However, as Marshall and Gurr (2005) and Ballentine and Sherman (2003) show, frequently these latter factors are motivational. Young (2002) advances the argument that both economic (or, 'material') factors and political factors enter into a secessionist's utility function, but that economic factors predominate in peaceful secessions.

compare benefits and costs of resisting secession. As shown in Hallwood (2007) the

underlying model yields a set of historically stable equilibriums and one of transitional,

or, temporary, equilibrium. Movement between these equilibriums yields a rich dynamic

of historical sequences. In this paper we set the model against the facts of the American

Revolution and, we think, turn up new insights. Indeed, the 'equations of secession' are

quite general in that they can be applied to any war of secession, including the American

Civil War and the many ongoing wars of secession in the world today.[4]

Thus, using this methodology, we are able to integrate various historical events into a

general economic model. Events such as the ebb and flow of battle and the

pamphleteering of people such as Thomas Paine are readily understood within the model.

We readily admit that we gloss over myriad details turned up by historians. However, as

long as one accepts the notion that the secessionists and the Empire were rational

calculators (probably implicitly and with imperfect information) of their net interests in

promoting or opposing secession we are confident that overlooked facts will not

invalidate our conceptualization of the historical episode under investigation.

The rest of the paper proceeds as follows. Section 2 describes the economic model;

section 3 discusses historical events in terms of the model; and section 4 draws

conclusions.

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[4] For a listing of ongoing wars of secession see Marshall and Gurr (2005).

2: Equations of secession

A simplified union

Imagine a "union" – a sovereign of two or more sub-regions. It could be a voluntary union of countries, or it could be an empire (defined as a union where membership of at least one sub-region is not entirely voluntary). The inhabitants of the different regions in the union see themselves as different from one another. The differences arise from their different histories stemming from many possible sources - different languages, religions, race, social, legal, and economic institutions, and cultures. In figure 1 the union X has three sub-regions A, B and C. Such a union in the mid-eighteenth century was Great Britain, its 13 American colonies and Canada.

The union X

Region B	
Region A	Region C
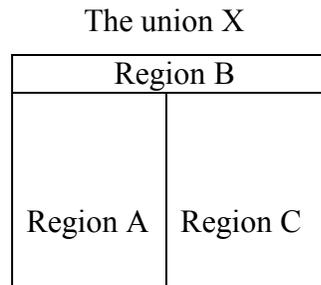
Figure 1: A union composed of three regions

A sub-region will rationally wish to secede from the union X if expected benefits from gaining independence exceed the cost of creating its own sovereignty.

What exactly the benefits of sovereignty are thought to be is likely to vary from case to case. We examine the secession of the 13 colonies in section 3. The supposed benefits are held in the minds of 'nationalists'[5] – meaning those people who identify themselves with

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[5] Or, "expansionists" to use the terminology of Egnal (1988).

a region rather than with the union as a whole. We define these benefits as the 'economic rent of sovereignty'. "Economic rent" is perhaps not the best term that could be used but it does indicate a surplus enjoyed by some group, in its original usage by owners of land, which is apposite in the current context.

We assume that a union's and one or more of its sub-region's interests are synonymous with the interests of the respective political leaderships.[6] A political leadership may attempt to identify its interests with the interests of the wider citizenry that it weighs in some way. The less democratic is a country or sub-region the greater is likely to be the gap between the interests of the political leadership and those of the rest of the citizens.[7]

A secessionist's maximization problem

The expected benefit at time, t, for a secessionist group – in region B for arguments sake, of breaking away from a union is:

(1) $$E(economic.rentB) = \sum_{t=1}^{T} (\frac{(pr_t(\$rent)_t}{(1+r)^t} + \frac{(1-pr)_t\$x_t}{(1+r)^t})$$

Where *E(economic rent B)* is the expected present value of economic rent with independence less any economic rent that would have been available had B remained in the union; pr_t is the subjective probability of gaining sovereignty in any given year $t = 1...T$; therefore, (1 - pr_t) is the probability of not having gained sovereignty in year t; *r* is

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[6] Here we follow Goldsmith and Posner (2005). The context of the 13 colonies historians have identified the political leaders as being drawn from an 'elite' of wealthy merchants and plantation owners.
[7] On this see Alesina and Spolaore (2003).

the decision-makers' weighted average rate of time preference[8]; $rent is the annual rent that would be earned if sovereignty was won. This value is expressed in monetary terms but it could also be written in terms of utility; $x is economic rent if B does not gain sovereignty, so remaining in the union.

The numerical value of the terms in equation (1) may change over time. The probability of winning sovereign rights, pr_t, changes with circumstances – for example, if the commitment of the representatives of the union X to sustaining the union is thought to have weakened, pr_t may increase. The rate of time preference, r, may change if, for various reasons, secession is thought to have become more or less urgent in the minds of decision-makers. And annual economic rents under the different regimes, respectively, $rent_t$ and x_t, may change.

If separation is not agreed with the union, nationalists in region B may continue to press for secession. But there is a cost of maintaining a dispute.[9] The expected discounted present value of dispute cost is:

$$(2) \qquad E(dispute.\cos t) = \sum_{t=1}^{T} (\frac{(1-pr)_t (\$dispute\cos t)_t}{(1+r)^t})$$

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[8] There is no need here to take sides on whether or not decision-makers apply a constant rate of discount across relevant future time periods. For a discussion of choice of discount rate in an international relations context see Streich and Levy (2007).
[9] Secession is a legal step in international law but transaction cost is incurred in getting to make this step. The latter observation differentiates our work from that of Alesina and Spolaore (2003) on the optimal number of countries - as they implicitly assume a frictionless world. Indeed, transaction costs are endogenous to historical sequences with either side in a secessionist dispute attempting to minimize its own while increasing those of the adversary.

Where $(1 - pr)_t$ is again the subjective probability of not having sovereignty in any given year, t, in which case an annual dispute cost is incurred. These costs may be low – just the cost of a negotiating team. But they could be substantial – as when military conflict breaks out.

The *net* advantage to B of continuing a secessionist dispute is:

(3)   *E(net economic rent)$_B$ = E(economic rent B) – E(dispute cost)*

Or,

(4)   *E(NER)$_B$ = (equation 1) – (equation 2).*

B has to choose between pursuing sovereignty, or, remaining as a part of the union. This depends, respectively, upon whether E(NER)$_B$ is positive or negative.

The union's maximization problem

The government of the union X has a different set of calculations to make. It has to consider the return it gets from retaining B in the union in comparison with the cost of persuading B to remain a part of it. At time t, X's expected economic rent derived from retaining B in the union is:

(5) $E(economic.rentX) = \sum_{t=1}^{J} (\frac{(1 - Pr_t)(\$RENT)_t}{(1+i)^t} + \frac{Pr_t \$y_t}{(1+i)^t})$

Where Pr$_t$ is X's subjective probability of B seceding (and may be different from pr$_t$ which is B's subjective probability of secession). ($RENT)$_t$ is economic rent earned by X with B in the union, and y_t$ is the economic rent that it may earn if B secedes. Finally, *i*

is X's rate of time preference. It is reasonable to assume that ($RENT)$_t$ is greater than

y_t, perhaps substantially so, as with B in the union the union can tax resource rents in B, while it cannot do so once B has seceded.

X incurs a cost of persuading B to remain within the union. Persuasion cost could be the extra subsidies, possibly in the form of reduced taxes, given by the union to B in an effort to make remaining in the union favorable for B. Also included in persuasion cost is military expenditure by the union – such as the stationing troops in B - as is typical of imperial powers.

Persuasion cost is:

$$(6) \qquad E(persuasion\cos t) = \sum_{t=1}^{J} (\frac{(1-\Pr)_t(\$persuasion\cos t)_t}{(1+i)^t})$$

From X's point of view, the net benefit, E(NER)$_X$, of B remaining in the union is equation (5) minus equation (6), viz:

$$(7) \qquad E(NER)_X = (equation\ 5) - (equation\ 6)$$

E(NER)$_X$ is used in the analysis of whether X will agree to secession and sovereignty for B. Which it will do if E(NER)$_X$ is negative – secession occurs; or, whether secession will be resisted - E(NER)$_X$ is positive.

The payoffs in figure 2 for the two pairs of strategies are the present value of expected *net* economic rents, $E(NER)_B$ and *E(NER)$_X$*. The payoffs in the lower left of each box are those for the union, X, and those in the upper right those sub-region B.

	SUB-REGION B	
	Secession Preferred	Prefer Union with X
Secession Resisted	$E(NER)_B > 0$ **War of secession** $E(NER)_X > 0$	$E(NER)_B < 0$ **Empire** $E(NER)_X > 0$
Secession Not resisted	$E(NER)_B > 0$ **Non-resisted sécession** $E(NER)_X < 0$	$E(NER)_B < 0$ **Tranquility** $E(NER)_X < 0$

(with **UNION X** labeling the rows)

Figure 2: To secede or not to secede?

The four boxes in figure 2 define four historical phases: a tranquil union, a stable empire, a war of secession and a non-resisted secession. Thus,

1) In the southeast box the net reward for pressing for secession is negative for sub-national unit B, and in any event union X would not resist as its persuasion cost of retaining B in the union is greater than the benefit of doing so. Both B and X prefer continuation of the union. Tranquility reigns.[10]

2) In the northeast box expected net economic rent is positive for the union but negative for B. This is the case of stable empire. B, with negative $E(NER)_B$, does

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[10] Forms of government found in each box include tranquility in a unitary state – a state with a central government with power devolved downward but answerable to it; federal states such as the USA and Germany; a commonwealth of largely independent states (as with the British Commonwealth); and in earlier times, intermarriage between kingdoms aimed at sealing alliances.

not have sufficient motivation to try to secede, and X, with $E(NER)_X > 0$, would resist secession if B were to demand to do so.

3) The northwest box has $E(NER)_B$ and $E(NER)_X > 0$ for both parties. This is the case of a 'war of secession'. Region B has the motivation to secede and X has the motivation to resist.[11]

4) The southwest box shows the case of peaceful, or, non-resisted, secession as region B desires to secede ($E(NER)_B$ is positive) and X has no desire to resist secession ($E(NER)_X$ being negative). Secessions in democratic countries are likely to be of this kind.[12]

Both tranquility and empire can be thought of as historical equilibriums in the sense that they may persist for a long time. War of secession is a transitional phase. Even so, empires do not last forever, nor must tranquility, and wars of secession can last for generations.

Drivers of historical sequences

The argument above is that historical sequences are driven by combination of expected net economic rents between sub-national unit B and union X of which B is a part. There are 6 terms in equations (1) and (2) all relating to region B; and another 6 in equations (5) and (6) relating to the union X. These are summarized in Table 1.

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[11] Walter (2001) notes that between 1940 and 1996 there were 72 civil wars and that in a large number of these conflict was over the division of territory. Secessionist war may be aimed by B at having greater access to state power – what Gurr (2000) calls 'ethnic rebellion', or they may be wars of self-determination – creation of an independent state – as with the American Revolution.

[12] And they are the sole type (implicitly) discussed in Alesina and Spolaore (2003).

TABLE 1: FUNDAMENTAL DRIVERS OF HISTORICAL SEQUENCES

Elements in the calculation of Region B's expected net economic rent: E(NER)$_B$	*Elements in the calculation of union X's expected net economic rent: E(NER)$_X$*
1. *($dispute cost)$_t$* : B's cost of disputing sovereignty with the union in period t	1. *($persuasion cost)$_t$* : the union's cost of persuading B to remain in the union at time t
2. *($rent)$_t$* : return to B with independence in period t	2. *($RENT)$_t$* : X's return with B in the union in period t
3. *pr_t:* B's subjective probability of secession in period t. Or, *(1 - pr$_t$)$_t$* : B's subjective probability of secession not occurring in period t	3. *Pr_t* :the union's subjective probability of B seceding in period t. Or, *(1 – Pr)$_t$* : union's subjective probability of B not seceding in period t
4. *r* : B's rate of time preference	4. *i* : union's rate of time preference
5. *x_t* : return to B it if remains in the union in period t	5. *y_t* : return to X if B leaves the union in period t
6. T: B's forward looking time scale	6. J: X's forward looking time scale

We turn now to a justification of the forgoing economic model by applying it to the American Revolution. We will explain how various historical events apply to the variables listed in the preceding equations and in Table 1. It will be shown how the signs and relative balance of the equations shifted over time - until war became inevitable; and then how during the course of the war the equations shifted again leading to a state of peace and a new stable equilibrium.

Section 3: The American Revolution

The American Revolution and the events leading up to it is, to say the least, complex with historians offering several different schools of thought.[13] Here we discuss what we think are the major causal events. The British Empire will be the Union X, and the 13 American colonies Region B – a sub-part of the Empire.

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[13] For brief summaries of these see Egnal and Ernst (1972) and Egnal (1988).

Circa-1750: stable empire

We begin in a state of stable Empire, about 1750 – a historical equilibrium in the northeast box of Figure 2. Britain controls the American colonies and most colonists want to remain British. There were many reasons for this relationship of empire to be stable; we mention only a few. The colonists liked being part of the Empire and the British liked having the colonies. The probability of secession, pr_t, was therefore low, since no political movement of any consequence was considering it – though see Egnal (1988) on the spreading influence on the 'expansionist' faction that saw America better off outside of the Empire. Secondly, dispute cost, *($dispute cost)$_t$*, was high, and persuasion cost, *($persuasion cost)$_t$*, low since, at the time, Britain had a powerful army and navy, and the colonists had no standing military force of their own. Thirdly, the Empire protected the colonists from encroachment by the French. Fourthly, the colonists benefit from access to Empire markets. These features kept the return from remaining in the Empire, *$x*, high and the expected return from leaving it, *($rent)$_t$*, low for the Americans. It also meant that the return to the Empire from retaining the American colonies, *($RENT)$_t$*, was high relative to the return that could be expected following secession, *y_t*. Accordingly, the colonist's net economic rent, $E(NER)_B$, was negative; the benefits of staying in the Empire far outweighed any cost of trying to break free. The Empire enjoyed positive economic rent, $E(NER)_X$, because it was a great benefit to have the colonies and the cost of keeping them was not excessive.

Economic factors in secession – a brief examination

Several economic factors are identified by Egnal and Ernst (1972) as causal: increasing real debt burdens in the post-1763 recession, interference by Parliament in the colonies' monetary arrangements, and penetration by British merchants in both the northern and southern colonies in markets hitherto the preserve of colonial merchants and planters. As they say: "The consciousness of a clash of interests made the merchants more aware of the identity of economic and political goals" (p 58). In terms of our model secession was expected to increase *($rent)$_t$*. However, they offer little or no explicit consideration of the other variables in our model. The Parliamentary legislation that some historians have stressed as having been an important cause of the revolution is rather set aside. This may well be true as far as the magnitude of their effect on *($rent)$_t$* is concerned, and especially as various Acts were quickly repealed by Parliament.[14] However, our interpretation is that the Acts did have important effects, but acting through the probability of secession, pr_t, rather than *($rent)$_t$*. Indeed, Egnal and Ernst (1972) say of the 'objectionable' Parliamentary Acts that they "strengthened commitment to economic autonomy" (p 60). If 'commitment' translates into greater willingness to sacrifice for victory, pr_t, had increased.

Initial events leading to Revolution: the French and Indian war

The first major event to be considered is the French and Indian War 1754-1763.[15]

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[14] Indeed, even the Navigation Acts, in place from 1651 until the Revolution, are calculated by Thomas (1965) to have reduced per capita income in the American colonies by less than one percent once the benefit of British military protection is factored in. Moreover, after the defeat of the French in North America, it can be argued that this military protection was no longer needed. In that case, the per capita cost of the Navigation Acts on the colonists rises to only about two percent.

[15] Or Seven Years War fought between the British and the French and their Indian allies,

The victorious British chose to tax the colonies to offset their increased indebtedness incurred in the war, so laying the groundwork for many of the conflicts between the British and the American colonies (Rothbard, 1976, page 27-28).

On the British side of the equation the French and Indian War had several consequences. The Empire had just spent treasure defending the colonies and had gained productive territory in the process. In terms of equation (5) economic rent, $(\$RENT)_t$, gained from the colonies had increased. The colonies were also a future source of taxes.

On the colonist side three factors need to be considered - the first two favoring secession, the third working in the opposite direction. The return from remaining in the union, $\$x_t$, may have diminished since the possibility of further conflict with the French had decreased; and something that would be very important in the future was a reduction in the colonist's dispute cost, $(\$dispute\ cost)_t$, because the recent war had generated experience of fighting wars.[16] However, the return for the colonists outside of the union, $(\$rent)_t$, probably diminished since the Empire had expanded offering the Americans greater trading opportunities within the union rather than outside of it. It is our judgment, at least as far as the mid-1760s are concerned, that the effect on the probability of secession in the eyes of the colonists, pr_t, had changed little, remaining negligible.

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[16] Indeed, George Washington himself was at the first battle of the French and Indian war and participated throughout (Middlekauff, 2005, 58).

Parliamentary Acts and the growth of self-consciousness

The next major series of events to effect the equations were a series of Acts imposed upon the colonists by the British Parliament. The most important of these were the Stamp Act, 1765, the Quartering Act, 1765, the Townshend Acts, 1767, the Tea Act, 1773, and the Intolerable Acts, 1774. Parliament passed the Stamp Act in order to help reduce debts incurred during the war.[17] As the colonists had carried much of the burden of fighting, at least in North America, it seemed unfair to them that they should also have to pay for it (Thomas, 1965, 89-97, Middlekauff, 2005, 88).

The colonial reaction to the Stamp Act was staggering. The colonists, especially the business class, were enraged. They saw no reason to have to pay for services that had always been free. While it was claimed that the Stamp Act hindered commerce, the bigger issue was that according to British law no one could be taxed without a representative in Parliament, and the colonists were not directly represented in Parliament.[18] Thus, the phrase "no taxation without representation". There were riots in the streets, and tax collectors were hunted down. The *Sons of Liberty* protested the Act, often violently (Middlekauff, 2005, page. 94).

It is our argument that the Stamp Act crisis, in drawing Americans together, had created among them a deeper sense of a common identity. In terms of our historical model this increased the return – as they saw it, on separating themselves from the union. That is,

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[17] The Stamp Act imposed on every newspaper, pamphlet, and other newly issued public and legal documents a tax in the form of the necessity to buy a stamp.

[18] There were British delegates that stood in for the colonies, but no one from the colonies themselves was there.

($rent)$_t – the return to the colonists given independence, had increased from a negligible level, though in 1765 it was probably still rather small. We will point to other factors that increased this sense of an American identity, especially the tracts of Thomas Paine and letters of John Dickinson. It is also worth emphasizing that we are arguing that the creation of a common identity must precede revolution – something that Egnal (1988) implicitly describes in a lot of detail.

 In response to the Stamp Act crisis, the British stationed extra troops in the northeastern colonies further enraging the colonists and for two reasons. Under the Quartering Act (1765), the colonists had to support and pay for the troops to be there, which was seen as an unfair financial strain. Secondly, the colonists had a traditional fear of standing armies, believing that standing armies lead to the enforcement of unfair laws and abuses of freedom (Middlekauff, 2005, 97). Resistance to the Stamp and Quartering Acts increased leading to the *Stamp Act Congress* of October 1765. For the first time the American colonists united against what they saw as unjust policy. The Congress met to petition the King and plead the colony's case against the Acts. It also imposed a ban on the importation of British goods, hoping to pressure Parliament into repealing the Acts. Eventually the Stamp Act was repealed, but tensions worsened when, soon after, Parliament passed the Declaratory Act. This declared that Parliament could pass and enforce any Act or law it saw fit on the colonies. The colonists were made to feel that they were being scolded with the result that mistrust of Britain deepened (Rothbard, 1976, 151, and Middlekauff, 2005, 111).

The Stamp Act crisis, and the Quartering and Declaratory Acts affected equation (1) in several ways. On the colonist's side, as we have said, it raised *($rent)*$_t$ and lowered *$x*$_t$ since secession would mean elimination of tax transfers to Britain as well as not having to pay for quartering British troops. Secondly, the probability of secession as viewed by the colonists, *pr*$_t$, probably increased a little as the benefits of secession became apparent. Moreover, during this crisis, it can be argued, that impatience with British policy increased – which would be reflected in a rise in the rate of time preference, *r*. The importance of the latter is that it reduces the present value of the stream of expected future benefits (which, without secession, trail off into the distant future) relative to the present value of dispute costs, with the latter expected to be incurred only in the short term.

The colonist's dispute costs had probably fallen somewhat as they had for the first time organized themselves as a counter to the union. This was of great importance because it demonstrated that in cooperating the colonists could muster effective power. However, in the late-1760s there was still no meaningful talk of a war of secession – in our view mainly because dispute cost, especially military costs, remained high. At this point the colonists were willing only to petition and protest, albeit sometimes with riots.

On Britain's side, the rents to be extracted from the American colonies, *($RENT)*$_t$, had increased, since taxing the colonies was thought to be an option. Persuasion costs, *($persuasion cost)*$_t$, though had increased slightly because of the extra troops needed to quell the riots. However, these were seen as almost insignificant, especially as the

Quartering Act was designed to transfer this cost to the colonists themselves. The

probably of secession as viewed by Britain, Pr_t, must have remained low - there is no

conception of having to fight an all-out war of secession.

Our judgments is that immediately after the Stamp Act crisis in 1765 the colonists' net

economic rent from secession, equation (3), remained negative – the benefits of secession

were still viewed as being substantially less than that the dispute costs that would be

incurred. However, a beginning had been made on changing its sign from negative to

positive – there was a lasting bitterness on the part of the colonists. The Stamp Act crisis

also created a great deal of mistrust and distance between Parliament and the 13

colonies.[19]

Townshend and Tea Acts: deepening of grievance and self-consciousness

Animosity deepened a year later with the passing of the Townshend Acts.[20] The

colonists' reaction was much the same as with the Stamp Act - though with more

weariness than resentment as they were drained from fighting the Stamp Act.[21] However,

in Boston, rioting and harassment of customs commissioners and tax collectors persisted.

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[19] Since most of the variables in the equations are subjective and influenced a great deal by people's nationalism, beliefs and feelings, it is very important to keep these things in mind when considering how our equations fit into history. The colonist felt that since they were geographically so far away, that the Parliament could not know what life was like in the colonies, or what the colonists' needs or wants were. They also felt that it was unfair for a government thousands of miles away to enforce policies without proper representation. Parliament on the other hand, saw no reason why the American colonies should not be treated like any other part of the union – passing whatever laws and taxes it chose.

[20] These included taxes on glass, lead, paints, paper, and tea.

[21] One response was John Dickinson's *Letters from a Farmer in Pennsylvania*, which were published in all but four colonial newspapers, in several pamphlets, and in London and Paris. The letters stated that the Townshend Acts were an encroachment on the constitutional right of Americans, exactly as with the Stamp Act. It also encouraged petitioning of the Crown for repeal, and continued boycotting of British goods. These words were taking to heart by the colonists (Rothbard, 1976, 166-170, Middlekauff, 2005, 166).

The Sons of Liberty continued to be active, and tensions deepened throughout the colonies. A prime example is the Boston Massacre of 1770, where British troops fired onto an unruly crowd, killing five persons. The colonists were outraged, and the massacre confirmed their mistrust of Britain. Eventually all of the Townshend Acts were repealed excepting the tea tax (Middlekauff, 2005, 169).

The Tea Act of 1773 was meant to help the British East India Tea company by allowing the shipping of tea directly to the 13 colonies rather than having to pass through British ports. This Act did not incur any extra expenses for the colonists but, in the shadow of the Townshend Acts, the colonists took offense (Middlekauff, 2005, 225). Moreover the local tea merchants saw a loss of trade for themselves. The colonists saw the matter as a malicious Parliament trying once again unjustly to assert its will and control. The Sons of Liberty went into action through protests and newspaper articles. Mass meetings were held to discuss the situation. In Philadelphia and New York the Sons of Liberty and their supporters stopped the tea ships from landing their cargos. In Boston, the ships were refused the right to unload their tea. Eventually the Sons of Liberty performed what is known as the Boston Tea Party dumping all the tea into harbor. The British Parliament was inflamed by this insubordination – seeing the colonies becoming more unruly, and coming to fear that they would cease to be a profitable part of the union (Middlekauff, 2005, 233).

These latter Acts affected equation (3) in much the same way as did the Stamp Act, though with greater effect. More people felt their rights were being infringed, and that

the cycle of Parliament continuing to be abusive would continue. The British felt that the

colonies would continue to challenging the will of the Empire. As all this goes on

impatience on both sides increased, shortening *T* and *J:* or, at least it did for actors

thinking that the political situation would soon come to a head. As violence and riots

continued, dispute cost continued to fall as the colonists learnt about revolutionary

techniques. Persuasion costs continued to rise as the colonists' resolve deepened. There

is a vicious circle – the more the union pressured the colonies, the more the 13 colonies

felt threatened and needed to fight back. In the probability of secession, pr_t, continued to

rise; although we do not yet see it close to being large enough to turn the *net* economic

rent of secession, $E(NER)_B$, positive. The *net* return to the union, $E(NER)_X$, from the 13

colonies remains positive but is falling as the colonies are no longer an easy and sure way

to gain tax revenues. In conjunction $\$x_t$, the return to the colonies of remaining in the

union, was falling since the colonies are producing increasing amounts of their own

goods under the boycott of British goods. As time passes, incremental increases in the

value of equation (3), together with still positive values of equation (7), are slowly

moving the union and its region B in figure 2 to civil war - out of the stable equilibrium

in the northeast quadrant into the unstable historical episode in the northwest quadrant.

The final series of Acts

In response to the Boston Tea Party, Parliament passed a final series of Acts known in the

colonies as the *Intolerable Acts* of 1774. In Intolerable Acts included the *Impartial*

Administration of Justice Act, which moved all Massachusetts trials to other colonies or

to England to keep them "impartial"; the *Massachusetts Bay Regulating Act*, which made

all town meetings not approved by the Royal Governor illegal, and made it that law officials had to be appointed by the Royal Governor. There was also the *Boston Port Act*, which closed Boston's port until the cost of the lost tea was repaid and it moved the capital to Salem. There was a new *Quartering Act*, which allowed British troops to stay in people's homes and open buildings if no barracks were available[22] (Rothbard, 1976, 279, Middlekauff, 2005, 235). All of these Acts were intended to subdue the colonies, especially Massachusetts. Additionally, more troops were sent and fortifications in Boston were strengthened. These Acts were felt to be very harsh by the colonists. Closing of Boston's port would cost not only Bostonians, but also many other colonists substantial income. The forbidding of public meetings was seen as a threat to personal liberty - a taking away of human rights and the *Quartering Act* as an invasion of privacy (Middlekauff, 2005, page 266).

 For many colonists, these Acts were the "last straw" thinking that their natural rights and their rights as British citizens were being taken away. In Boston there were more riots. Mobs closed the courts, and even more (now illegal) meetings were held. Moreover, it was clear in every colony that whatever Parliament could do to Boston it could do to them.

Grievance institutionalized

The *First Continental Congress* was called by the colonists to meet in Philadelphia in September 1774. The main issues were the violation of rights and no taxation without

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[22] There was the *Quebec Act* that gave civil government and religious freedom to Catholics in Quebec. This proved to be salt in the wounds for the American colonists since they too wanted but had not been granted such freedoms.

representation. Trade to and from Britain was stopped. Each colony established a governing committee that held meetings, raised money for arms and militia, and coordinated with the other colonies (Middlekauff, 2005, 249 and 271).

The *Suffolk Resolves* were sent to the King and Parliament stating the colonies' hatred of the "murderous" *Intolerable Acts*. It stated that these Acts were unconstitutional, that Boston would pay no taxes, and all trade to Britain would be stopped until the Acts were repealed. This was the last attempt by the colonies to try to negotiate - although many felt it was a useless. However, most colonists still saw themselves as being British citizens, and there was no talk of independence yet (Middlekauff, 2005, 250-252).

The empire strikes back

When Parliament learnt of the colonist' response against the *Intolerable Acts*, they decided to react with force. It declared the colonies to be in rebellion. Orders were given to the Governor of Massachusetts to use force to arrest the leaders of the Congress and to stop the militia by capturing its arms and supplies.

The stage was set for the *Battle of Lexington and Concord*. When the colonial spies heard that the British would move on Concord they called up the militia and set watch to see when and how the British would come.[23] When the British troops met April 5th, 1775, with the waiting militia in Lexington, the long-standing tension in the colonies

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[23] When the troops were dispatched April 4th 1775, two lanterns were hung in the Old North Church in Boston to signal that the British would come by sea. Paul Revere and others made their famous ride to warn the militias to get ready, and for the congressional representatives to escape.

snapped. The colonies and the British engaged in battle all the way to Concord and back to Boston (Middlekauff, 2005, 272-6).

Civil war - prologue

This was the first point in time when equation (3), net economic rent for the colonies, $E(NER)_B$, tipped into being negative. With net economic rent for the union remaining positive for now the stage was set for civil war. The system had moved from the stable equilibrium in the northeast of figure 2 into the unstable equilibrium in the northwest quadrant. The *Intolerable Acts* had pushed the colonists' resentment over this tipping point. The colonists were now thinking in the short term: life cannot go on as it is. *T* had shortened, and what otherwise would have been a long series of positive economic rents from remaining in the union (theoretically out to infinity) was severely truncated.

Moreover, there was an increase in the colonist's rate of time preference as their impatience had increased. The correspondingly higher value of *r* discounted the expected rents from remaining in the union, $\$x_t$, into smaller values than formerly. Interestingly, the closing of the port of Boston would have had an affect opposite to what Parliament must have expected - because the return from remaining in the union, $\$x_t$, had fallen.

The forgoing events had almost certainly increased the probability of secession, pr_t, probably quite markedly. The net affect of these events was, therefore, to increase net economic rent of secession, $E(NER)_B$. The return from remaining in the union was also adversely affect by the loss of the rights to local trials and freedom to hold meetings. The

colonist's dispute costs had also suddenly subjectively dropped since there was a markedly higher degree of cohesion among them; they had created action committees, armed militias, and they had trained militarily together.

In the meantime the British remained committed to maintaining the union. However, in 1775 there might have been an awareness that the union's persuasion cost had increased owing to the incipient organization of resistance by the colonists. Moreover, the return from retaining the 13 colonies, $(\$RENT)_X$ may have been perceived as having fallen – the Quartering Act was of course an attempt to shift some of the costs of empire onto the colonists.

It is important to note that despite the events leading up to the war, persuasion cost even in 1775 or 1776 for Britain was still low, because it had a large well trained, and technologically advanced army and navy. Britain was also financially capable of fighting a war, and it could afford to hire mercenaries.[24] At the start of the Revolutionary war, Parliament was eager to reassert its dominance. It was weary of petitions and the unruly colonists.   It believed the fight would be short and easy.

A drawback however was that Britain had to move its troops across the Atlantic – a factor in persuasion cost. However, since the Royal Navy 'ruled the waves', even this was not so great a great cost to subdue those that had 'waived the rules'. In order further to reduce persuasion cost, the British enlisted the help of Native Americans and offered freedom to any slaves who would join the cause.

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[24] Such as the German Hessians.

The colonist's dispute costs were still high since they have no standing army and the militias were still far from being well organized. Moreover, once they got an army most of it was untrained, undisciplined and inexperienced. They also had very little by way of supplies including weapons, clothing, shoes, food, and other necessities. They lost several battles - such as Bunker Hill, mainly because they had run out of ammunition. They had no navy, having always relied on the Royal Navy. Nor was there an effective supreme ruling body capable of raising taxes for the war effort. This came only gradually beginning in May 1775 with the first meeting of the *Second Continental Congress*; and even then, each of the thirteen colonies was not mandated to support the war. Finances were therefore thin to nonexistent. Troops went unpaid for years - from the lowliest recruit up to George Washington himself.

However, the colonists had some advantages. One was that they were fighting on home ground; they knew the terrain well, and had a tactical advantage. They could also obtain supplies from nearby towns and farms. They were also in some large part woodsmen and sharpshooters. Nor for the most part did they play by normal rules of war - which confused the British and make it hard for them to fight. Most importantly, they were full of patriotic zeal, defending their homeland, and willing to risk everything to keep their rights, liberties and way of life. All of these advantages simultaneously reduced dispute cost for the colonist and raised persuasion cost for the British.

Autonomy within the Empire?

After the battles of Lexington and Concord the *Second Continental Congress* met to create, organize, and finance an army. They also drafted the *Olive Branch Petition* as one last hope for peace. This was sent to King George asking for autonomy within the British Empire; but this was refused. The colonists then named George Washington *Commander of the Colonial Army* (Middlekauff, 2005, 284-287). With the creation of a unified body to make decisions and an army, dispute costs will have fallen even more.

More battles

Around this time, there were two major events. First, the capture of supplies by the colonials from Fort Ticonderoga, which gave them control of the area around Boston, bottling the British in. Second, the Battle of Bunker Hill (June, 1775). Bunker Hill was one of the first major conflicts of the Revolutionary War, and was fought to protect nearby Boston harbor.[25] Even though this battle was a loss for the colonists, it was a huge moral victory. It showed them that they were an equal match for the British. This greatly helped lower dispute costs, *($dispute cost)$_t$*, while raising persuasion cost, *($persuasion cost)$_t$*, for the British - who had until then anticipated an easy war and a rapid victory (Middlekauf, page 298). Moreover, the probability of secession in the minds of both the colonists, pr_t, and the British, Pr_t must both have risen.

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[25] The battle lasted for two days with the colonists fortified on top of Breed's Hill. Although the British eventually took the hill, they suffered heavy casualties. The Colonists had only retreated when they ran out of ammunition.

Thomas Paine, identity and grievance[26]

Another factor promoting the desire to fight for secession occurred in January 1776 when Thomas Paine's *Common Sense* was published. Paine called the colonist's connections to Britain 'illusions'. He said that their rights were not founded in their connection to Britain and its constitution, which was obviously corrupted by tyrants. Until this point it was Parliament that was viewed negatively, with the King at their mercy, but Paine focused on the King and the evils of monarchy. He argued that Americans could not hope for reconciliation, and that any compromise would lead to deterioration of American life. He also used the recent battles and bloodshed as proof that the ties to the motherland had already been severed. The effect of this document cannot be overstated. *Common Sense* showed Americans that independence was not merely an option; it was both necessary and inevitable. Prior to this, independence had barely been on the table, but now the colonists could see that they were participating in an important historical moment (Rothbard, 1976, 137-139, Middlekauff, 2005, 325-6).

Our interpretation is that *Common Sense* shifted equations (3) or (4), $E(NER)_B$, to be even more negative mainly because it raised the perceived value of independence, *($rent)$_t$*, and, by making the situation crystal clear to an ever wider American audience, raised the probability of secession, pr_t. Moreover, it is reasonable to argue that the tract made the colonists even more impatient for secession, so raising their rates of time preference, *r*. The *Declaration of Independence* had become all but inevitable. Paine's book had

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[26] Of course, Paine was not alone as a pamphleteer. Bailyn (1992) says that over 400 pamphlets were published by between 1750 and 1776 by Americans on colonial-British relationships (page 8). He also writes that *Common Sense* "was a superbly rhetorical and iconoclastic pamphlet…an immediate sensation" (page 286).

increased nationalism, and instilled Americans with a desire to fight for their rights against tyrants, to secede from the union, and to govern themselves. It can also be argued that dispute cost had been further lowered - the inspired Americans were willing to 'bear any burden' in a fight for an independent homeland.

The struggle for a new historical equilibrium

Of course, the war of secession had already begun, and in our economic model this is evidence of a positive $E(NER)_B$. The struggle was then on to find a new historical equilibrium: either the British would be successful in turning the American's $E(NER)_B$ negative once again, in which case empire would be re-established; or the colonists would succeed in turning $E(NER)_X$ negative - in which case a new equilibrium would be reached in the southwest corner of figure 2 - the civil war would come to an end and a peace treaty would allow secession.

In June 1776, Richard Henry Lee proposed Independence and on July 4th the *Declaration of* Independence was adopted, being signed August 2nd. It was now an all out war of secession. There were practical reasons for declaring independence besides patriotism. As an independent country, the colonies could get financial and military help from other counties;[27] trading partners outside of the Empire could be found; and being unified against the Empire helped in coordination and funding. Together these things lowered the all-important dispute costs (Middlekauff , 2005, 333 and 372).

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[27] The Continental Congress believed the war could not be won without the help of France. Benjamin Franklin was dispatched to France to start negotiations.

Dispute cost versus persuasion cost

At this point we can view the war as a contest between the level of dispute cost and persuasion cost played out on the battlefield - with each side trying to raise the corresponding cost of the other side while containing its own. With each battle, the equations, in particular (3) and (7), shifted one way or another. With the British attempting turn equation (3) once again negative, and the colonists trying to do the same to equation (7). Dispute cost would rise with too many battles lost, shortage of troops with which to fight, high death tolls, loss of will to fight, or, lack of finance, resources, or, supplies. If these dispute costs became too great to bear, the secessionists would lose - $E(NER)_B < 0$. Conjointly, persuasion cost could rise for the same set of reasons; and if $E(NER)_X$ turned negative Britain would stop fighting, so letting secession happen.

The Americans had a victory at Montreal in late-1775, but suffered a defeat at Quebec. The British evacuated Boston in March 1776 due to lack of supplies, boosting American moral. However, in August, 30,000 British troops arrived in New York and went on to win the Battle of Brooklyn, soon afterwards fortifying the city. This was a major blow to the Americans, who were nearly destroyed in the battle.

Through the rest of 1776, the American army under Washington fought and retreated, and fought and retreated. The northern army under Benedict Arnold lost the battle of Lake Champlain in October. The British captured Fort Washington, NY, and Fort Lee, NJ, in November. Dispute costs were rising as morale fell. The American army was not

being paid much, if at all, and many soldiers chose only to fight in the summer months.

The British were doing quite well, winning territory, although the war was going on

longer than expected. Persuasion cost appears therefore to be dropping with each victory.

However, the main colonial army was never destroyed (Middlekauff, 2005, 346, 525,

558).

Just when it looked as though the dispute cost would be too much for the Americans to

bear, two events saved their war effort. Thomas Paine published *The American Crisis*, a

document that helped rekindle the patriotic fires in the hearts of Americans who were on

the verge of giving up. It urged them to stay the course through the trying times. In

addition, the Americans won Battle of Trenton in December 1776.[28] This battle provided

a much-needed 'pick-me-up' for the troops and and captured supplies and ammunition.

Without this victory, it is doubtful the American army would have lasted much longer.

After Trenton George Washington changed his strategy, deciding that the Americans

would just have to survive long enough for the British to give up the fight (Rothbard,

1976, 197-199, Middlekauff, 2005, 363).

1777 was another year of major ups and downs on both sides of the war.[29]   An important

victory came for the Americans when British General Burgoyne surrendered to American

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[28] This is the battle with Washington's famous crossing of the Delaware and the first major victory for the American army. The Americans crossed the river on Christmas Eve and surprised a drunk and sleeping group of Hessian mercenaries to take the town of Trenton. The battle was short, and the Americans captured 900 prisoners, before marching on and capturing the town of Princeton, successfully pushing the British out of New Jersey.

[29] The British won many battles including the Battle of Brandywine and the Capture of Fort Ticonderoga. The British won a very decisive victory at Germantown, and dealt a blow to the Americans by capturing the acting capital of Philadelphia. They also captured nearby forts, and effectively secured their position in Philadelphia and along the Delaware River.   Despite the victories, the Congress escaped and the American

General Gates at Saratoga, NY, in October, ending British hopes of a two-pronged attack

isolating New England from the rest of the colonies (Middlekauff, 2005, 387, 396, 398,

393). At the end the year, Washington wintered in the now famous Valley Forge. This

was a critical time for the colonial army as it helped shift the tide of the war. Thanks to

the leadership of Washington and the training of the troops by Baron von Steuben a

Prussian drill sergeant, the American army was well trained and hardened into seasoned

veterans by the time it came to break camp in June 1778. Now the colonial army was a

match for the British regulars - dispute cost had fallen again while drastically raising

British persuasion cost (Middlekauff, 2005, 417).

There were more back and forth victories in 1778 and 1779.[30] However, a major event

helped facilitate the American war effort. Thanks to the efforts of Ben Franklin and the

victory of Battle of Saratoga, France was finally convinced to enter the war against its

long time British enemy in February 1778. This greatly lowered dispute costs and raised

persuasion cost, since France had a navy that could fight the British. As the Americans

relied heavily on trade from other nations for supplies and money, controlling the seas

was essential. Lack of a navy had cost the colonies Philadelphia. Though some ships had

been built and many privateers had been hired, they were no match for the Royal Navy.

With France in the fight, the Americans now had better chances of winning the war

(Middlekauff, 2005, 411, 534, 459). That is, pr_t increased. In 1779, America actually won

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army remained intact. The American flag was sown that year, which gave even more patriotic strength to the hearts of the struggling American soldiers.

[30] The armies fought to a standstill at the battle of Monmouth. The Battle was a moral boots in part for the Americans. During the battle, they employed advanced strategic and tactical maneuvers, proving that they had learned to become a top-notch army. The British captured Savanna Georgia and reeked havoc on the south.

a major naval battle. John Paul Jones famously captured a British Man o'war off the coast

of England, giving a much-needed morale boost to the colonies. Later, American George

Rogers Clark captured Vincennes on the Wabash in February of 1779.

In July, both Fairfield and Norwalk, Connecticut, were burned by the British. In addition,

an American attempt to recapture Savanna was defeated (Middlekauff, 2005, 538, 500,

545).

And while 1780 started out well for the British[31] by July the French had shown up and

the tide turned.[32] With the adoption of the *Articles of Confederation* in March 1781, the

Americans now had a more fully functioning government and the French fleet drove

British naval force from the Chesapeake Bay in September.[33]

British persuasion costs were rising steeply now as it was becoming too costly to keep on

sending troops overseas, and there were no major victories at hand. In England people

had become war weary. They had been fighting what should have been a short and easy

war for 5 years. Popular opinion became to leave the colonists to fend for themselves.

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[31] They captured Charlestown, SC, in May, and soon after won another battle nearby at Waxhaw Creek.
[32] The British lost several battles, including King's Mountain in South Carolina where American troops defeated Maj. Patrick Ferguson and one-third of General Cornwallis' army (Middlekauff, 2005, 618, 467). In 1781, there were more wins and losses on both sides, but the Americans and their French allies now had the clear advantage.
[33] That same month in a desperate attempt to keep Washington from marching to Yorktown, Benedict Arnold, now turned traitor, launched an attack from New York on Fort Griswold and Fort Trumbull in the Battle of Groton Heights. Arnold was victorious and burned much of Groton and New London, CT. Nevertheless, Washington did not take the bait, but marched on to Yorktown, VA, where the British finally surrendered in October. (Rothbard, 1976, 282-283, Middlekauff, 2005, 651, 545, 629).

With the union's defeat at Yorktown, equation (7) - Britain's net return from the American colonies, $E(NER)_X$ – shifted decisively from positive to negative and Parliament agreed to sign the *Treaty of Paris* so officially ending the American war of secession. With that the American colonies seceded from the union.

Conclusions

We have introduced no new historical facts rather our contribution is in offering a general model in which known facts can be framed. The advantage of a general model is to incorporate into a single whole existing but partial historical analysis. We have argued that in explaining the outbreak and secessionist conclusion of the American Revolution several clusters of disparate historical events need to be gathered together. There are those clusters that affect the perceived benefits of secession; those that reduced the benefits of remaining in the Empire; those that affected the colonists' impatience with the status quo; yet other clusters that influenced the perceived probability of secession as held in the minds of the secessionists; and still more clusters of factors that influenced the cost of disputing secession with the mother country. Moreover, all of the forgoing clusters are only on the side of the colonists. Similar clusters relate to the benefits and costs of retaining the union as viewed by the Empire.

Finally, we are perfectly well aware that we have not come close to discussing all of the most important historical events surrounding the American Revolution; this is a paper, not a long book. We have to content ourselves with our offering of a new economic analysis of the American Revolution in a handful of simple and summary equations.

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