Watersheds and Turning Points: Conjectures on the Long-Term Impact of Civil War Financing
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Watersheds and Turning Points: Conjectures on the Long-Term Impact of Civil War Financing

It was not until the Civil War had been fought and won [that America] "took off." Louis M. Hacker, 1970

INTRODUCTION

WHAT accounts for the "epochal" changes in capital formation shares and capital goods' prices during the 1860's? The pages following document an epochal rise in American gross saving rates centered on the Civil War decade. They also establish a symmetrical episodic shift in the relative price of manufactured durable investment goods. Not only did the American investment share in GNP rise dramatically (and permanently) between the 1850's and 1870's, but the relative price of capital goods declined sharply over the same period. This relative price change was pronounced and it was never again repeated in a subsequent century of development.

The episodic behavior of both the savings rate and the relative price of capital goods is unique in nineteenth- and twentieth-century American experience and requires far greater attention than it has thus far been given. The present paper does not attempt an exhaustive examination of all potential explanations for the behavior of these two critical historical series. Rather, attention is limited to the role which Civil War financing may have played in contributing to those episodic movements. By 1865, the North had finally succeeded in establishing an effective tax and debt financing structure capable of funding the war effort without reliance on inflationary greenback issues. When war expenditures declined with the termination of hostilities, even the drastic dismantling of the internal tax structure failed to eliminate the large budget surpluses generated in every

This paper was improved considerably by discussion at early stages with my colleagues Samuel Morley and Donald Nichols. Subsequent criticism by Robert Gallman, Stanley Engerman, Peter Lindert, and Richard Sylla helped clarify my ideas still further. The effective assistance of Leo DeBever, James Roseberry and Adair Waldenberg is also gratefully acknowledged. The research underlying the paper has been supported by the National Science Foundation, grant number GS35639.

year up to 1894. How were these federal surpluses utilized, and what impact did policy decisions regarding their utilization have on American capital formation performance through the 1870's? This paper attempts to answer this question by appealing to modern "burden of the debt" theory. The paper also takes a fresh look at those components of the revenue system introduced during the Civil War which survive to the end of the nineteenth century: in particular, the war tariffs.

It is our conjecture that federal debt management and tariff policy can take us quite a distance in accounting for these episodic changes following the 1850's.

THE EPISODIC CHANGES IN CAPITAL FORMATION RATES

Due primarily to the efforts of Robert Gallman,[1] our knowledge of the economic performance of the American economy from the late 1840's to the 1870's has been much improved. The new quantitative evidence confirms a very poor growth performance during the war decade itself. From 1860 to 1870, commodity output growth reached its lowest point anywhere in the nineteenth century, two percent per annum. The same is true of manufacturing value added. Indeed, manufacturing output growth is so slow during the 1860's that its share in total commodity output rises only by one percentage point, from 32 to 33 percent, between the 1860 and 1870 census dates. Nor is this poor performance attributable to southern defeat and subsequent economic chaos below the Mason-Dixon line. If the Confederacy is excluded, the relative share of agriculture in total commodity output actually increases. The annual rate of growth of per capita commodity output in the victorious North was only one percent during the war decade, again the lowest rate in the nineteenth century.[2]

This result is hardly surprising since military conflicts are, after all, expensive in terms of human life, capital stock destruction, and foregone investment. Certainly economic performance in the North

[1] R. E. Gallman, "Commodity Output, 1839-1899," in *Trends in the American Economy in the Nineteenth Century* (Princeton, N.J.: Princeton University Press, 1960) and "Gross National Product in the United States, 1834-1909," in *Output, Employment and Productivity in the United States After 1800* (New York: NBER, 1966).

[2] Much of this paragraph is taken from S. Engerman, "The Economic Impact of the Civil War," *Explorations in Economic History,* III (Spring 1966), 178-83.

within the war decade itself reflects this cost.[3] Frickey's index of manufacturing output shows a much slower rise from 1861 to 1865 than from 1866 to 1870. Similar findings emerge from Wayne Rasmussen's research on agriculture.[4] Our indices of capital formation activities reinforce this characterization. Gottlieb's index of nonfarm residential building, about 30 percent of gross fixed investment in the mid-nineteenth century, reaches a level in 1866-1870 about double that of 1861-1865. Finally, the rate of purchase of farm machinery in Iowa and the sales by McCormick both rise from low levels during the war to much higher levels after 1865. In short, there seems to be no doubt that the Civil War decade in general, and the war years in particular, were ones of unusually poor growth performance. The period 1866-1870 reflects a resurgence in the North which eventually snowballs into a secular boom in the early 1870's.

The more interesting comparison, however, is the 1850's with the 1870's. Apart from its short-term impact, does the Civil War represent a "watershed" in the long-term development of the nineteenth-century American economy? Since the appearance of Gallman's capital formation shares, one of the puzzles which has attracted American economic historians has been the apparent discontinuity in measured capital formation rates between the 1850's and the 1870's.[5] Whether measured in terms of gross investment or gross savings, the capital formation shares in Table 1 rise by about eight percentage points from 1849-59 to 1869-78. Furthermore, if we ignore long swings in these shares (for example, a peak of 16.4 percent in 1854 and a trough of 9.3 percent in 1844), they are fairly stable in the decades prior to and following the Civil War.

Lest the reader feel that these national capital formation share movements are the result of economic conditions associated solely

[3] For a recent accounting of the enormous cost of the Civil War, see C. Goldin and F. Lewis, "The Economic Costs of the American Civil War: Estimation and Implications," Graduate Program in Economic History, University of Wisconsin, EH 73-19 (March 1973).

[4] The remainder of this paragraph is taken from Engerman, "The Economic Impact of the Civil War," p. 184.

[5] J. G. Williamson, "Late Nineteenth Century American Retardation: A Neoclassical Analysis," JOURNAL OF ECONOMIC HISTORY, XXXIII (September 1973), 581-607; idem, *Late Nineteenth Century American Development: A General Equilibrium History* (Cambridge: Cambridge University Press, forthcoming), Chapters 5 and 6; P. Temin, "General-Equilibrium Models in Economic History," JOURNAL OF ECONOMIC HISTORY, XXXI (March 1971), 72-4; L. Davis and R. Gallman, "The Share of Savings and Investment in Gross National Product During the 19th Century," Stanford Research Center in Economic Growth, Memorandum No. 63 (July 1968).

TABLE 1
GALLMAN'S CAPITAL FORMATION RATES ADJUSTED, 1849-1878
(Current Prices)

	Gross Capital Formation (billions $)		*Gross Product (billions $)*		*U.S. Investment Shares (percent)*		*Non-South Investment Shares (percent)*	
Period	*Domestic (GDCF)* (1)	*National (GNCF)* (2)	*Domestic (GDP)* (3)	*National (GNP)* (4)	*GDCF/GDP* (5)	*GNCF/GNP* (6)	*GDCF/GDP** (7)	GNCF/GNP* (8)
1849	.282	.257	2.46	2.43	11.5	10.6	na	na
1854	.554	.541	3.38	3.37	16.4	16.1	na	na
1859	.525	.532	4.09	4.10	12.8	13.0	na	na
1849-1859	.453	.443	3.31	3.30	13.6	13.4	19.4	19.1
1869-1878	1.459	1.364	6.50	6.40	22.4	21.3	27.4	26.0

Source: Cols. (1)-(4): from R. E. Gallman, "Gross National Product in the United States, 1834-1909," Tables A-1 and A-3, pp. 26 and 34. Investment limited to manufacturing durables and new construction, excluding the value of farm improvements made with farm construction materials. In addition, the output figures exclude value added by home manufacturing. Cols. (7)-(8): GDCF and GNCF taken directly from cols. (1) and (2). GDP and GNP multiplied by estimated share of non-South in total U.S. commodity output, where share is .702 in 1860 and .819 from 1870-1880. The shares are taken from Engerman, "The Economic Impact of the Civil War," Table 1, p. 180. See text.

with southern defeat, a crude calculation limited to the northern states should allay his doubts. If the investment shares were identical in South and North, then such a calculation would be unnecessary. Presumably they were lower in the South, if for no other reason than because a larger share of southern accumulation of productive wealth was in a form, at least prior to 1865, which is not captured in capital formation accounting (assets accumulated in the form of slave values and land improvements made with farm construction materials, for example). Suppose we were to make the extreme assumption that *all*, not just the vast majority, of the estimated GDCF and GNCF in Table 1 was location specific to northern states. The GDP and GNP figures must therefore be adjusted to exclude the southern states, while the GDCF and GNCF figures are left unchanged. The resulting estimated investment shares for the non-South are presented in cols. (7) and (8) in Table 1. They still exhibit an abrupt rise between the 1850's and the 1870's, although the rise is a bit more moderate. Thus, the episodic rise in American capital formation shares cannot be attributed to economic dislocations associated with southern defeat and economic exhaustion. How is this secular discontinuity in capital formation shares to be explained and what role might the Civil War play in the explanation?

THE NORTHERN WAR DEBT

It is a curious fact of American historiography that the literature has tended to focus on federal policy toward non-interest-bearing debt (the Greenbacks) issued by the North during the Civil War, while all but ignoring policy towards interest-bearing debt. Mitchell's superb analysis of the Greenback Standard,[6] and Kindahl's classic paper on specie resumption,[7] are excellent examples. Kindahl's interest was in explaining why the resumption of specie payments in 1879 was successful. His concise analysis is now well-known and accepted as conventional wisdom, although the economic impact of this passive deflationary policy is still being debated.[8]

[6] W. C. Mitchell, *A History of the Greenback* (1903); *Gold, Prices and Wages Under the Greenback Standard* (1908).

[7] J. K. Kindahl, "Economic Factors in Specie Resumption: The United States, 1865-1879," *Journal of Political Economy*, LIX (February 1961), 30-48, reprinted in R. Fogel and S. Engerman, eds., *The Reinterpretation of American Economic History* (New York: Harper and Row, 1971), pp. 468-79.

[8] Williamson, "Late Nineteenth Century American Retardation: A Neoclassical Analysis."

To set the stage for our own analysis, it might prove helpful to review Kindahl's scenario regarding Greenback retirement policy up to 1879. In the latter part of 1865, Secretary of the Treasury Hugh McCulloch began a policy of retiring greenbacks from the enormous budgetary surpluses of the immediate postwar period. The House of Representatives passed a resolution in December 1865 approving the policy and supporting McCulloch's resumptionist position. The impact is apparent in Table 2; while interest-bearing debt increased from fiscal 1865 to 1866, non-interest-bearing debt outstanding declined by almost $30 million. In April 1866, Congress began to back off from this active contractionary position. In fact, a congressional bill was passed which legally restricted the Treasury's contractionary policy: in the six months following April 1866 the outstanding stock of greenbacks could be reduced by no more than $10 million, and thereafter the limit was to be no more than $4 million per month. As a result, only $44 million of the greenbacks were retired by 1868. With the rejection of an active greenback retirement policy, the Treasury was then free to use the surplus entirely for the retirement of interest-bearing debt. The federal net (excluding non-interest-bearing securities) debt declined at an accelerating rate following 1866, at least until the Panic of 1873.

Thus, the early contractionary policies of McCulloch were short-lived and they do not reappear until 1877. Indeed, after the Panic of 1873 when Treasury receipts fell off precipitating a sharp diminution in the surplus, $26 million in Greenbacks were reissued. Even during these years of sagging aggregate demand, unemployment and dwindling surpluses, the retirement of the long-term debt continued, although at a sharply reduced rate. The only serious interruption in the long term policy of debt retirement appeared between 1877 and 1879 when Secretary of the Treasury Sherman began to use the federal surplus to retire Greenbacks and to establish a specie stock consistent with Resumption. By January 1, 1879 roughly $133 million in gold had been accumulated for that purpose.

In summary, the absence of an active contractionary Greenback policy during the period up to 1879 as a whole is confirmed by the fact that greenbacks outside the Treasury on June 30, 1866 were $328 million; twelve years later the figure was still $320 million. This Greenback policy freed the Treasury to retire the long-term federal debt. The policy was pursued with a vengeance up to 1893, after which sagging aggregate demand produced federal deficits

TABLE 2
PUBLIC DEBT OF THE FEDERAL GOVERNMENT, 1858-1893
(Current prices, millions of dollars)

Year	*Total Gross Debt* (1)	*Noninterest-Bearing Debt* (2)	*Total Net Debt: (1)−(2)* (3)	*Change in Total Net Debt* (4)
1858	44.9	—	44.9	—
1859	58.5	—	58.5	+13.6
1860	64.8	—	64.8	+6.3
1861	90.6	—	90.6	+25.8
1862	524.2	158.6	365.6	+275.0
1863	1119.8	411.8	708.0	+342.4
1864	1815.8	455.4	1360.4	+652.4
1865	2677.9	458.1	2219.8	+859.4
1866	2755.8	429.2	2326.6	+106.8
1867	2650.2	409.5	2240.7	−85.9
1868	2583.4	390.9	2192.5	−48.2
1869	2545.1	388.5	2156.6	−35.9
1870	2436.5	397.0	2039.5	−117.1
1871	2322.1	399.4	1922.7	−116.8
1872	2210.0	401.3	1808.7	−114.0
1973	2151.2	402.8	1748.4	−60.3
1874	2159.9	431.8	1728.1	−20.3
1875	2156.3	436.2	1720.1	−8.0
1876	2130.8	430.3	1700.5	−19.6
1877	2107.8	393.2	1714.6	+14.1
1878	2159.4	373.1	1786.3	+71.7
1879	2298.9	374.2	1924.7	+138.4
1880	2090.9	373.3	1717.6	−207.1
1881	2019.3	387.0	1632.3	−85.3
1882	1856.9	390.8	1466.1	−166.2
1883	1722.0	389.9	1332.1	−134.0
1884	1625.3	393.1	1232.2	−99.9
1885	1578.6	392.3	1186.3	−45.9
1886	1555.7	413.9	1141.8	−44.5
1887	1465.5	451.7	1013.8	−128.0
1888	1384.6	445.6	939.0	−74.8
1889	1249.5	431.7	817.8	−121.2
1890	1122.4	409.3	713.1	−104.7
1891	1005.8	393.7	612.1	−101.0
1892	968.2	380.4	587.8	−24.3
1893	961.4	374.3	587.1	−0.7

Sources: Col. (1): *Historical Statistics*, Y368, p. 721 as of June 30; Col. (2): Ibid., Y371, p. 721 as of June 30; Col. (3): Col. (1) minus Col. (2).

and a departure from a long term debt retirement commitment which had prevailed for almost three decades.

What was the relative magnitude of the federal deficits and surpluses from 1861 to 1878? Were they sufficiently large to warrant our attention? Gallman's current price GNP estimate for 1859 is 4.17 billion dollars.[9] His estimate for 1879-88 is 11.20 billion dollars.

[9] Gallman, "Gross National Product in the United States, 1834-1909," Table A-1,

TABLE 3
CHANGES IN THE LONG TERM FEDERAL DEBT AS A SHARE IN NON-SOUTH GNP, 1859-1879
(Current Prices)

Period	*Average Annual Increase (+) or Decrease (−) in Net Federal Debt: $\dot{D}(t)$ (billions $)* (1)	Period	*Estimated Non-South GNP* (billions $)* (2)	*$\dot{D}(t)$ GNP* (in percent)* (3)
1849-61	0	1849-59	2.32	0
1861-66	+.447	1859	2.88	+15.5
1866-72	−.086	1871	4.84	−1.8
1872-78	−.004	1875	5.57	−0.1
1869-78	−.041	1869-78	5.24	−0.8

Sources: Col. (1) from Table 2, col. (4); Col. (2) is derived from Gallman's GNP data reported in Table 1, adjusted by Engerman's regional share estimates. In addition, the 1871 and 1875 estimates are derived by applying Kuznets' implied growth rates in his GNP (Variant III) series, 1869-78. S. Kuznets, *Capital in the American Economy* (Princeton, N.J.: Princeton University Press, 1961), Tables R-11 and R-25, pp. 520 and 561.

Perhaps the more relevant yardstick, however, is non-South GNP. Engerman has estimated that northern (non-South) commodity output was 70.2 percent of the U.S. total in 1860 and 82.2 percent in 1880.[10] Making appropriate adjustments in the GNP figures, it appears that the federal surplus was almost two percent of northern GNP in 1882 while the federal deficit in 1865 was some thirty percent of northern GNP. It seems quite evident that northern debt management policy was no small matter when judged by estimated GNP figures for the northern states. As further evidence of the importance of the federal war debt, Richard Sylla has shown that the 1865 economy-wide debt GNP ratio was roughly the same as in 1967.[11] There is clearly a presumption that federal debt management from the Civil War to the late 1870's had an important impact on economic performance in the North. What form did that impact take?

p. 26. The GNP concept used throughout the present paper excludes the value of improvements made to farm land with farm construction materials, value added by home manufacturing, and changes in inventories.

[10] Engerman, "The Economic Impact of the Civil War," Table 1, p. 180. See notes to Table 1 in text. A regional breakdown of GNP is not available, although Robert Gallman has suggested in private correspondence that the South had a smaller share in national GNP than in commodity output. The issue, however, is the behavior of the southern share between the 1850's and the 1870's.

[11] Richard Sylla, "The American Capital Market, 1846-1914," Ph.D. thesis, Harvard University, 1968, p. 177. Chapter V of Sylla's thesis focuses at length on the monetary impact of federal debt policy in the post-bellum period.

CAPITAL FORMATION RATES AND THE WAR DEBT

One favorite explanation for post Civil War "catching up" relies on the redistributive effects of the government debt in the postwar years:

> Relying mostly on loans, the federal government had incurred an enormous amount of debt, most of which was owned by upper-income groups who could save a large part of their incomes. In the postwar years, the interest and principal on the debt was paid by levying regressive taxes. Thus, the federal policy transferred money from consumers to savers, augmenting the amount available for investment and encouraging the expansion of industry.[12]

This position may be well enough embedded in the textbooks to warrant Professor Engerman's attention in his excellent survey article,[13] but one crucial aspect of the position cannot be attributed to those much maligned strawmen, the Beards and Hacker.[14] Nowhere in Hacker's work can reference to *debt retirement* as a redistributive device be found, although he devotes much of his attention to the asserted regressive structure of the postwar tax system. If our reading is accurate, and the treatment of debt and its retirement in pages following is correct, then Hacker is to be applauded. In our judgment, Professor Engerman's test of the redistribution thesis is in error. Engerman computes the aggregate current dollar amount of interest payment *plus* the debt retirement, 1866-1890. He then assumes that high income recipients had a savings rate in excess of low (taxed) income groups by 0.40. Under these assumptions, "the redistribution would have increased the share of net capital formation . . . by less than eight-tenths of a percentage point."[15] Is this estimate relevant in evaluating the contribution of debt management to the remarkably high private capital formation rates in the 1870's? We think not. We shall argue that government debt retirement should foster a comparable expansion[16] in private debt and thus in

[12] H. E. Krooss, *American Economic Development* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1955), pp. 459-60.

[13] Engerman, "The Economic Impact of the Civil War," p. 191.

[14] C. A. and M. R. Beard, *The Rise of American Civilization* (New York: Macmillan, 1930). L. M. Hacker, *The Triumph of American Capitalism* (New York: Columbia University Press, 1947), and *The Course of American Economic Growth and Development* (New York: Wiley, 1970).

[15] Engerman, "The Economic Impact of the Civil War," p. 191. The savings rate differential of .40 is taken from S. Kuznets, *Shares of Upper Income Groups in Income and Savings*, NBER, Occasional Paper No. 35, 1950.

[16] Technically, the statement should read "almost comparable" since as private savers attempt to replace the now retired government debt by private debt, the rate of

measured private capital formation. The argument requires some familiarity with modern burden of the debt theory.

The modern view of the government debt burden emphasizes the competition between public and private securities.[17] Private securities are claims on private physical assets or capital. Public securities may guarantee a given rate of return to the holder, but they do not represent claims on productive assets; rather they simply represent claims on tax revenue. The assumed lack of social productivity of government debt is certainly obvious in the case of war financing. If we agree that increased government debt does not represent claims on a comparable increase in productive capacity, then it clearly follows that the presence of government debt implies a burden on future generations since growth through capital formation is foregone. Individual savers may be indifferent between public and private debt in satisfying wealth accumulation motives, providing, of course, that Treasury officials offer government debt at rates competitive with more risky private debt, but the presence of government debt clearly implies lower levels of private capital stock and lower levels of future GNP. Figure 1 illustrates this argument. Present and future output levels are related by a transformation curve whose shape reflects diminishing returns to capital accumulation in the absence of labor force growth or technical progress. Given collective tastes regarding present and future consumption, a peacetime equilibrium would occur at, say, P, where the optimal investment would be I^p_t If the government is to float war debt successfully amounting to, say, ΔD^w_t, it must induce bond holders to diminish their new purchases of private debt and thus the

return on private capital diminishes, thus inhibiting a completely comparable expansion in private capital. This follows as a corollary of "Mill's test" of the burden of the war debt, discussed below.

[17] See, for example, P. A. Samuelson, "An Exact Consumption-Loan Model of Interest With or Without the Social Contrivance of Money," *Journal of Political Economy*, LXVI (December 1958), 467-82; W. G. Bowen, R. G. Davis and D. H. Kopf, "The Public Debt: A Burden on Future Generations," *American Economic Review*, L (September 1960), 701-6; F. Modigliani, "Long-Run Implications of Alternative Fiscal Policies and the Burden of the National Debt," *Economic Journal*, LXI (December 1961), 730-55; P. Diamond, "National Debt in a Neoclassical Growth Model," *American Economic Review*, LV (December 1965), 1126-51.

This section draws on similar work Professor Kelley and the author have completed on Japan: A. C. Kelley and J. G. Williamson, "Military Imperialism and Fiscal Policy: *Sake* Versus Swords in Meiji Japan," Discussion Paper EH 72-12, Graduate Program in Economic History, The University of Wisconsin (November 1972); *Lessons from Japanese Development: An Analytical Economic History* (Chicago: The University of Chicago Press, forthcoming), Chapter 8.

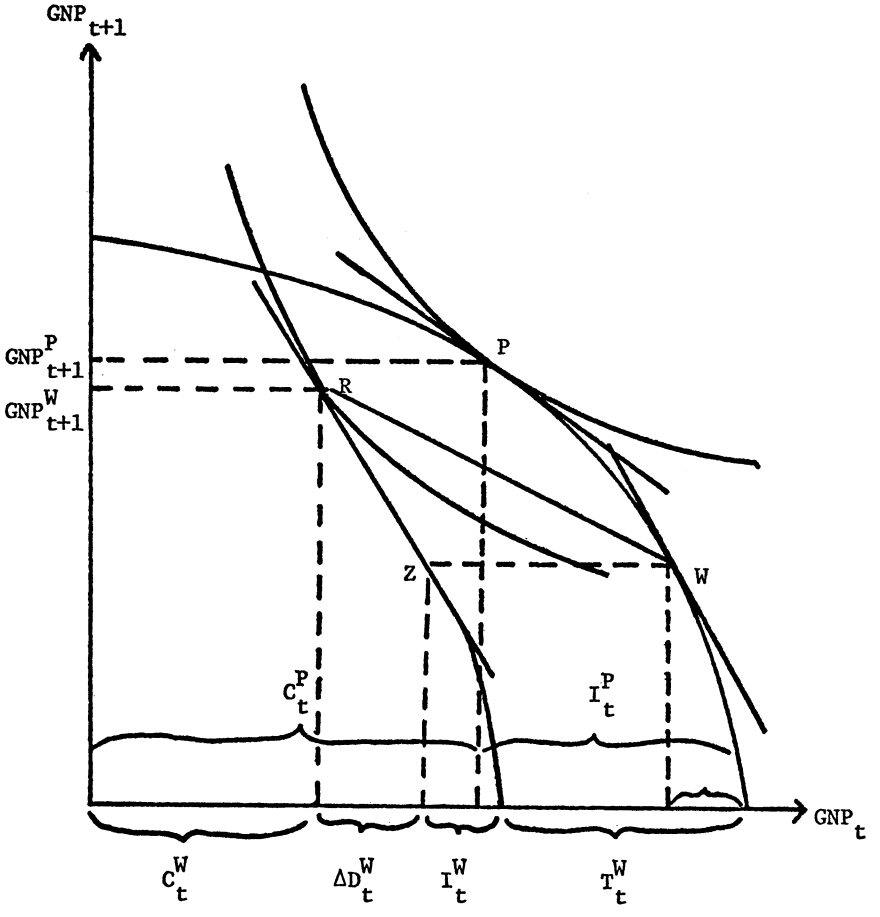

FIGURE 1
THE BURDEN OF THE WAR DEBT

Source: See text.

real capital formation upon which that debt lays claim. Figure 1 illustrates one such result where the interest rate at W is driven upwards,[18] where capital formation contracts ($I_t^P > I_t^W$), where the current tax burden necessary to pay interest on the new debt is T_t^W, where current consumption is diminished ($C_t^P > C_t^W$), and finally

[18] In reality, appeals to patriotism may influence this result but little evidence of this can be found in reading the Reports of the Secretary of the Treasury from 1861 to 1865. In addition, unexpected price inflation may also catch investors unaware so that the *real* rate of interest may be observed to decline during wartime. Finally, we have implicitly assumed the tax system to be neutral when in fact during and after the Civil War it was regressive and also taxed consumption heavily.

where the future GNP levels are reduced ($GNP^{P}_{t+1} > GNP^{W}_{t+1}$). A new wartime equilibrium is reached at R where society holds two types of "bonds": war debt, ΔD^{W}_{t}, and private capital, I^{W}_{t}. The tax burden, T^{W}_{t}, is required to pay interest on the war debt. The rate of return on private capital is determined by the slope of the line at W while the social rate on (unproductive) war debt is zero—although the rate to an individual holder of war bonds is the same as on private "bonds." The resulting net social rate of return is determined by the slope of the line RW and this, of course, is less than that at P—the magnitude depending, among other things, on the size of the war debt issue. Quite apart from other methods of financing a war effort, government debt issue suppresses current capital formation and consumption. It also results in lower growth rates.

Recent economic historians have debated whether growth and capital formation were below normal during the Civil War. As we have seen above, the evidence overwhelmingly supports the thesis of poor growth and low rates of private capital formation. Indeed, the quantification would have surprised few contemporary policy makers who were well aware, even as late as 1868, that ". . . the present accumulation of new capital in the United States . . . is at a much slower rate than it ought to be, and than it necessarily would be under entirely healthy and natural conditions."[19] Yet, factors inevitably cited for the dismal economic performance during the Civil War decade are (1) paper currency, (2) unequal and heavy taxation, and (3) a limited supply of skilled labor.[20] What is curious about the debate is the silence on the issue of long term debt financing. As a share in the 1859 non-South GNP, annual increases in the federal long term debt amount to more than 15 percent. This figure is almost equal to the non-South GDCF/GNP share of 19.4 percent, achieved in the 1850's.[21] It seems unlikely that we need search

[19] *Report of the Special Commissioner of the Revenue,* 41st Cong., 2nd Sess., Executive Document No. 27, December 20, 1869, p. xxvi.

[20] *Report of the Special Commissioner of the Revenue,* 40th Cong., 3rd Sess., Executive Document No. 16, January 5, 1869, p. 11.

[21] Actually, this debt burden is an underestimate since it excludes significant state and local war debt issued during the hostilities. For example, in 1861 the following authorizations were made by state governments in the North: New York and Pennsylvania, $3,000,000 each; Connecticut, New Jersey, Indiana and Ohio, $2,000,000 each; Massachusetts, Maine, Illinois and New York City, $1,000,000 each; Iowa, $800,000; and Michigan, $500,000. The resulting 1861 total state authorization was $19.4 million which is to be compared with the federal new

further for the causes of the disappointing capital formation performance during the Civil War. The North could hardly have achieved significant rates of capital accumulation, "burdened" as she was with war financing. No doubt, those Americans purchasing federal debt were happy with the arrangement and felt no burden on their attempts to improve their wealth position. It was private capital, and thus society as a whole, that suffered the debt burden.

A long digression is necessary at this point. Our argument thus far is directed toward the *form* of government expenditure financing, rather than the composition of expenditures. A tax system could have been devised, of course, which only diminished consumer expenditures holding investment rates intact. Such was not the case under the war debt financing measures actually implemented since private investment expenditures were sharply curtailed while non-investment expenditures shifted from private consumption to public military expenditures. John S. Mill understood the "modern" view of the debt burden well enough, although contemporary economic historians have apparently forgotten his strictures. Mill proposed an index of the burden by reference to the rate of interest:

> . . . what is wanted is an index to determine whether, in any given series of years, as during the last great war for example (i.e., 1793-1815), the [war debt] limit has been exceeded or not . . . . Such an index exists . . . . Did the government by its loan operations, augment the rate of interest?[22]

That is, Mill's "test" relates to the rise in interest rates from the war debt induced shift from point P to W in Figure 1. Presumably, it is the *real* rate of interest that counts in this test.

With regard to Mill's test, it should be noted that Secretary Dix's and Chase's early difficulties in floating war debt were not only a function of federal military success, but also of Congress' tendency to ignore the shape of the transformation function in Figure 1 and Mill's test. That is, they thought they should be able to get the old peacetime rate, at P, on the new bond issues, rather than the higher competitive rate, at W or R, required to divert private savings into the war effort. Prior to the third Legal Tender Act, Congress imposed difficult, if not impossible, restrictions on Treasury debt

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debt issues of $25.8 million. Thus in the early years of the war, ". . . the market for bonds was stocked with the securities of several states which were negotiating war loans." W. C. Mitchell, *A History of the Greenbacks*, p. 20.

[22] J. S. Mill, *Principles of Political Economy* (London: Longmans, Green and Company, 1909), p. 874.

operations. Not only did they limit the amount which could be floated abroad, but the terms of the new issues—the mix of the bonds by year to maturity, the interest rate, *and* the acceptable price below par—were often sufficiently unrealistic to make long term debt financing impossible. The third Legal Tender Act released the Treasury from these restrictions[23] and the way was clear to diminish reliance on Greenbacks. Long term debt financing became the order of the day.

Yet, this accounting of the economic impact of the Civil War is not meant to relegate greenback financing to an insignificant role, but only to urge equal attention to long term debt financing. True, the greenback phase was brief. After all, Lincoln approved the first Legal Tender Act on February 25, 1862, while the third Legal Tender Act was passed on March 3, 1863 and no further authorizations took place thereafter. The resulting inflation served as an effective once-and-for-all tax on all monetary assets. The greenback issues had another impact as well. It made long term debt financing far easier by fooling savers and made Mill's "test" of limited value. Wartime debt issue is normally accompanied by unanticipated inflation so that the resulting real rate may fall below its equilibrium rate at W in Figure 1. Indeed, the real rate did decline during the war years although the nominal rate crept upward. Furthermore, there is some evidence that politicians were well aware of these influences. Congressman Watts argued, during the House debate over the third Legal Tender Act, that greenbacks should be issued ". . . until the rate of interest should come down to such a reasonable notch that the government could afford to go with some prospect of ultimately paying the amount of its indebtedness and interest."[24] If Congressman Watts meant the *nominal* rate of interest, then he was the first American Keynesian—and he would have been wrong, since the nominal rate crept upwards as inflation continued at a rapid rate. If we take the more generous view that Watts had the *real* rate of interest in mind, then he was the first American Friedmanian (Fisherian)—and he was right, since the real rate declined as the inflation was poorly anticipated.

[23] W. C. Mitchell, *A History of the Greenbacks,* p. 120, suggests that "more efficient methods of negotiating loans were devised." It seems more appropriate to stress that the Treasury was now able to pursue more *competitive,* rather than efficient, methods of negotiating loans.

[24] W. C. Mitchell, *A History of the Greenbacks,* p. 115.

What happens when the war is terminated and no further debt financing is necessary? Will the war debt be maintained or will it be retired and/or exported abroad? If retired, at what rate? A corollary of the above analysis is that debt retirement will *stimulate* capital formation rates and augment the rate of output growth. We have then a testable prediction. Beginning with 1866, not only was there retirement of domestic holdings of federal war debt, but an increasing share of the outstanding debt was exported abroad.[25] Thus, we should observe sharp increases in private capital formation rates and accelerating growth performance. The peacetime capital formation and output growth rates should not only exceed those of the war decade, but they also should exceed that of the 1850's preceding the war. In short, a "catching up"[26] should have been the inevitable result of the government debt retirement policy, at least from 1866 to 1878.

Following the arguments underlying Figure 1, and in contrast with Professor Engerman, debt retirement must be viewed as augmenting private GDCF by a like amount. To this positive GDCF stimulus must also be added the asserted redistributive impact of interest payments. Table 4 reports this calculation for the 1850's, 1860's and 1870's. The underlying counterfactual being posed is: What would Gallman's private capital formation shares have been had the debt *not* been retired, and thus had individuals been allowed to satisfy partially their wealth motives by existing government war debt? The calculation assumes along with Engerman that interest recipients had savings rates in excess of the low income classes, those upon whom the asserted regressive consumption (internal and tariff) taxes fell: the difference is taken to be 0.40. The result of this computation appears in col. (3). The *total* impact of federal debt management appears in col. (5). By our reckoning, the non-South GNCF share may have been augmented by as much

[25] Jay Cooke estimated that as much as $1 billion of the long term federal debt had reached Europe even by 1869. (The total long term federal debt outstanding in 1869 was $2.2 billion. See Table 2.) The migration of Union securities to Europe can be viewed as another form of "retirement" since this made it possible for Americans to substitute private domestic capital for their (unproductive) holdings of government debt. It seems likely on these grounds that our accounting of the contribution of federal debt operations on the high GDCF rates in the 1870's is grossly understated. The size of the understatement clearly depends on how much foreign lending would have taken place in the absence of a European option to purchase Union securities.

[26] The term is used by Engerman in "The Economic Impact of the Civil War," p. 182.

TABLE 4
IMPACT OF FEDERAL DEBT MANAGEMENT AS A SHARE IN NON-SOUTH GNP, 1859-1879
(Current Prices)

Period	*Average Annual Interest on the Federal Debt:* $i(t)D(t)$ (*billions $*) (1)	Period	*Estimated Non-South* GNP* (*billions $*) (2)	$(.4)i(t)D(t)$ / GNP* (*percent*) (3)	$\dot{D}(t)$ / GNP* (*percent*) (4)	$\dot{D}(t)-(.4)i(t)D(t)$ / GNP* (*percent*) (5)
1849-61	0	1849-59	2.32	0	0	0
1861-66	.051	1859	2.88	+0.7	+15.5	+14.8
1866-72	.132	1871	4.84	+1.0	−1.8	−2.8
1872-78	.105	1875	5.57	+0.8	−0.1	−0.9
1869-78	.112	1869-78	5.24	+0.9	−0.8	−1.7

Sources: Col. (1), from *Historical Statistics*, Y354, pp. 718-9; Col. (2) and (4) from Table 3; Col. (3), see text.

as three percentage points in 1866-1872, and almost two percentage points in 1869-1878 through federal debt management. This estimate is likely to be a lower bound since it fails to account for the massive and continual outflow of Union securities to Europe by the late 1860's. If foreign lending were taken into account, perhaps as much as half of the seven percentage point increase in the GNCF share between the 1850's and the 1870's would be explained by federal debt management.

In summary, we have argued in this section that most of the poor capital formation performance during the Civil War decade can be readily explained by federal long term debt issue and the resulting diversion of private savings from capital formation activities. How much of the poor GNP per capita growth performance during the same period can be attributed to suppressed capital formation is a separate issue, but it seems likely that detailed analysis would suggest only secondary roles for the Greenback issue and labor shortage. We also have argued that of the seven percentage point rise in the northern GNCF/GNP ratio between the 1850's and the 1870's, perhaps as much as half of the rise can be attributed to debt retirement and the redistributive impact of interest payments on the debt. Can we account for any of the remaining three to five percentage points by appealing to other aspects of federal war financing policy? Our search will now take us to the second "episodic" change during the 1860's: the abrupt decline in the relative price of capital goods.

CAPITAL FORMATION RATES AND THE RELATIVE PRICE OF INVESTMENT GOODS

Gallman's data document an even greater rise in the economy-wide investment shares between the 1850's and 1870's when constant price series are used. The explanation is apparent in Figure 2. Three relative prices of critical interest are presented there. The first of these is Gallman's implied ratio of capital goods' prices to the GNP price index, P_{GDCF}/P_{GNP}. Note that the relative price of investment goods declines sharply between 1859 and 1869-1878. The series also exhibits a mild downward trend in the relative price of investment goods up to 1859, while relative stability is the rule after the 1870's. A roughly comparable pattern emerges when a similar index is constructed for textiles,[27] P_{GDCF}/P_{Output}, although the wide amplitude of raw cotton price fluctuations induces some spurious movements in textile prices and thus the relative price ratio. The main conclusion is abundantly evident: whether examined at the industry or national level, the average relative price of capital goods in the 1870's is far below that of the 1850's. The only point of issue would appear to be how much of the secular decline is centered on the late 1850's and how much on the war decade itself. A third index, also based on Gallman's data, is presented in Figure 2 which indicates which component of GDCF is undergoing the decline. Apparently, the relative price of producer durables underwent a dramatic plunge between 1859 and 1869-1878. Furthermore, the decline continues up to 1879-1888 and it is only an offsetting rise in construction costs which produces stability in the relative price of capital goods after the 1870's. Given these price trends, it should come as no surprise that the constant price share of producer durables investment in GDCF rises from 22 percent in 1854 to 45 percent in 1879-1888.[28] We can also conclude that the direction of causation is from relative price change to investment mix change, since the relative price of investment goods declines in spite of the enormous increase in capital formation rates and the abrupt shift in its composition towards producer durables.

[27] P. McGouldrick, *New England Textiles in the Nineteenth Century* (Cambridge: Harvard University Press, 1968), Table 46, pp. 240-41, deflated by textile price index reported in *Historical Statistics*, E-5, p. 115. While the textile industry price index is available on an annual basis, the economy-wide Gallman index is not. Indeed, the figures after 1860 refer to decade averages.

[28] Calculated from Gallman, "Gross National Product in the United States, 1834-1909," Table A-3, p. 34.

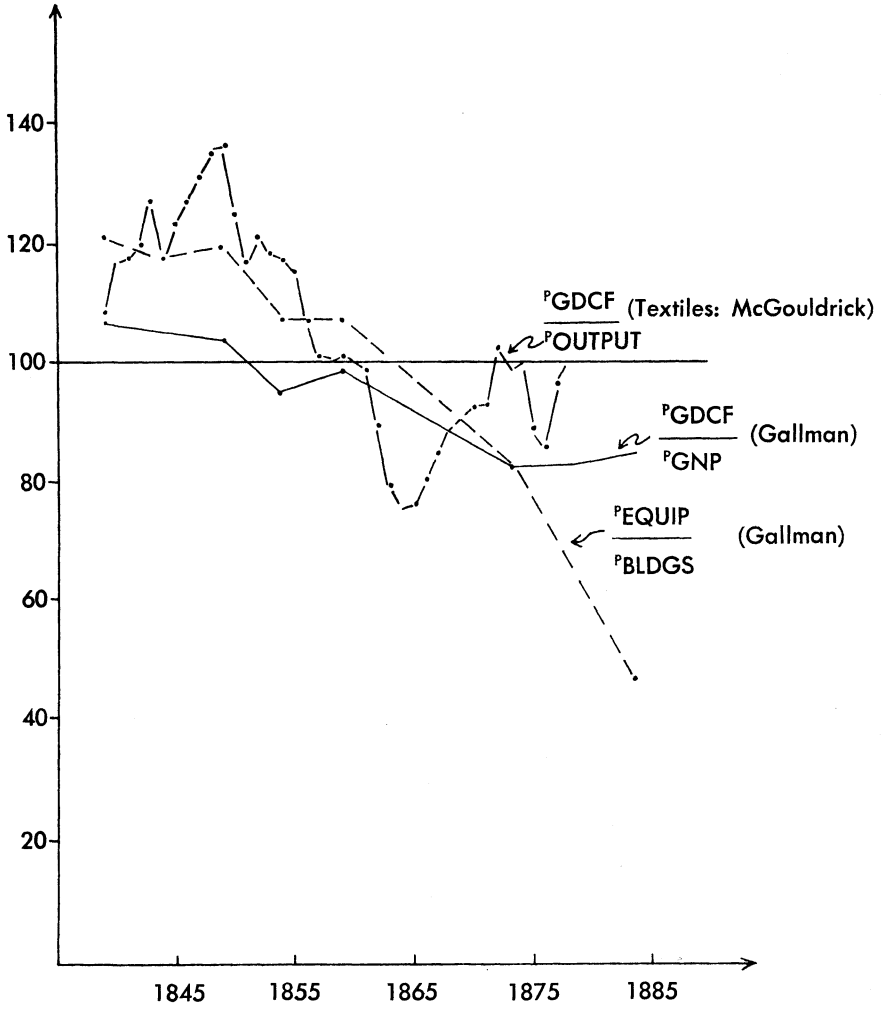

FIGURE 2.
RELATIVE PRICES OF CAPITAL GOODS: McGOULDRICK AND GALLMAN (1839-1883)

Source: See Table 5 and text.

These relative price trends are sufficiently unique to warrant a lengthy digression at this point. In 1961, R. A. Gordon published a paper which has been very influential, at least on growth theorists.[29] Gordon documented a long term secular *rise* in the relative

[29] R. A. Gordon, "Differential Changes in the Prices of Consumers' and Capital Goods," *American Economic Review*, LI (December 1961), 937-57.

price of capital goods dating from the 1870's, although he emphasized the upward surge from the turn of the century. Granted price measurement problems are immense given product quality changes over long secular periods, but, "to deny the existence of these differential price trends is to deny the validity of the deflated estimates of the components of the GNP on which we all so heavily rely."[30] Gordon's observation is reproduced in Table 5, where the long term

TABLE 5
RATIO OF CAPITAL GOODS' PRICES TO GNP PRICE INDEX, 1839-1953
(1929 = 100)

Year	P_{GDCF}/P_{GNP}	*Year*	P_{GDCF}/P_{GNP}
1839	111.9	1899-08	77.2
1849	109.4	1909-18	94.8
1859	103.4	1919-28	100.3
1869-78	86.6	1929-38	107.9
1879-88	89.3	1939-48	108.5
1889-98	81.2	1944-53	111.6

Sources: 1839-1899/08 from R. Gallman, "Gross National Product in the United States, 1834-1909," Tables A-1 and A-3, pp. 26 and 34; 1909/18-1944/53 from S. Kuznets, *Capital in the American Economy*, Tables R-25, 26, and 29, pp. 561-4 and 572-4.

series of P_{GDCF}/P_{GNP} (1929 = 100) is extended backward to 1839 using Gallman's data. The sharp decline in investment goods' prices during the Civil War decade is even more remarkable when viewed in terms of a century of development between 1839 and 1953. Although the indices record a mild decline in relative investment goods' prices from 1839 to 1859 and from 1869-78 to 1899-1908, nowhere in American economic history can we find another episode like the Civil War decade. The abrupt decline in the relative price of investment goods during that brief decade and a half appears to be unique. A watershed indeed!

What accounts for this unusual decline in the relative price of capital goods? If an answer to this question is forthcoming, then it may help complete our explanation of the episodic rise in the current price savings rate as well. Presumably, the relative cheapening of capital goods must have encouraged private savings as the profits accruing to these machines rose relative to their cost. In the previous section we argued that perhaps as much as half of

[30] Ibid., p. 937.

the rise in the current price savings rate after the Civil War decade could be accounted for by the rapid debt retirement which coincides with the "catching up" phase through the 1870's. The debt retirement effect must have been reinforced by the decline in capital goods prices and the resultant rise in yields and profit rates. In addition, while the impact of debt retirement peters out by the early 1880's, the episodic fall in capital goods' prices is more permanent since the relative price of capital goods not only remains at low levels but continues a gradual decline between the 1870's and the turn of the century (see Table 5).

If we view the episodic decline in capital goods' prices as a source of disequilibrium, then our argument rests on the prediction that the rate of return to equity capital must have risen to abnormally high levels as long as the system remained in disequilibrium. Is this in fact the case for the mid-nineteenth century? Presumably, if the rate of return to equity capital is rising, so too must be the yields on gross substitutes, such as federal, state and municipal bonds. Table 6 presents yield data on two such gross substitutes, federal bonds ("selected market quotations") and New England municipal bonds. Cols. (3) and (4) estimate *real* yields adjusted by the expected rate of price inflation. Based on the relative capital goods' price data displayed in Table 5, we would expect real yields in the 1870's to exceed by far the real yields in the 1850's. Indeed, this is the case. The average yield on federal bonds between 1845 and 1861 was 3.91 percent, while the comparable figure for 1867-1878 is 8.85 percent. New England municipals exhibit a similar increase: from 4.08 to 9.82 percent.[31] In comparing the 1850's with the 1870's, only from 1858 to 1861 do real yields compare favorably with those attained in almost every year after 1866. The evidence seems to point to the Civil War decade as a source of disequilibrium which produces this discontinuity in both relative capital goods prices and real yields. What exogenous forces might account for this unique behavior centered on the 1860's?

[31] One cannot be too confident in *any* estimate of price anticipations, but the trends in cols. (3) and (4) of Table 7 are produced under all the numerous weighting schemes tried. Obviously, the short-run impact of Greenback inflation was important. The emphasis of this paper, however, is the long run. Indeed, economic performance *during* the war years is intentionally ignored for this reason. The contrasting short-run impact of the war is apparent when we note that real yields were ***negative*** from 1862 to 1865.

WAR TARIFFS AND THE RELATIVE PRICE OF INVESTMENT GOODS

To what extent might the war tariffs account for the episodic behavior of these relative prices and yields? The Civil War tariffs

TABLE 6
REAL AND NOMINAL YIELDS ON LONG TERM HIGH GRADE BONDS, 1845-1878

	$r_N(t)$: *Nominal Yield (%)*		$r(t)$: *Real Yield (%)*	
Year	*Federal Bonds, "Selected Market"* (1)	*New England Municipal Bonds* (2)	*Federal Bonds, "Selected Market"* (3)	*New England Municipal Bonds* (4)
1845	5.16	4.86	0.63	0.33
1846	5.50	4.92	2.89	2.31
1847	5.77	5.14	−0.35	−0.98
1848	5.71	5.31	8.92	8.52
1849	5.16	5.31	7.21	7.36
1850	4.58	5.13	4.36	4.91
1851	4.47	5.08	4.47	5.08
1852	4.39	4.98	0.89	1.48
1853	4.02	4.99	−3.74	−2.77
1854	4.14	5.13	−6.15	−5.16
1855	4.18	5.16	−1.36	−0.38
1856	4.11	5.10	5.40	6.39
1857	4.30	5.19	2.00	2.89
1858	4.32	5.03	16.22	16.93
1859	4.72	4.81	7.72	7.81
1860	5.57	4.79	7.77	6.99
1861	6.45	5.04	9.55	8.14
Average 1845-61			3.91	4.08
1867	5.34	4.97	11.33	11.70
1868	5.28	4.62	8.79	9.45
1869	5.37	4.07	8.15	9.45
1870	5.44	4.24	12.17	13.37
1871	5.32	4.18	10.02	11.16
1872	5.36	3.70	3.11	4.77
1873	5.58	3.51	3.82	5.89
1874	5.47	3.42	6.80	8.85
1875	5.07	3.30	8.95	10.72
1876	4.59	3.66	10.19	10.12
1877	4.45	3.81	8.65	9.29
1878	4.34	3.97	14.25	14.62
Average 1867-78			8.85	9.82

Sources: $r(t) = r_N(t) - \dot{P}_e(t)$, where $\dot{P}_e(t) = (.6)\dot{P}(t) + (.3)\dot{P}(t-1) + (.1)\dot{P}(t-2)$ and $\dot{P}$ is the rate of price inflation. Cols. (1) and (2) from S. Homer, *A History of Interest Rates*, Table 38, pp. 287-8; Cols. (3) and (4) use $\dot{P}_e(t)$ calculated from the Warren-Pearson index, *Historical Statistics*, E-1, p. 115.

were enormously protective by any standard. Originally introduced as a revenue device to finance northern military expenditures, they became a permanent institution with northern victory. The late nineteenth century can be contrasted with trends during the antebellum decades. The period of the 1850's was one of mild reversal from the protectionist policies of the preceding decades. The "war tariffs" signaled an abrupt departure from a path which appeared to lead to relatively free trade.[32] Although the 1872 Tariff Act moderated the protective tariffs of the 1860's somewhat, its life was brief, since the Act of 1875 witnessed a full return to the war levels. In short, after 1861 America shifted to a policy of very stiff protection. This tariff history is well known,[33] but perhaps its implications have not been fully appreciated. The tariff schedule was far more protective of "final" manufactures than of intermediate products and/or capital goods. Obviously, one component of investment, plant construction and social overhead, was a nontradeable which clearly failed to receive direct benefits from the protectionist policy. How about the second component, producer durables? With the outstanding exception of railroad rails, finished capital goods were rarely traded in this phase of American development. Ferrous metal products in intermediate stages *were* traded, however, and the Civil War tariff schedule protected these products extensively (iron and steel products, for example). Ferrous metals were inputed directly into producer and consumer durables production. But since their cost was a small component of the total costs of durable goods, the impact of the tariff on the domestic price of producer durables was far smaller than the impact on final consumer nondurable manufactures. In short, there can be little doubt that the tariffs acted to lower the price of producer durables, not only relative to manufactured consumer goods but also relative to new construction.

A full accounting of the impact of the Civil War tariffs requires a general equilibrium model, however. Such a model has been analyzed elsewhere[34]; the discussion here will be limited to the

[32] Whether the sharp shift to a protectionist policy would have been forthcoming in the absence of the Civil War is an issue we would prefer to sidestep.

[33] F. W. Taussig, *The Tariff History of the United States* (New York: Augustus M. Kelley, 1967).

[34] J. G. Williamson, "What Should the Civil War Tariffs Have Done Anyway?," University of Wisconsin, Madison, Wisconsin, September 1973. Mimeographed. The paper is available upon request. A similar argument has been suggested for antebellum tariff experience in J. G. Williamson, "Optimal Replacement of Capital Goods:

structure of the model and its predictions. The framework consists of four commodities and five factors of production. We hope it captures the essential character of the northern economy during the Civil War decade. The four commodities consist of agricultural products, manufactured consumer goods, manufactured producer durables and construction services. The latter is considered a nontradeable whose price is determined endogenously. The remaining three commodities are traded and their prices are jointly determined by world market conditions and American tariff policy. Agriculture uses a mobile factor, unskilled labor, and land. Consumer goods manufacturing uses unskilled labor and capital. It does not use skilled labor. Manufactured producer durables and construction use both skilled and unskilled labor, but construction is assumed to rely more heavily on unskilled labor.

When the Civil War tariff schedule is introduced into this general equilibrium model, what are its predictions? First, the relative price of farm products declines, thus helping precipitate farm discontent. Second, the price of new construction rises relative to that of manufactured producer durables, a result fully consistent with Figure 2. Third, the price of capital goods (a weighted average of new construction and manufactured durable prices) declines relative to manufactured consumer goods, a prediction consistent with McGouldrick's data on textiles reproduced in Figure 2. Fourth, the price of capital goods declines relative to the implicit GNP price deflator, a result consistent with the episodic fall documented in the previous section. Fifth, the rate of return on industrial capital rises at a rate exceeding that of the tariff itself, a result consistent with the episodic rise of real yields reported in Table 6.

In summary, it seems likely that Hacker and the Beards were on the right track. It seems highly plausible that the more enduring economic impact of the Civil War is to be found in the tariff structure. Furthermore, the tariff system is best analyzed in terms of its impact on the price of investment goods relative to the tariff-ridden price of manufactured consumer goods.

We might note in passing that the model also resolves other "paradoxes" which have characterized past debate on this important

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The Early New England and British Textile Firm," *Journal of Political Economy*, LXXX (September 1972), 1320-34 and D. L. Brito and J. G. Williamson, "Heterogeneous Labor Inputs and Nineteenth Century Anglo-American Managerial Behavior," *Explorations in Economic History*, X (Spring 1973), 235-52.

phase of American development. While it predicts a surge in unskilled wages relative to investment goods prices in response to the tariffs, it also predicts a *negative* influence on real wages (nominal wages deflated by consumer goods' prices).[35]

These predictions certainly conform to the historical data presented in Table 7. Let us sidestep the debate between Mitchell and Kessel and Alchian[36] by focusing our attention on the period following the Greenback episode. Why does it take so long for real wages to recover their 1860 levels? Table 7 suggests that it is not until 1869 that real wages reach their prewar levels. The complex, regressive and burdensome system of indirect (consumption goods') taxes was finally established by 1864. The process of dismantling the system was slow and, in the case of indirect taxes, was completed only by 1868.[37] As a result, it is hardly surprising that real wages reached their 1860 levels only by 1869, since the consumers' price index is based on retail prices which include the effect of indirect consumption taxes.

Yet real wages during the 1870's certainly do not exceed their 1860 levels by impressive amounts given that the postwar decade was a period of "catching up" and unusually high GNP per capita growth rates. But the unusually slow growth in real wages occurred simultaneously with a surge in the price of men compared with

[35] The model makes other predictions as well which bear noting. The war tariffs should have tended to reduce the wage differential between skilled and unskilled. In fact, Clarence Long's data document a remarkable stability in the ratio of skilled to unskilled daily wages between 1862 and 1878. Setting the ratio at 100 in 1862 produces an index in 1878 of 98.9. (Long, *Wages and Earnings in the United States*, Tables A-10 and A-12, pp. 152 and 154). The period 1862-1878 apparently represents a reversal of the antebellum trend since wage differentials increase from the 1820's to the 1850's. (Brito and Williamson, "Heterogeneous Labor Inputs," p. 238). The model also predicts that the war tariffs should have precipitated an unusually rapid rate of industrialization as measured by the changing share of manufacturing value added in GNP. In historical fact, the unusual acceleration in manufacturing expansion during the "catching up" phase is well-known. Indeed, Robert Fogel has shown that manufacturing's share in GNP increased between 1869 and 1884 at a rate higher than any other in nineteenth century history. (R. W. Fogel, *Railroads and American Economic Growth* (Baltimore: John Hopkins Press, 1964), p. 121.)

[36] R. A. Kessel and A. A. Alchian, "Real Wages in the North During the Civil War: Mitchell's Data Reinterpreted," *Journal of Law and Economics*, II (October 1959), reprinted in R. Andreano (ed.), *The Economic Impact of the Civil War* (Cambridge: Schenkman, 1967), pp. 11-30.

[37] The tax history can be found in H. E. Smith, *The United States Federal Internal Tax History From 1861 to 1871* (New York: Houghton Mifflin, 1914). Phelps-Brown has compiled American nonfarm real earnings data that suggest that real wages do not recover their 1860 levels until 1873-1874. E. H. Phelps-Brown, *A Century of Pay* (London: Macmillan, 1968), Appendix 3, pp. 448-9.

machines (Table 7, col. 5). One cannot avoid the obvious conclusion that the war tariffs has a great deal to do with these "paradoxical" trends.

TABLE 7
REAL WAGES IN MANUFACTURING AND A RELATIVE COST OF LABOR INDEX: 1851-1878
(1860 = 100)

Year	*Nominal Wage: Manufacturing Daily Wage* (1)	*Real Daily Wage in Manufacturing*		*Index of Capital Goods Prices* (4)	*Relative Cost of Labor* (1) ÷ (4) (5)
		Cost of Living Deflated (2)	*Adjusted Cost of Living Deflated* (3)		
1851	89.1	96.8	99.0	112.7	79.1
1852	89.9	96.7	98.8	114.8	78.3
1853	97.7	105.1	106.2	118.4	82.5
1854	93.8	92.9	92.9	122.2	76.8
1855	95.3	91.6	90.8	120.6	79.0
1856	99.2	97.3	97.3	115.7	85.7
1857	104.7	99.7	98.8	116.8	89.6
1858	98.4	99.4	99.4	103.6	95.0
1859	96.8	96.8	95.8	102.1	94.8
1860	100.0	100.0	100.0	100.0	100.0
1861	98.3	97.3	99.3	99.5	98.8
1862	103.4	91.5	97.5	110.4	93.7
1863	110.1	79.2	87.4	136.8	80.4
1864	124.4	70.7	78.7	167.4	74.3
1865	137.8	78.7	85.6	170.0	81.1
1866	144.5	86.5	89.8	165.8	87.2
1867	147.1	93.7	94.9	156.7	93.9
1868	147.9	96.0	94.8	147.0	100.6
1869	151.3	102.9	102.9	147.6	102.5
1870	150.4	106.7	105.9	139.4	107.9
1871	152.1	112.7	110.2	132.6	114.7
1872	152.9	113.3	111.6	152.4	100.3
1873	155.5	116.9	114.3	145.3	107.0
1874	151.3	117.2	113.7	126.8	119.3
1875	144.5	117.5	112.9	104.8	137.9
1876	141.2	118.7	114.8	99.6	141.8
1877	133.6	113.2	108.6	101.5	131.6
1878	127.7	115.0	111.0	96.6	132.2

Sources: Col. (1): 1860-1878 from C. D. Long, *Wages and Earnings in the United States, 1860-1890* (New York: NBER, 1960), Table A-10, p. 152 and based on the *Aldrich Report*; 1851-1859 calculated directly from the *Aldrich Report*. Col. (2): Col. (1) deflated by Hoover's cost of living index in E. Hoover, "Retail Prices After 1850," in *Trends in the American Economy in the 19th Century* (Princeton: Princeton University Press, 1960) Table 1, p. 142. Col. (3): Col. (1) deflated by Hoover's cost of living index excluding clothing. Col. (4): McGouldrick's index of the cost of capital goods in cotton textiles from P. McGouldrick, *New England Textiles in the Nineteenth Century* (Cambridge: Harvard University Press, 1968), Table 46, pp. 240-41.

CONCLUSION

Since the appearance of Thomas Cochran's 1961 article,[38] the conventional assessment of the economic impact of the Civil War on the North has been under revisionist attack. Stanley Engerman's 1966 survey article appears to conclude that the economic impact of the Civil War has been grossly exaggerated.[39] The present paper has argued for a rejection of the revisionist position. The Civil War itself is not at issue, of course, since poor economic performance up to the end of the 1860's was to be expected and the Beards and Hacker had the subsequent years in mind anyway. We have tried to show that the Civil War did indeed induce a profound economic disequilibrium and much of the subsequent economic performance (including retardation) in the North can be interpreted as a gradual return to normality.[40] Although this position will hardly come as a surprise to those who have failed to be convinced by the revisionist arguments, the factors stressed in reaching this conclusion are not conventional ones. We have suggested that the source of disequilibrium can be traced to the way in which the Civil War was financed. In particular, we have asserted that economic historians should devote more of their attention to (1) long term debt management and (2) the impact of tariff policy on the relative price of capital goods. If our arguments are confirmed by future research, the implications for subsequent development in late nineteenth-century America are profound, and the Civil War well deserves the "watershed" label which economic historians have long reserved for it.

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[38] T. C. Cochran, "Did the Civil War Retard Industrialization?" *Mississippi Valley Historical Review,* XLVIII (September 1961), 197-210. See also D. T. Gilchrist and W. D. Lewis (eds.), *Economic Change in the Civil War Era* (Greenville: Eleutherien Mills-Hagley Foundation, 1965) and R. Andreano (ed.), *The Economic Impact of the Civil War.*

[39] Engerman, "The Economic Impact of the Civil War."

[40] The "gradual return to normality" is reflected by retardation in per capita GNP growth and a decline in capital formation rates even though investment shares are relatively stable up to 1900. See the author's "Late Nineteenth Century Retardation."