The United States economy completed its recovery from the Great Depression in 1942, restoring full-employment output in that year after 12 years of below-full-employment performance. Fiscal policies were not the most important factor in the 1933 through 1940 phase of the recovery, but they became the most important factor after 1940, when the recovery was less than half-complete. World War II fiscal policies were, then, instrumental in the overall restoration of full-employment performance.

What ended the Great Depression? In the traditional view, the answer is World War II, a conclusion that appears in the works of numerous economists and historians. The consensus has been that federal fiscal policies associated with the War brought the economy to potential output (that is, full-employment output), with monetary policies aiding the process by accommodating the fiscal stimulus.

Recently, the traditional view has been challenged. J. Bradford DeLong and Lawrence Summers estimate that more than five-sixths of the decline in output relative to trend that occurred during the Depression had been made up before 1942. They find it "hard to attribute any of the pre-1942 catch-up to the war." Christina Romer, whose calculations support their view that the recovery was essentially complete prior to 1942, also argues that fiscal policies "contributed almost nothing to the recovery before 1942." Romer, however, cites monetary developments as the crucial source of the pre-1942 recovery, and notes that the early stages of the war in Europe may have contributed to these developments after 1938 by stimulating an inflow of gold into the United States.

In this article, I take issue with DeLong and Summers and Romer by arguing that World War II fiscal policies were in fact a major contributor to the recovery from the Depression, not merely a topping-off of the recovery after it had been substantially completed. World War II fiscal policies were the most important factor in the recovery not only during

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1 See, for example, Stein, Fiscal Revolution, p. 170; Bernstein, Great Depression, p. 207; Vatter, U.S. Economy, p. 14; Lebergott, Americans, pp. 472, 477; Puth, American Economic History, pp. 521, 531-32; and Niemi Jr., U.S. Economic History, p. 390. See Higgs, "Wartime Prosperity?" p. 42, for a more extensive list of references on this point.


3 Romer, "What Ended the Great Depression?" pp. 761, 781.
TABLE 1

PERCENT OF RECOVERY IN REAL GNP ACCOMPLISHED

<table>
<thead>
<tr>
<th>Row</th>
<th>Projections</th>
<th>By 1940:4</th>
<th>By 1941:4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1923–1927 growth rate</td>
<td>46.0</td>
<td>86.7</td>
</tr>
<tr>
<td>2</td>
<td>1923–1927 trend</td>
<td>40.0</td>
<td>77.2</td>
</tr>
<tr>
<td>3</td>
<td>1929–1929 trend</td>
<td>40.8</td>
<td>78.7</td>
</tr>
<tr>
<td>4</td>
<td>1906–1929 trend</td>
<td>50.1</td>
<td>93.9</td>
</tr>
<tr>
<td>5</td>
<td>1919–1929 trend</td>
<td>30.1</td>
<td>62.5</td>
</tr>
</tbody>
</table>

Note: The 1940 and 1941 fourth-quarter figures for real GNP were calculated by deflating current-dollar figures with quarterly deflators interpolated between the annual GNP deflator values reported for 1940, 1941, and 1942.


1942, but during 1941 as well; and more than half of the recovery in output from its 1933 low point occurred during 1941 and 1942.

I begin the article by establishing that half or more of the recovery occurred during 1941 and 1942. I then discuss some measurement problems pertaining to that issue. Next, I present estimates showing that World War II fiscal policies had by 1941 become the most important factor in the recovery and detail the construction of those estimates. I then consider the contribution of monetary policies to the 1941 recovery. I conclude with a discussion of the role of fiscal policies in the 1933-through-1940 phase of the recovery.

THE PRE–1941 AND PRE–1942 RECOVERIES

Table 1 presents some estimates of the extent to which U.S. real GNP had recovered from its 1933 low point by the fourth quarters of 1940 and 1941, that is, the magnitudes of the pre-1941 and pre-1942 recoveries. For each period, I estimated the deficiency of actual real GNP relative to potential real GNP and calculated the percentage of the deficiency recouped through fourth quarters 1940 and 1941. For the row 1 figures, I replicated Romer's method of estimating potential real GNP by projecting the growth rate of real GNP during 1923 through 1927 forward through 1942. According to these calculations, in 1933, the low point of the Depression, actual output was 62.4 percent of potential real GNP, leaving a deficiency of 37.6 percent. By fourth quarter 1940, the deficiency had fallen to 20.3 percent, so that the percentage of the deficiency recouped was 46.0 percent; therefore, 54.0 percent of the recovery remained to be accomplished. By fourth quarter 1941, the recovery was only 13.3 percent short of completion.

Row 2 of Table 1 uses the Romer 1923-through-1927 year selection,
but estimates of potential output were obtained by projecting a logarithmic trend. Rows 3, 4, and 5 use the year segments employed by DeLong and Summers for estimating logarithmic trends for potential output, but the estimates in these rows relate to real GNP rather than DeLong and Summers's real GNP per working-age adult.\(^5\)

I imposed two criteria to choose among the several estimates. First, the projections should yield an estimate of potential real GNP for 1942 that closely approximates actual 1942 real GNP. Actual output should equal potential output when the economy experiences the natural rate of unemployment.\(^6\) According to the Bureau of Labor Statistics (BLS), the unemployment rate for 1942 was 4.7 percent, which closely approximates the natural rate of unemployment appropriate for that year. Robert J. Gordon, for example, estimated the natural rate of unemployment for 1942 at exactly 4.7 percent.\(^7\)

Second, the projections producing the estimates should yield a potential real GNP figure that presents 1929 as a year of slightly over full employment. The BLS unemployment rate for 1929 is 3.2 percent, a rate somewhat below the natural rate of unemployment appropriate to 1929.\(^8\)

By these criteria, the estimates of rows 1 and 3 of Table 1 are the best. Both project potential real GNP for 1942 at levels that are within 2 percent of actual 1942 real GNP, and both project potential real GNP figures for 1929 slightly below actual 1929 real GNP. Projections associated with the estimates in rows 2, 4, and 5 do not perform as well. They project either a potential real GNP for 1942 that varies more than 4 percent from actual 1942 real GNP (row 4) or a 1929 potential real GNP greater than actual 1929 real GNP (row 2), or they do both (row 5). Table 2, which presents the five potential real GNP projections for comparison with actual real GNP for 1929 through 1942, illustrates these points.\(^9\)

\(^5\) Table 2 presents the five potential real GNP projections. As is apparent there, the variations in method and time period result in slight differences in growth rates and slight differences in levels of potential real GNP relative to actual real GNP.

\(^6\) The natural rate of unemployment is the level consistent with labor market equilibrium, with inflation correctly anticipated.

\(^7\) Gordon, *Macrooeconomics*, pp. A2, A13. Gordon arrived at his estimates by taking the unemployment rate for late 1954, when he judged the economy to have been operating at the natural rate of unemployment, and adjusting that figure backward in time for changes in the self-employed percentage of the labor force. Darby has presented a corrected unemployment rate for 1942 of just 3.1 percent. However, a Darby-consistent natural rate of unemployment figure also would be lower than 4.7 percent, because a portion of the government relief workers that Darby treats as employed in obtaining his lower estimate would be part of natural unemployment in the BLS figures. See Darby, “Three-and-a-Half Million,” p. 8.


\(^9\) Two earlier efforts at estimating potential real GNP for this period should be mentioned. Brown took 1929 as well as 1942 as a full-employment year and interpolated potential output between the two years at a constant growth rate (3.15 percent per year). See Brown, “Fiscal Policy,” p. 869. Chandler projected potential real GNP forward from 1929 at a 3 percent annual growth rate, implicitly taking 1929 as a full-employment year, and produced a potential real GNP...
### POTENTIAL REAL GNP PROJECTIONS AND REAL GNP, 1929–1942

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>709.6</td>
<td>704.4</td>
<td>712.6</td>
<td>708.0</td>
<td>688.1</td>
<td>718.8</td>
</tr>
<tr>
<td>1930</td>
<td>642.8</td>
<td>726.9</td>
<td>737.2</td>
<td>732.3</td>
<td>709.8</td>
<td>742.6</td>
</tr>
<tr>
<td>1931</td>
<td>588.1</td>
<td>750.1</td>
<td>762.6</td>
<td>757.5</td>
<td>732.1</td>
<td>772.6</td>
</tr>
<tr>
<td>1932</td>
<td>509.2</td>
<td>774.1</td>
<td>788.9</td>
<td>783.6</td>
<td>755.2</td>
<td>803.7</td>
</tr>
<tr>
<td>1933</td>
<td>498.5</td>
<td>798.9</td>
<td>816.1</td>
<td>810.6</td>
<td>779.0</td>
<td>836.1</td>
</tr>
<tr>
<td>1934</td>
<td>536.7</td>
<td>824.4</td>
<td>844.3</td>
<td>838.5</td>
<td>803.5</td>
<td>869.9</td>
</tr>
<tr>
<td>1935</td>
<td>580.2</td>
<td>850.8</td>
<td>873.4</td>
<td>867.4</td>
<td>828.8</td>
<td>905.0</td>
</tr>
<tr>
<td>1936</td>
<td>662.2</td>
<td>878.0</td>
<td>903.5</td>
<td>897.2</td>
<td>854.9</td>
<td>941.5</td>
</tr>
<tr>
<td>1937</td>
<td>695.3</td>
<td>906.1</td>
<td>934.6</td>
<td>928.1</td>
<td>881.9</td>
<td>979.4</td>
</tr>
<tr>
<td>1938</td>
<td>664.2</td>
<td>935.1</td>
<td>966.9</td>
<td>960.0</td>
<td>909.6</td>
<td>1,019.0</td>
</tr>
<tr>
<td>1939</td>
<td>716.6</td>
<td>965.0</td>
<td>1,000.2</td>
<td>993.1</td>
<td>938.3</td>
<td>1,060.1</td>
</tr>
<tr>
<td>1940:4</td>
<td>803.3</td>
<td>1,007.7</td>
<td>1,047.9</td>
<td>1,040.4</td>
<td>979.2</td>
<td>1,119.3</td>
</tr>
<tr>
<td>1941:4</td>
<td>987.9</td>
<td>1,039.9</td>
<td>1,084.1</td>
<td>1,076.2</td>
<td>1,010.0</td>
<td>1,164.4</td>
</tr>
<tr>
<td>1942</td>
<td>1,080.3</td>
<td>1,060.6</td>
<td>1,107.3</td>
<td>1,099.2</td>
<td>1,029.8</td>
<td>1,193.6</td>
</tr>
</tbody>
</table>

Sources: See Table 1.

Based on the estimates in rows 1 and 3, the recovery was 78.7 to 86.7 percent complete by the end of 1941 but less than half-complete (40.8 to 46.0 complete) by the end of 1940. By the end of 1940, the recovery still had more than halfway to go.

These results make 1941 the crucial year for the question at hand. If World War II fiscal policies had become the most important factor in the recovery by 1941, their role in ending the Great Depression was much more than just finishing off a recovery already largely completed: they were the major factor in achieving the entire last half of the recovery. On the other hand, if they did not become the most important factor in completing the recovery until 1942, they were of only ancillary importance in accomplishing both the last half of the recovery and the recovery as a whole.\(^{10}\)

**MEASUREMENT PROBLEMS**

In an important recent paper, Robert Higgs raised some issues that bear on the foregoing analysis.\(^{11}\) Before moving to an assessment of the figure for 1942 short of actual 1942 real GNP by 3.5 percent. Chandler, *America’s Greatest Depression*, p. 4. Neither of these efforts meet both the tests applied here.

There has been no argument over the importance of federal fiscal policies to the recovery during 1942, when both federal purchases and the federal deficit soared. The increase in the federal deficit for 1942 was slightly larger than the increase in GNP for that year, when both are expressed in constant-dollar terms.

See Higgs, "Wartime Prosperity?"
contribution of fiscal policies to recovery during 1941, it is useful to consider these issues carefully.

Higgs’s major point is that World War II did not end the Great Depression in the sense of restoring economic well-being to its potential level, at least not during the war itself. Indeed, as he demonstrates, real consumption per capita was lower during 1942 through 1945 than during 1941.12

Higgs’s argument, although important, is not inconsistent with my analysis, as I locate the end of the Great Depression on the basis of the restoration of potential output. Potential output was reached in 1942 in the sense that, as I have already noted, the unemployment rate approximated the natural rate of unemployment. The 1942 unemployment rate was 4.7 percent for the civilian labor force and 4.4 percent for the labor force with the armed forces included.

More troubling are arguments by Higgs and Simon Kuznets that the Department of Commerce real GNP figures for the war years may be too high as a result of measurement problems.13 If the real GNP figure for 1942 is too high, then the potential output trends it certifies for columns 3 and 5 of Table 2 are brought into question, as are the associated Table 1 percentages of 1933 deficiencies recouped.

Higgs and Kuznets question the Commerce figures for two reasons. First, they ask whether federal expenditures for war product should be counted towards real GNP. Higgs presents several real GNP variants pertinent to this issue—a Kuznets series excluding nondurable war output (essentially pay and subsistence of the armed forces), a Kuznets variant excluding all war expenditures other than those for capital goods, and Higgs’s own variant excluding all government war expenditures.

In my view, the Commerce Department’s practice of including all war product in real GNP is valid for the analysis pursued in this article. Just as military personnel were considered usefully employed for computing the unemployment rate for the total labor force, government purchases of their services and of other war goods and services were product, product that was necessary for preserving the nation, its institutions, and its social fabric in the face of an external threat. Kuznets himself ultimately accepted this view as appropriate for the war years insofar as durable war goods were concerned.14

The second reason why Higgs and Kuznets felt that the Commerce Department’s real GNP figure may be too high is the argument that the price deflators used for the government expenditures for the munitions and war-construction category seriously understate wartime inflation.

12 Higgs’s figures were calculated using Friedman and Schwartz price deflators. For the deflators, see ibid., p. 52; and Friedman and Schwartz, Monetary Trends, p. 125.
Kuznets rejected the use of price deflators constructed from final-product prices for this category, regarding them as inaccurate for this very controlled sector of a controlled economy. Instead, he obtained deflators for the category on a cost-of-resources basis, adjusting them upward to fit his estimate that resource efficiency had declined by 20 percent for industries in this category by early 1943 as compared to resource efficiency in similar peacetime industries in 1939. His result was an aggregate real GNP estimate for 1942 that was about 88 percent of the Commerce figure. The difference rested entirely on the resource efficiency adjustment for munitions and war construction, for without it, his real GNP figure (including all war product) was slightly higher than the Commerce figure.  

I would argue that even if Kuznets is correct in applying his adjustment for resource efficiency, the Commerce figure for 1942 is still the appropriate one for certifying the potential output trends employed in this article. It is this figure that reflects what real GNP would have been in the full-employment year 1942 under peacetime resource efficiency conditions, and produces, therefore, a trend yielding the appropriate potential output observations for computing the percentage deficiencies of actual output in the key peacetime years 1933 and 1940. Retaining the Commerce Department's real GNP figure is convenient as well as conceptually sound, because it maintains consistency with the DeLong and Summers and Romer treatments. My differences with their conclusions over the portion of the recovery attributable to World War II fiscal policies do not depend on differences in data.

**RECOVERY DURING 1941**

Table 3, which apportions the increase in real GNP from 1940 to 1941 by major expenditure category, suggests that the question of the importance of federal fiscal policies to recovery during 1941 is worth investigating. The table indicates that 54.7 percent of the increase in real GNP for 1941 was accounted for by the increase in federal purchases of goods and services. The percentage accounted for by the increase in federal defense purchases was even larger, as nondefense federal purchases declined slightly.  

15 See Kuznets, *National Product in Wartime, Part II*, especially pp. 50, 52, 56, 57.  
16 That is, if Kuznets's lower real GNP figure for 1942 were accepted and employed, the Table 2 potential output values for the 1923–1927 growth rate and the 1892–1929 trend columns would be unchanged for 1929–1940:4. They would, however, display a lower growth rate after 1940:4 to reflect his estimate of lower resource efficiency during the war years. The associated Table 1 figures for percentages of recovery accomplished through 1940:4 would be unchanged, as would the inference that the recovery was less than half-complete by that date. Kuznets's resource-efficiency adjustment for the "peacetime" year 1940 was negligible.  
<table>
<thead>
<tr>
<th>Aggregate or Component</th>
<th>Change (billions of dollars)</th>
<th>Percent of Change in Real GNP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal consumption expenditures</td>
<td>4.5</td>
<td>28.0</td>
</tr>
<tr>
<td>Gross private domestic investment</td>
<td>3.8</td>
<td>23.6</td>
</tr>
<tr>
<td>Net exports</td>
<td>−0.6</td>
<td>−3.7</td>
</tr>
<tr>
<td>Government purchases of goods and services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Federal</td>
<td>8.8</td>
<td>54.7</td>
</tr>
<tr>
<td>State and local</td>
<td>−0.4</td>
<td>−2.5</td>
</tr>
<tr>
<td>Total real GNP</td>
<td>16.1</td>
<td>100.1</td>
</tr>
</tbody>
</table>


The figures in Table 3 are calculated in 1940 dollars in order to present the apportionment as accurately as possible. This was accomplished as follows. First, sectoral price deflators were taken from the 1986 edition of the *National Income and Product Accounts* for the smallest categories presented there.\(^{18}\) These were converted from a 1982 to a 1940 base year and used to deflate sectoral current-dollar figures for 1940 and 1941. The results were aggregated to 1940 dollar estimates of real GNP for 1940 and 1941 and the changes apportioned as in the table.

The fact that the increase in federal purchases was more than half of the increase in real GNP for 1941 does not in itself demonstrate that federal fiscal policies were the most important factor in the recovery for that year. Federal tax receipts increased as well, and that increase would have had an offsetting contractionary effect on aggregate demand. The net contribution of federal fiscal policies during 1941 would be the increase in federal purchases of goods and services, plus the multiplier effect of those purchases, less the contractionary effects on demand of the increase in federal net taxes (that is, the increase in federal taxes less the increase in the sum of federal transfers and federal interest payments).

The effect of the increase in federal purchases was much larger than the offsetting effect of the increase in net taxes, however. For one thing, the $8.8 billion increase in purchases was much greater than the $5.3 billion increase in net taxes: the federal deficit increased by 3.5 billion 1940 dollars. Moreover, increases in federal purchases would have had a much larger effect on aggregate demand than increases in net taxes, even had the two been equal in size. Purchases enter directly into aggregate demand, whereas increases in net taxes affect aggregate income accounts do not present separate price deflators or constant dollar figures for federal defense and nondefense purchases for 1940 and 1941.

\(^{18}\) Ibid., p. 327.
Table 4

CONTRIBUTION OF WORLD WAR II FISCAL POLICIES TO 1941 INCREASE
IN REAL GNP
(billions of 1940 dollars)

<table>
<thead>
<tr>
<th>Contribution of changes in:</th>
<th>1941</th>
<th>1940 Lagged</th>
<th>1940–1941 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal purchases of goods and services</td>
<td>13.7632</td>
<td>0.0495</td>
<td>13.8127</td>
</tr>
<tr>
<td>Net personal tax rate</td>
<td>-0.3331</td>
<td>-0.0734</td>
<td>-0.4065</td>
</tr>
<tr>
<td>Corporate tax rate</td>
<td>-0.0568</td>
<td>-0.1199</td>
<td>-0.1767</td>
</tr>
<tr>
<td>Excises and social insurance tax rate</td>
<td>-0.1135</td>
<td>-0.0267</td>
<td>-0.1402</td>
</tr>
<tr>
<td>Total contribution</td>
<td></td>
<td></td>
<td>13.0893</td>
</tr>
<tr>
<td>1941 Increase in real GNP</td>
<td></td>
<td></td>
<td>16.10</td>
</tr>
<tr>
<td>Contribution as percent of 1941 increase in real GNP</td>
<td></td>
<td></td>
<td>81.30</td>
</tr>
</tbody>
</table>

Sources: See the text.

demand indirectly through their impacts on disposable private income (personal taxes and transfers), the rental cost of capital (corporate profits taxes), and, in the short-term, prices (indirect business taxes and social insurance taxes paid by employers). Indeed, 69.1 percent of the 1941 increase in federal tax receipts was an increase in corporate profits taxes, whose impact on demand is relatively weak and builds up slowly. The remaining increase in federal tax receipts was apportioned 10.3 percent to personal tax and nontax payments plus employee social insurance contributions, 14.7 percent to indirect business taxes, and 5.9 percent to social insurance taxes paid by employers. Federal transfer and interest payments, including transfers to state and local governments, declined by 100 million dollars between 1940 and 1941.

Table 4 summarizes my estimate of the contribution of federal fiscal policies to recovery during 1941, taking these various factors into account. The table includes lagged effects of 1940 fiscal policies as well as same-year effects because World War II fiscal policies began affecting the U.S. economy in mid-1940.19

The estimate in Table 4 is necessarily an approximation, but the result is so strong that even sizable errors in the components would not materially affect the inference that federal fiscal policies were the most important factor in the recovery for the year. According to this estimate, fully 81.3 percent of the increase in real GNP for 1941 owed to federal fiscal policies.20 That leaves less than 20 percent for the net effects of current and lagged monetary policies, money-demand shifts, other exogenous expenditure shocks, supply shocks, and lagged effects of

20 If lagged impacts of fiscal policies from 1938 and 1939 are included, the estimated contribution of federal fiscal policies to the 1941 increase in real GNP is 83.6 percent, rather than 81.3 percent. However, the 1938 and 1939 policies were not World War II associated.
pre-1940 fiscal policies. The most striking feature of the estimate is that the offset from increases in net taxes is so small.

CONSTRUCTION OF THE 1941 ESTIMATE

To construct the estimate in Table 4, I first quantified the fiscal shocks that occurred during 1940 and 1941 and then transformed them to aggregate-demand and real GNP and real income impacts by adding estimated multiplier effects. The underlying model is one in which real GNP and real income respond to fluctuations in aggregate demand in the short term, with prices responding more gradually over time. The chief elements in the multiplier effects are income-induced effects on household spending that occur as real GNP and real household income begin to change.

For estimating the multiplier effects, sectoral multipliers were drawn from published simulation results for the 1960s version of the MPS model. These results were used rather than results from more recent versions of the model because the data base for estimating their parameters is much closer to the early 1940s in time. This procedure sacrifices re-estimations of the model that incorporate refinements suggested by recent research, but it appropriately avoids re-estimations that reflect merely the technological and institutional evolution of the economy during recent decades.

The MPS model simulations proceeded by adding hypothetical changes in federal purchases, taxes, interest rates, and so on, to the economy with the initial conditions of first quarter 1964 in order to obtain the differences by quarters between the real GNP with and without these changes. The multipliers implied by the simulations are compromised for the purposes of this article to the extent that conditions differed between 1941 and first quarter 1964. But these differences partially offset one another and are not critical. That the unemployment rate was higher in 1941 than in 1964 suggests that the true multipliers for 1941 might have been higher than those inferred from the 1964 simulations. On the other hand, the economy was beginning to shift from civilian to military production in 1941 (much more so than in 1964) and partly in consequence, the inflation rate was higher in 1941, suggesting that the true 1941 multipliers might have been lower.

The estimate in Table 4 neglects any purely expectations effects that

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22 For the more recent version of the MPS model, see U.S. Board of Governors of the Federal Reserve System, "Structure and Use."
23 The national income account data for the following discussion were taken from U.S. Department of Commerce, National Income and Product Accounts, 1929-82, except that, where needed for weighting, quarterly data were taken from U.S. Department of Commerce, National Income, 1951 Edition.
federal fiscal policies may have had on private demand, except to the extent that some of them might be built into the MPS tax multipliers. It is likely, however, that the net of neglected expectations effects would have been positive in 1940/41, when anticipations of war were strong, and would, if significant at all, have raised the estimate.

Federal Purchases of Goods and Services

The contribution of the 1941 increase in federal purchases of $13.7632 billion in column 1 of Table 4 was obtained by taking the increase in federal purchases of 8.8 billion 1940 dollars from Table 3 as an exogenous shock and multiplying it by an effective multiplier of 1.564. This multiplier was derived from the simulation data and weighted to reflect the fact that increases in federal purchases during 1941 were greater during the third and fourth quarters than during the first and second. For example, if the multiplier were estimated as the average of the cumulative multipliers for the first four quarters—in effect assuming that the 1941 increase was spread evenly over the year—the value would be 1.625.

Taxes

Exogenous federal tax increases occurred in three defense tax bills, enacted in June 1940, October 1940, and September 1941. The first two enactments occurred in 1940, but coming in June and October, they contributed to a rise in tax rates for both 1940 over 1939 and 1941 over 1940 (Table 5). Corporate profits and excess profits taxes were increased, excise taxes were raised (especially on gasoline), and tax rates for gifts, capital stock, and estates were increased. For the personal income tax, exemptions were lowered and tax rates were increased.

Net Personal Taxes

The increase in the net personal tax rate was treated as affecting aggregate demand through impacts on disposable personal income. Its effect was estimated by representing it as an exogenous change in lump-sum personal net taxes and multiplying by a lump-sum tax multiplier drawn from a simulation result from the 1960s version of the MPS model.

The lump-sum net personal tax change for 1941 was estimated as the

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24 See Board of Governors of the Federal Reserve System, “Channels of Monetary Policy,” table 4, p. 489, for the simulation data. If the 1940–1942 increases in the annual price deflators for government purchases were spread evenly over the 1941 quarters, the increases in real federal purchases, expressed in billions of 1940 dollars at seasonally adjusted annual rates, would have been 2.9, 1.8, 3.4, and 5.2, for quarters 1 through 4, respectively.

25 For a useful summary of major World War II federal actions involving purchases and other matters during 1939–1941, see Vatter, U.S. Economy, chap. 1, especially pp. 8–11.

26 For a description of the tax changes, see Studenski and Kroos, Financial History, 437–39.
TABLE 5  
REAL GNP, FISCAL AND MONETARY VARIABLES, AND THE BILL RATE, 1929–1942

<table>
<thead>
<tr>
<th>Year</th>
<th>$Y$</th>
<th>G$_{fed}$</th>
<th>$t_{np}$</th>
<th>$t_{c}$</th>
<th>$t_{e}$</th>
<th>$BR$</th>
<th>$ER$</th>
<th>$M_1$</th>
<th>$R_{tb}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>709.6</td>
<td>18.3</td>
<td>0.008</td>
<td>0.102</td>
<td>0.013</td>
<td>2.36</td>
<td>0.04</td>
<td>26.4</td>
<td>—</td>
</tr>
<tr>
<td>1930</td>
<td>642.8</td>
<td>20.6</td>
<td>0.007</td>
<td>0.111</td>
<td>0.012</td>
<td>2.38</td>
<td>0.06</td>
<td>25.4</td>
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</tr>
<tr>
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<td>21.2</td>
<td>−0.014</td>
<td>0.108</td>
<td>0.012</td>
<td>2.32</td>
<td>0.09</td>
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<td>1.40</td>
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<td>1932</td>
<td>509.2</td>
<td>21.9</td>
<td>−0.008</td>
<td>0.133</td>
<td>0.015</td>
<td>2.11</td>
<td>0.26</td>
<td>20.6</td>
<td>0.88</td>
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<td>1933</td>
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<td>27.0</td>
<td>0.000</td>
<td>0.142</td>
<td>0.029</td>
<td>2.34</td>
<td>0.53</td>
<td>19.4</td>
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<tr>
<td>1934</td>
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<td>34.7</td>
<td>0.004</td>
<td>0.139</td>
<td>0.034</td>
<td>3.68</td>
<td>1.56</td>
<td>21.5</td>
<td>0.26</td>
</tr>
<tr>
<td>1935</td>
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<td>34.1</td>
<td>0.007</td>
<td>0.142</td>
<td>0.030</td>
<td>5.00</td>
<td>2.47</td>
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<td>0.126</td>
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<td>2.51</td>
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<td>1937</td>
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<td>0.002</td>
<td>0.132</td>
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<td>6.83</td>
<td>1.22</td>
<td>30.3</td>
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<td>1938</td>
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<td>0.015</td>
<td>0.132</td>
<td>0.040</td>
<td>7.94</td>
<td>2.52</td>
<td>30.0</td>
<td>0.05</td>
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<td>0.007</td>
<td>0.140</td>
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<td>4.39</td>
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<td>772.9</td>
<td>63.6</td>
<td>0.009</td>
<td>0.228</td>
<td>0.040</td>
<td>13.25</td>
<td>6.33</td>
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<td>153.0</td>
<td>0.015</td>
<td>0.396</td>
<td>0.043</td>
<td>13.40</td>
<td>5.32</td>
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<td>0.13</td>
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<td>1,080.3</td>
<td>407.1</td>
<td>0.037</td>
<td>0.508</td>
<td>0.038</td>
<td>12.65</td>
<td>2.67</td>
<td>55.2</td>
<td>0.34</td>
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Notes and Sources: $Y$ is GNP in 1982 dollars, U.S. Department of Commerce, National Income and Product Accounts, 1986, p. 6; G$_{fed}$ is federal purchases of goods and services in 1982 dollars, ibid.; $t_{np}$ is the ratio of federal personal tax and nontax payments, plus personal contributions to federal social insurance, less federal personal transfer payments to personal income less federal personal transfer payments, ibid., p. 136; $t_{c}$ is the ratio of federal corporate income and excess profits taxes to corporate net income for returns with net income, U.S. Department of Commerce, Historical Statistics, 1960, p. 714; $t_{e}$ is the ratio of federal indirect business taxes plus employer federal social insurance contributions to GNP, U.S. Department of Commerce, National Income and Product Accounts, 1986, pp. 1, 36; $BR$ is the member-bank reserves, Board of Governors of the Federal Reserve System, Banking and Monetary Statistics, 1941–1970, p. 525; $ER$ is the excess reserves of member banks, Board of Governors of the Federal Reserve System, Banking and Monetary Statistics, 1941–1970, p. 525; $M_1$ is the money supply (demand deposits plus currency), Friedman and Schwartz, Monetary History, pp. 712–16, col. 7; and $R_{tb}$ is the three-months Treasury bill yield, U.S. Department of Commerce, Historical Statistics, 1960, p. 656.

change in the federal net personal tax rate from 1940 to 1941 multiplied by 1941 personal income net of federal transfer payments to persons, or as

$$(0.0149 - 0.0092) \times 88.4 = 0.5039 \text{ billion 1940 dollars.}$$

The net personal tax rates were calculated as ratios to personal income net of transfers of personal tax and nontax payments, plus social insurance contributions by employees, less federal transfers to persons.

The same-year multiplier for net personal taxes was estimated as $-0.6611$, which is the average of the cumulative multipliers for the first four quarters drawn from the MPS model. The simulation underlying the multiplier involved a lump-sum reduction in personal taxes of about $4.5$ billion (1.97 billion 1940 dollars), used to represent a cut in the personal tax rate of two percentage points. Because the simulation is for a tax rate decrease rather than an increase, its use assumed that the value is the same for either.

In sum, the contribution of the increase in the net personal tax rate for 1941 to the 1941 recovery, a negative contribution, was estimated as

$$(-0.6611) \times 0.5039 = -0.3331 \text{ billion 1940 dollars.}$$

The figure is recorded in column 1 of Table 4.

**Corporate Taxes**

Increases in the corporate income tax rate (profits and excess profits) were viewed as impacting on aggregate demand through rental cost of capital effects on business plant-and-equipment expenditures. Obtaining the estimate required several steps. First, to obtain the same-year impact, the change in the corporate tax rate from 1940 to 1941 was calculated as the change in the ratio of corporate federal tax payments to corporate profits for the two years, or

$$(0.396 - 0.228) = 0.168.$$  

Second, an estimate of the same-year elasticity of business plant-and-equipment expenditures with respect to the corporate Aaa bond rate was obtained from a simulation result of the 1960s version of the MPS model, a simulation involving an increase in the Aaa bond rate of one percentage point with income fixed. The estimate was $-0.0145$. Third, this elasticity estimate was combined with 1940 values for the corporate Aaa bond rate and plant-and-equipment expenditures to obtain an estimate of the direct impact in 1940 dollars on 1941 plant-and-equipment expenditures of a one percentage point increase in the corporate Aaa bond rate.

Fourth, this result was transformed to the direct impact (that is, income-fixed) of the 0.168 increase in the corporate tax rate from 1940 to 1941 by relating the effect of that tax rate increase to the effect of the 0.01 increase in the corporate Aaa bond rate, utilizing R. E. Hall and D. W. Jorgenson’s equation that relates both to the rental cost of capital. This procedure assumed that the response of plant-and-equipment expenditures to a given increase in the rental cost of capital would be the same whether the latter resulted from an interest rate increase or a tax rate increase. In the equation, the increase in the corporate income tax rate from 0.228 for 1940 to 0.396 for 1941 accounted for about 90.5 percent of the impact on the rental cost of capital of a one-percentage-point increase in the corporate Aaa bond rate, that is, an increase from 0.0284 for 1940 to 0.0384. The same-year direct impact estimate emerged as $-0.0383 \text{ billion 1940 dollars.}$

Finally, this direct impact was treated as an exogenous investment-expenditure shock and multiplied by an exogenous expenditures multi-

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28 See Board of Governors of the Federal Reserve System, "Federal Reserve-MIT Econometric Model," p. 21, for the simulation result.
plier inferred from an MPS model simulation to produce the same-year contribution to change in real GNP of $-0.0568$ entered in column 1 of Table 4. In obtaining the multiplier, I used the simulation for government purchases on the assumption that the investment-expenditures and government-purchases multipliers would be the same size. However, the effective multiplier was smaller (1.484), owing to heavier weights for the later quarters required by the less-rapid buildup of the direct impact on investment expenditures.

**Excises and Social Insurance Taxes**

I viewed increases in excise taxes and social insurance taxes paid by employers as impacting on aggregate demand through effects on prices of final goods and services. I treated them as short-term price shocks (supply-side effects) passed on to buyers as price increases. The impact of the 1941 shock on 1941 aggregate demand was calculated by combining the increase in the GNP price deflator necessary to accommodate it with an estimate of the same-year price elasticity of aggregate demand. The latter was obtained by taking the impact on real aggregate demand of an increase in real bank reserves from a simulation result of the MPS model and assuming that the effect would be the same whether it came chiefly from an increase in nominal bank reserves (as in the simulation) or a decrease in the price level.\(^3\)

The estimate of the change in the GNP deflator necessary to accommodate the increase in indirect business taxes and employer social insurance contributions was obtained as the increase in the ratio of those items to real GNP from 1940 to 1941 multiplied by the 1940 price-deflator value of 1.0, equal to 0.00319. Together with the estimate of the price elasticity of aggregate demand of $-0.3545$, it yielded the same-year contribution to aggregate demand of the price shock as

$$AD' = e(AD / P) P' = -0.1135 \text{ billion 1940 dollars},$$

where $AD'$ is the change in aggregate demand, $e$ is the price elasticity of aggregate demand, $AD = 100.4$ and $P = 1.0$ are the 1940 values for real GNP and the GNP price deflator in 1940 dollars, and $P'$ is the change in the GNP deflator required by the price shock. This result completes the entries in column 1 of Table 4.

The price elasticity estimate must be regarded as a rough approximation. Although it indicates a price-inelastic aggregate demand, it is, if anything, perhaps too generous, leading to an overestimate of the price shock effect. The elasticity is a short-term elasticity, and the excise tax increases were concentrated heavily in gasoline excises, where the short-term response to price increase probably was quite small.

\(^3\) Board of Governors of the Federal Reserve System, "Channels of Monetary Policy," table 4, p. 489.
Lagged Impacts of 1940 Fiscal Shocks

The lagged contribution of the 1940 fiscal shocks to the 1941 real GNP increase (column 2 of Table 4) was computed in the same manner as those for the 1941 shocks using incremental multipliers. For example, for net personal taxes, the incremental multiplier for the 1940 shock on 1941 demand was −0.4222, the difference between the cumulative multiplier figure for the second year of −1.0833 and the −0.6611 same-year multiplier. For government purchases, the incremental multiplier was 0.055.

The Small Offset from Taxes

The reason for the small negative contribution from tax increases is contained in the above figures. Most of the tax increase was in corporate profit taxes, where impacts emerge as fairly small, at least as compared to those of the increases in personal income taxes featured in textbook examples. The sensitivity of investment expenditures to the corporate bond rate is quite small in the MPS model simulations, and the impacts of the rather substantial increases in corporate tax rates that occurred during 1940 and 1941 each translate in the Hall-Jorgenson rental-cost-of-capital equation to less than that of a one-percentage-point increase in the corporate bond rate.

MONETARY POLICIES AND THE 1941 RECOVERY

Conceptually, the fiscal impacts in Table 4 occurred with no accommodation from monetary policies. The multipliers contributing to them were computed from MPS model simulations as the difference between what would have ensued with specified fiscal shocks and what did occur without them.

Since the estimate is that World War II fiscal policies accounted for 81.3 percent of the 1941 increase in real GNP, very little of the recovery is left to be explained by monetary policies and other factors. But if we compute a monetary policy impact in the same way as the fiscal impact, using an MPS model simulation, the prediction is that the lagged impacts of the substantial increases in member-bank reserves that occurred during 1938 through 1940 (Table 5) would have made a contribution to the 1941 increase in real GNP much larger than the 18.7 percent remainder.

The explanation for this puzzle is that the monetary impacts predicted by the model could not have occurred under the circumstances of the Great Depression, at least not through the mechanism the model incorporates. Increases in bank reserves operate in the model through impacts on the nominal Treasury three-months bill rate, spreading from there to other interest rates and interest sensitive expenditures. This process could not have operated during 1938 through 1941, because the
Treasury bill rate was already below 0.5 percent by 1934 (Table 5), too low to permit the declines of several percentage points necessary to the MPS mechanism.

Romer, who finds monetary developments to be the primary factor in the recovery from the Great Depression through 1941, handles this problem by arguing that the expansion of bank reserves created positive inflationary expectations, expectations that depressed perceived real interest rates sufficiently to provoke the necessary increases in interest-sensitive expenditures.  

However, whereas the increases in government purchases and taxes are concrete, and the multiplier effects reasonably so, the inflation expectations and real interest rate perceptions required for the monetary policy effects are speculative. It is more reasonable to view the World War II-associated fiscal policies as the primary stimulus for the 1941 recovery, with the sharp money supply increase during 1941 being mostly responsive and accommodative. As real GNP increased sharply during 1941 under the impact of the fiscal stimulus, the excess member-bank reserves accumulated during 1938 through 1940 were utilized and converted to bank credit and deposits, retarding the rise in the Treasury bill rate and ruling out the check to recovery that substantial increases in the bill rate might have posed. In effect, in the context of the Great Depression, with the bill rate at very low levels, the demand for excess reserves by banks (and hence the supply of money) was highly elastic with respect to that rate.

The question remains as to why the fiscal impact for 1941 in Table 4 is so much larger than Romer’s estimate. The main cause, I believe, is that Romer’s technique for obtaining multipliers produced a fiscal multiplier that is far too small. She picked two years, 1921 and 1938, when she perceived shocks other than monetary and fiscal policies to be negligible, and obtained monetary and fiscal multipliers by solving two equations relating the deviation of real GNP growth from normal for each year to the monetary and fiscal shocks of the preceding year. In the MPS model, the same-year impact of changes in government purchases is much larger than that of a lagged year, whereas the impact of changes in taxes accumulates more evenly over the same year and the first two lagged years; in fact, they are appreciably larger in the two lagged years for corporate income taxes. As a result, even if the assumption that no nonpolicy shocks impacted during 1921 and 1938 is acceptable, Romer’s multiplier likely misses most of the positive impact of government purchases but records much of the offsetting impact of taxes, greatly underestimating the absolute size of the fiscal multiplier. Romer does

31 Romer, “What Ended the Great Depression,” pp. 775–76. A disappearance of deflationary expectations might have contributed something to a decline in perceived real interest rates during 1939–1941. The consumer price index declined by 1.9 percent during 1937–1938 and by 1.4 percent during 1938–1939.
note that a government surplus multiplier obtained from the 1980s version of the MPS model is roughly ten times the size of the multiplier obtained by solving the two equations. But even this multiplier would not produce fiscal impacts equal to those of Table 4. The disparity may arise because Romer’s multiplier pertains to government-surplus shocks arising for government purchases only, whereas the 1941 case involved tax shocks as well. In the MPS model, the short-term effect on real GNP of a given reduction in the Federal surplus is greater when it results from the net effect of increases in government purchases and taxes rather than from the effect of an increase in government purchases alone, because the tax multipliers are weaker. In any event, when the fiscal multipliers and elasticities implicit in the 1960s version of the MPS model are applied individually to government purchases and major-category tax changes for 1940 and 1941 and the effects aggregated, the result is as in Table 4.

Although the essential argument of this article is that World War II-associated fiscal policies became the most important factor in economic recovery towards potential output in 1941 and that over half the recovery was accomplished in 1941 and 1942, it is interesting to inquire whether the MPS multiplier inferences used to document this argument can provide useful insights into the 1933 through 1940 phase of the recovery. Specifically, does it produce conclusions inconsistent with Romer’s view that monetary developments were much more important than fiscal policies during 1933 through 1940 and with the conclusions of E. Cary Brown and John Kirkwood that fiscal policies adequate to the recovery task were not tried? Brown found, for example, that the net contribution of the federal budget to aggregate demand was positive in all of the years 1930 through 1939; but it was significantly larger than the contribution in 1929 only for the years 1931 and 1936, and even in those years it was not dramatic.

The application of the MPS multiplier technique is limited by the fact that available simulation results encompass only three and sometimes four years, but that is enough to confirm that fiscal policies were not the most important factor in the recovery for any of the years 1930 through 1940 in which real GNP increased. The contribution of fiscal policy was largest in 1936, when, including same-year and lagged 1934 and 1935 effects, it accounted for 36.8 percent of the real GNP increase. For 1940, the figure is 17.7 percent, with lagged fiscal impacts from 1938 and 1939 included. Therefore, although the contribution of fiscal policies during 1933 through 1940 was larger than the “almost nothing” indicated by

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Romer, they were not the most important factor in the recovery prior to 1941. That essential point remains unscathed.

There is nothing in these findings to deny the Romer view that monetary developments were the primary stimulus during the 1933 through 1940 phase of the recovery. Substantial increases in bank reserves occurred during this period (Table 5). These could not have stimulated aggregate demand as specified in the MPS model, because of the low nominal interest rates, but they might have operated through sharp declines in real interest rates. It is pertinent to point out that such declines would not have required inflationary expectations, but merely the disappearance of deflationary expectations after prices ceased falling in 1934.

It should also be noted that monetary developments as a root cause of the 1933-through-1940 phase of the recovery need not have been limited to the workings of the real interest rate mechanism. The assumption of monetary leadership by the incoming Roosevelt Administration in 1933 was a monetary development, and it may have stimulated recovery by raising the confidence of the private sector independently of the bank reserve expansion. Such acts as the closing and reopening of the banks under the auspices of the Secretary of the Treasury in March of 1933, the institution of federal deposit insurance in the same year, and the several New Deal acts that restructured the Federal Reserve System and the securities industry may have caused wealthholders to be more willing to place their wealth in bank deposits and securities, bankers to be more willing to lend, and businesses and households to be more willing to borrow to spend—all at given perceived real interest rates. Whether we interpret these as interest rate effects, that is, as increases in expected yields adjusted for risk relative to borrowing costs, or as increases in investment and consumption expenditure functions for given perceived real interest rates unadjusted for risk is not crucial. They are still monetary effects. Of course, the nonfinancial aspects of the New Deal may have contributed something to enhance private-sector confidence as well.

Whatever the case, the essential point made in this section is that the direct-expenditures effects of Federal spending and tax policies were not the most important factor in the 1933 through 1940 phase of the recovery.

SUMMARY

Federal fiscal policies associated with World War II became the most important factor in the recovery beginning with 1941, when recovery from the 1933 low point in real GNP was still less than half-complete.

For Romer's view, see Romer, "What Ended the Great Depression," p. 781.
The analysis presented here attributes more than 80 percent of the 1941 increase in real GNP to World War II-associated federal fiscal policies. Thus, World War II fiscal policies did much more than simply complete a recovery already largely accomplished: they were, for more than half the recovery, the major determinant in the restoration of full-employment performance.

REFERENCES


U.S. Board of Governors of the Federal Reserve System, “Structure and Uses of the