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Discussion:
Three World Wars: Fiscal-Monetary Consequences
by George Hall and Thomas Sargent

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* Data and codes to reproduce figures in this comment are available at www.econ.umn.edu/~erm.
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I. Introduction

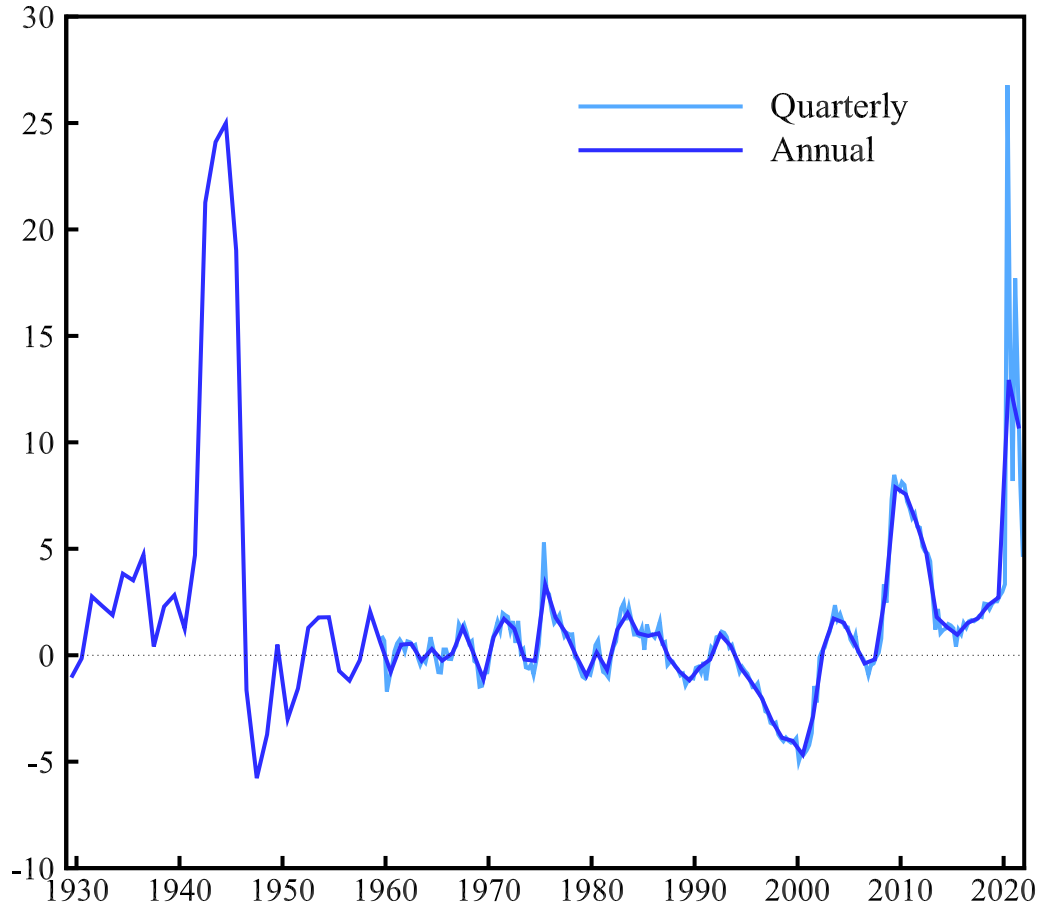
An important question in public finance is how best to finance unanticipated emergency government spending needs. The prime example is war financing, but recent experience has highlighted the fact that there are other kinds of emergencies that also necessitate large temporary increases in government spending. Hall and Sargent do not answer the question of how to do this optimally, but they do lay out a strong case that the COVID-19 experience shares many features with the two world wars of the 20th century.

In my discussion, I revisit two questions that are central to the paper. First, is a pandemic akin to battling a world war? I argue that there are some important differences that Hall and Sargent do not discuss that lead me to conclude that it is not like a world war. Second, who will pay? Like Hall and Sargent, I cannot answer this because only time will tell us. But, I will dig a little deeper into the “who,” namely, which taxpayers and bondholders that have been bearing the burden of U.S. public financing.

II. Is COVID-19 like a world war?

For many analyzing budgets of the U.S. government, Figure 1 is smoking gun evidence that the pandemic was a world war-like event. The figure shows the federal primary deficit—that is, the gap between federal spending and revenues, excluding interest payments—as a percent of gross domestic product (GDP). The source of the data shown here and later is the National Income and Product Accounts (NIPA) compiled by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). Included in NIPA are detailed government expenditures and receipts—both federal and state and local—compiled consistently back to 1929. (See NIPA Tables 3.1–3.3). In Figure 1, two lines are plotted: one for the annual data in dark blue and one for quarterly data in light

FIGURE 1. PRIMARY DEFICIT AS PERCENT OF GDP



blue. These lines are hard to distinguish until the end when quarterly spending increased mid-year 2020 and decreased mid-year 2021 at the same time that GDP fell.

There is no argument that government spending greatly exceeded receipts during the pandemic. After all, Figure 1 is simply a summary of NIPA data. However, in my view, this figure masks important differences between wars and pandemics. To address this, I will depart from Hall and Sargent in two ways. First, I will put greater focus on the spending needs during the world wars periods and the more recent pandemic period (2020–2021). Second, I will avoid dividing government budget items by U.S. GDP given there are large expansions during world wars and large contractions during pandemics. I will instead

analyze the budget constraint after dividing by the trend in U.S. GDP displayed in Figure 2. Figure 2 shows the historical real per capita GDP series over the period 1790-2021 that Hall and Sargent use in their analysis. I plot this on a log scale so that the fluctuations are visible. The second line in the graph is the time trend that I will use for detrending all historical time series. This trend is constructed by applying a very low-frequency filter.¹ Figure 3 shows the ratio of the two lines and gives a graphical sense of output fluctuations over much of the history of the United States. Not surprisingly, the prominent episodes are the Great Depression of the 1930s and World War II in the first half of the 1940s. Less prominent are World War I and the pandemic, which are of shorter duration.

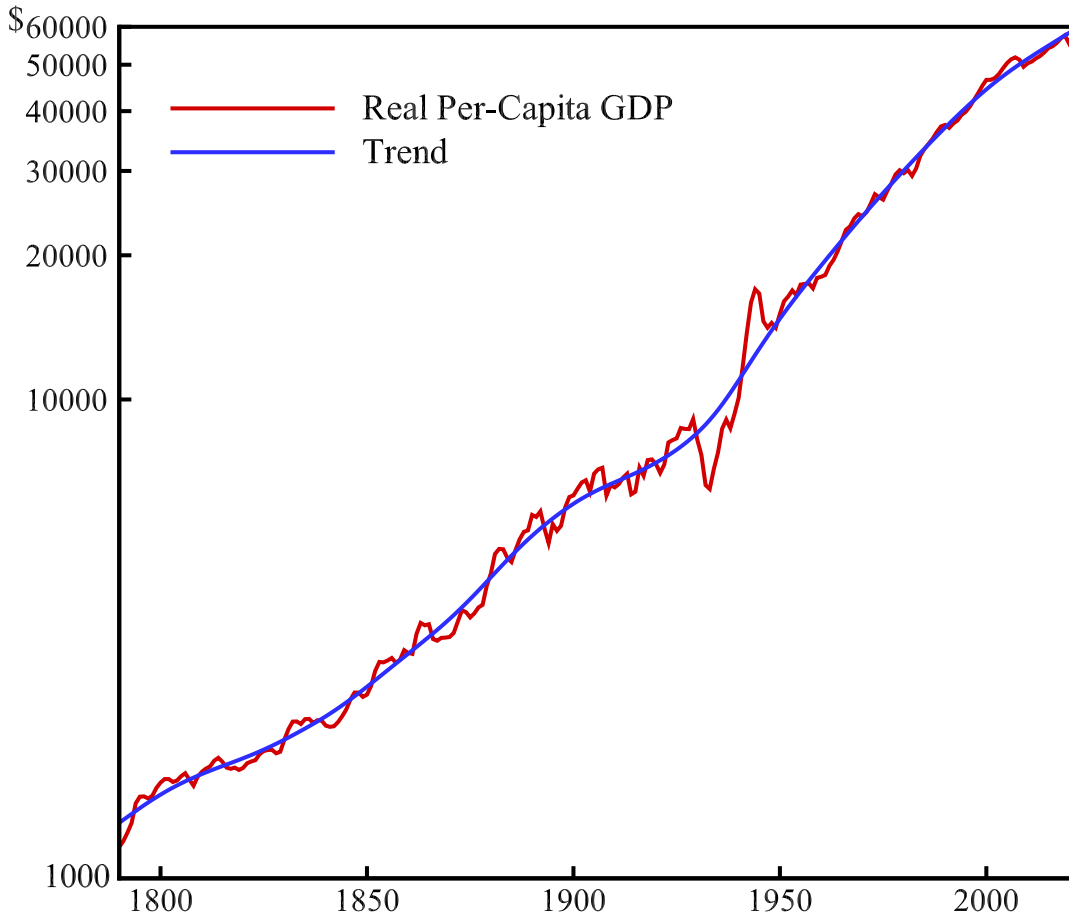
In Figure 4, I plot the detrended real per-capita GDP series from Figure 3 along with two measures of government spending over the period 1929–2021.² To construct the detrended real, per-capita spending measures, I first divide the relevant nominal spending series by the GDP deflator to get a measure of real spending. I then divide by the population (available in NIPA, Table 2.1). Finally, I divide the spending measures by the trend in Figure 1. The nominal series underlying “Government Spending on G&S” is the purchase of goods and services at the federal, state, and local levels. The nominal series underlying “Total Government Spending” is the total purchase of goods and services at all levels of government plus interest payments, current and capital transfers, and subsidies.

In Table 1, I reproduce the nominal BEA series from the NIPA tables that underly the spending series during World War II and break out items relevant to the war. The spending is shown in billions of U.S. dollars but can be easily converted to the deflated,

¹ I should note that the issues I raise below are not overturned by using alternative low-frequency filters.

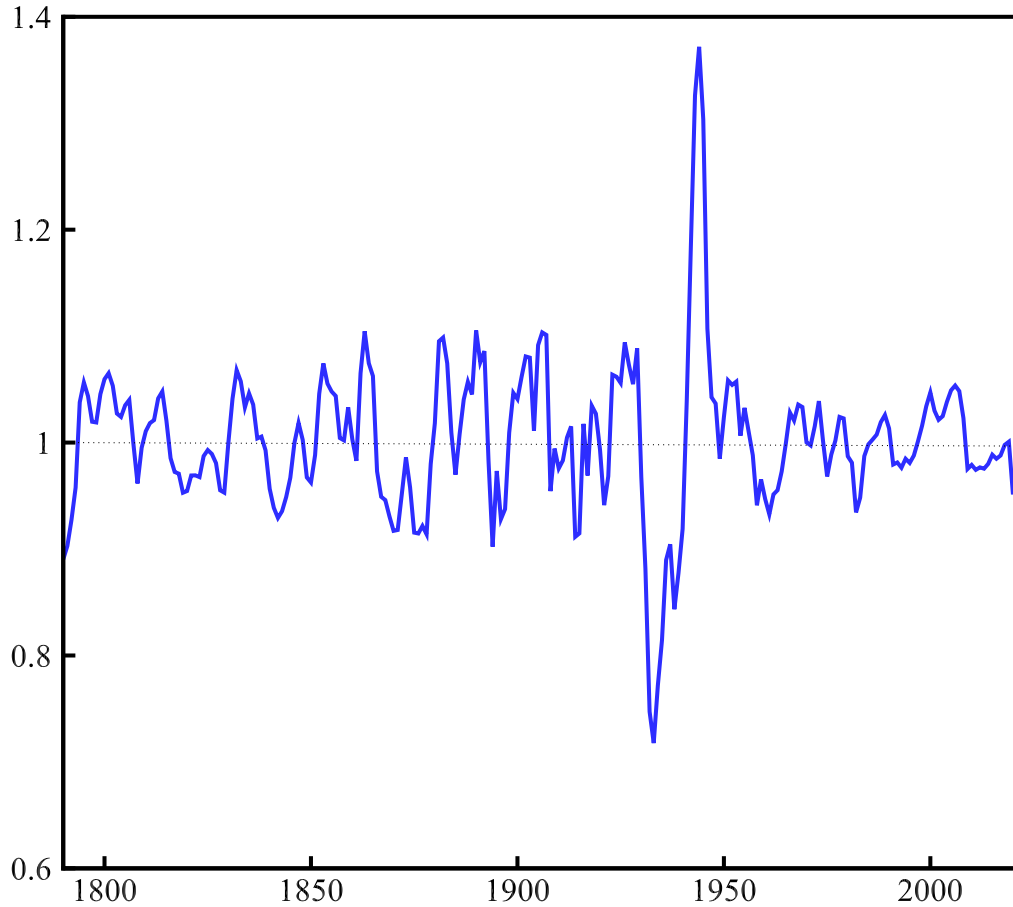
² Since the BEA data are revised regularly back to 1929, I compare only World War II with the Covid-19 “war.” Better measures of spending are needed to do the relevant comparison with World War I.

FIGURE 2. HISTORICAL REAL PER CAPITA GDP (2012 DOLLARS)



per-capita estimates used in Figure 4 (and later). For example, given the GDP deflator is equal to 9.5 percent at the peak of the war, we can convert the estimates into 2012 dollars by first dividing by the deflator and then dividing by the population of roughly 138 million to get an estimate for the per-capita real spending. In other words, the 116 billion dollar nominal total expenditures in 1944 is roughly equal to per-capita spending of \$8,800 in 2012 dollars and the 50 billion dollar nominal total receipts is equal to per-capita revenues to the government of \$3,800 in 2012 dollars. There are several noteworthy features of these spending measures. First, at the peak of the war, 86 percent of consumption expenditures and 96 percent of government investment expenditures were made on behalf of national

FIGURE 3. DETRENDED REAL PER CAPITA GDP (2012\$)



defense. Current transfer payments are a minor category of spending that start to grow steadily only after the war. Half of the 1946 estimate is transfers to veterans. Also growing throughout the war are net interest payments.

Figure 5 shows the major categories of spending—all detrended, real, and per capita. This figure gives a good sense of the history of government spending since 1929. Wars—including World War II, the Korean War, the Vietnam War—are times of elevated spending on goods and services. The pandemic is not. In Table 2, I reproduce the nominal BEA series from the NIPA tables that underly expenditure measures during the recent pandemic. As before, I report expenditures and receipts in billions of U.S. dollars and break out

TABLE 1. GOVERNMENT RECEIPTS AND EXPENDITURES, 1940-1946 (\$ BILLIONS)

	1940	1941	1942	1943	1944	1945	1946
TOTAL EXPENDITURES	20.5	32.4	70.5	103.6	115.9	107.6	62.4
Consumption expenditures	11.1	17.0	36.5	58.1	70.5	71.1	38.3
<i>Of which:</i>							
National defense	2.0	8.0	27.1	48.7	60.5	60.8	25.3
Current transfer payments	2.4	2.3	2.4	2.0	2.7	5.5	12.4
<i>Of which:</i>							
Veterans' benefits	0.5	0.5	0.5	0.5	0.9	2.8	5.3
Interest payments	1.7	1.8	2.1	2.9	3.6	4.5	5.6
Subsidies	0.7	0.5	0.5	0.6	1.0	1.1	1.4
Capital transfer payments	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gross government investment	4.4	10.8	29.0	39.9	38.2	25.3	4.7
<i>Of which:</i>							
Defense structures	0.6	3.6	10.3	5.8	2.5	1.7	0.3
Defense equipment	0.2	3.6	15.7	31.5	33.0	21.0	1.2
Defense IPP	0.0	0.2	0.4	0.7	1.3	1.3	1.2
TOTAL RECEIPTS	17.1	24.3	31.8	48.2	50.1	52.2	51.3
Current tax receipts	14.3	21.0	27.8	43.2	44.3	45.2	43.1
Contributions, social insurance	1.9	2.3	2.9	3.8	4.3	5.3	6.6
Income receipts on assets	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Current enterprise surplus	–	–	–	–	–	–	–
Current transfer receipts	0.3	0.3	0.4	0.5	0.6	0.7	0.5
Capital transfer receipts	0.5	0.5	0.6	0.6	0.7	0.8	0.9

Note: Total expenditures include consumption of fixed assets and exclude net purchases of nonproduced assets. Veteran's benefits include pension, disability, and life insurance. Subsidies and current surplus of government enterprises not shown separately prior to 1960.

categories relevant to the emergency spending. The last available data are from first quarter of 2022. In the case of the Coronavirus pandemic, there are twenty-two subcategories of spending listed that relate to different programs.

Programs that directly affect the accounting of government expenditures are included in four spending categories, namely, consumption expenditures, current transfer payments, subsidies, and capital transfer payments. One of the largest payouts of the Coronavirus

TABLE 2. GOVERNMENT RECEIPTS AND EXPENDITURES, 2019-2022Q1 (\$ BILLIONS)

	2019	2020	2021	2022Q1
TOTAL EXPENDITURES	7,874	9,746	10,051	8,827
Consumption expenditures	2,974	3,078	3,250	3,375
<i>Of which:</i>				
Paycheck Protection lender fees	–	18	17	0
Current transfer payments	3,157	4,266	4,620	3,919
<i>Of which:</i>				
Paycheck Protection, NPISH	–	41	13	0
Economic Impact Payments	–	276	572	0
Provider Relief Fund	–	89	60	114
Covid Relief Fund	–	150	246	1
Education Stabilization Fund	–	15	66	72
Lost Wages Supplement	–	36	1	0
Expansion of UI programs	–	395	293	3
Child Tax Credit	–	–	128	106
Increase in Medicare rates	–	10	14	15
Interest payments	890	829	807	845
Subsidies	73	761	493	150
<i>Of which:</i>				
Paycheck Protection, business loans	–	411	226	0
Provider Relief Fund for business	–	38	26	32
Coronavirus Food Assistance Program	–	20	6	1
Economic Injury Disaster Loans	–	20	7	2
Employees Retention Tax Credit	–	55	63	0
Tax credits to fund paid sick leave	–	105	8	0
Grants to air carriers	–	20	22	0
Restaurant Revitalization Fund	–	–	29	0
Support for public transit	–	15	14	20
Capital transfer payments	26	16	70	17
<i>Of which:</i>				
Emergency rental and homeowners	–	–	51	0
Gross government investment	740	782	802	825
Net purchases of nonproduced assets	14	14	9	–305

See notes at the end of the table.

Aid, Relief, and Security (CARES) Act was the Paycheck Protection Program (PPP), which provided forgivable loans for small businesses and nonprofit institutions in order

TABLE 2. GOVERNMENT RECEIPTS AND EXPENDITURES (CONT.)

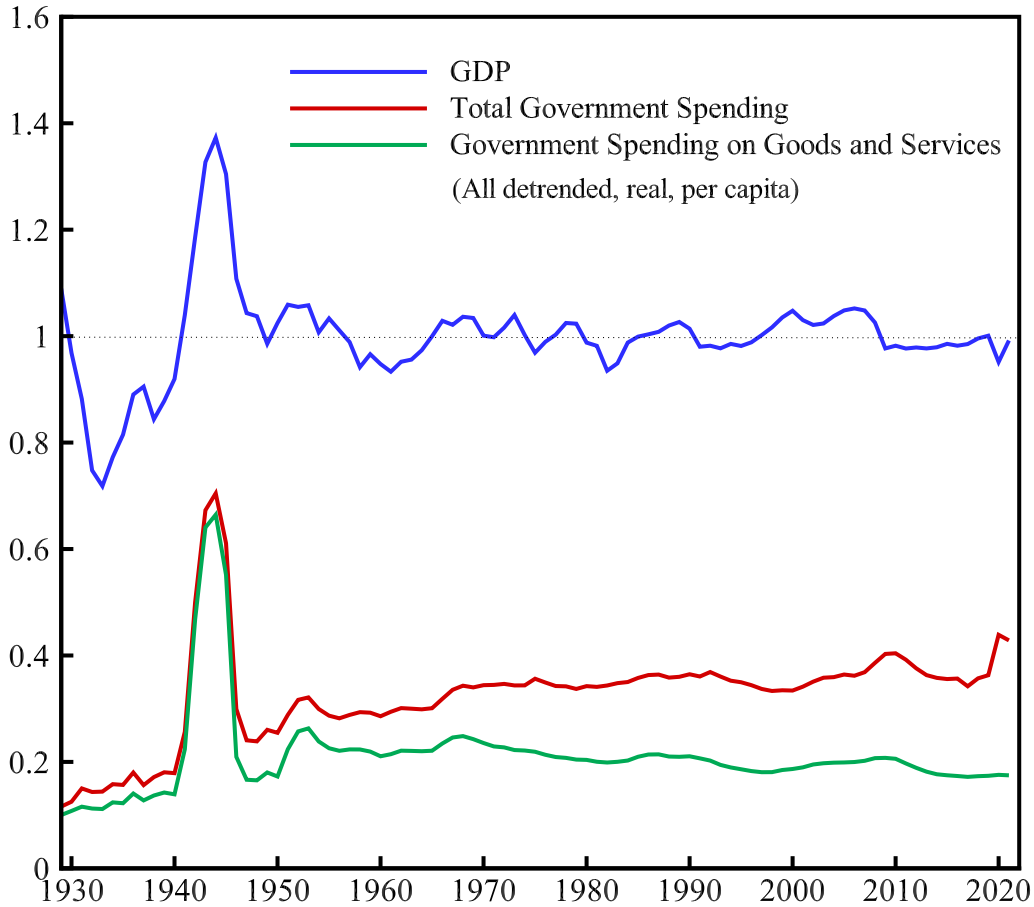
	2019	2020	2021	2022Q1
TOTAL RECEIPTS	5,919	5,926	6,691	7,424
Current tax receipts	4,055	4,021	4,623	5,217
<i>Of which:</i>				
Aviation Tax Holiday	–	–13	0	0
Contributions for social insurance	1,427	1,464	1,597	1,705
Income receipts on assets	207	216	236	269
<i>Of which:</i>				
Student Loan Forbearance	–	–30	–38	–38
Current surplus of govt enterprises	–13	–17	–13	–14
Current transfer receipts	223	216	215	214
Capital transfer receipts	22	26	32	33

Note. Total expenditures include consumption of fixed assets.

that they could cover their payroll and other expenses during the pandemic. These payments show up as transfers to nonprofits and subsidies to businesses. PPP payments were also made to lenders to administer the loans and show up as government consumption of financial services. According to BEA estimates, the total funding for PPP was \$726 billion dollars over two years.

Another large spending initiative under the CARES Act was the Economic Impact Payments, which provided direct payments to eligible individuals. These transfers totaled \$848 billion over two years. The Provider Relief Fund (PRF) has been supporting transfers and business subsidies—to date totaling \$359 billion—to hospitals and health care workers treating uninsured individuals. The Education Stabilization and Covid Relief Funds have provided \$397 and \$153, respectively, in grants-in-aid to states and local governments for schools and other local needs during the pandemic. A supplement of \$37 billion drawn from the Disaster Relief Fund was paid by the Federal Emergency Management Agency (FEMA)

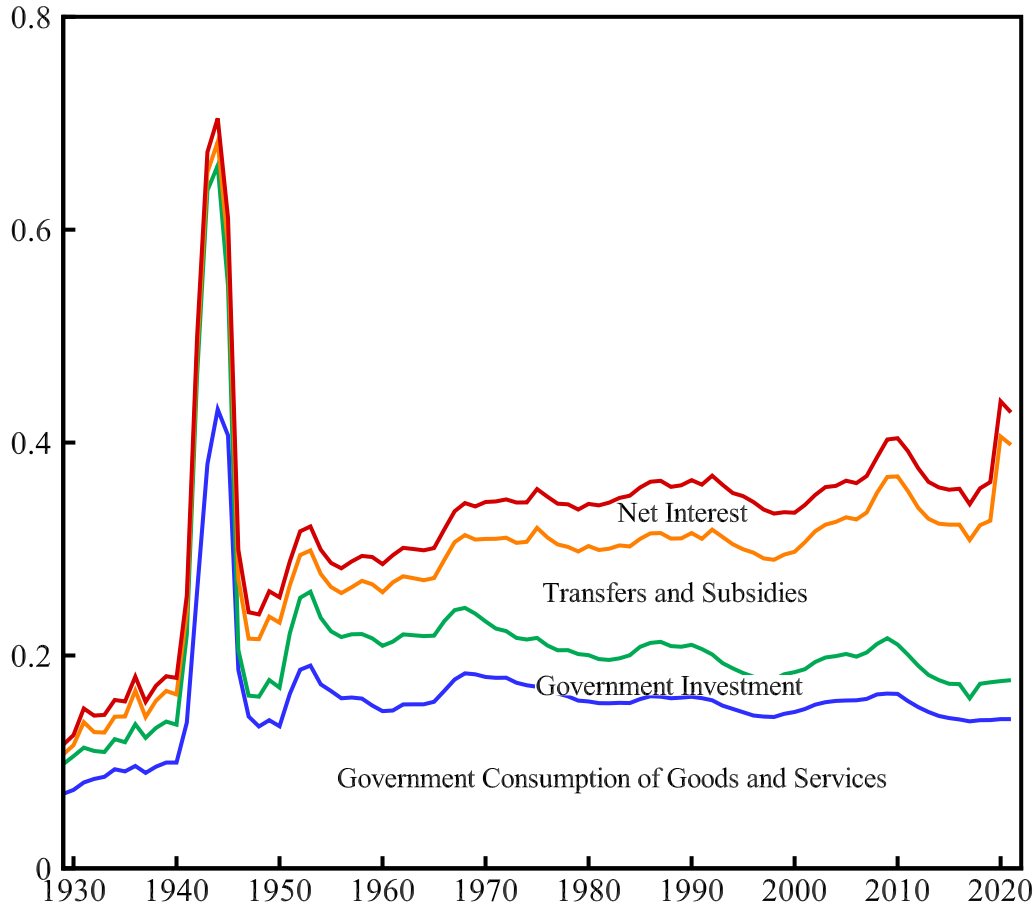
FIGURE 4. DETRENDED GDP AND SPENDING (2012\$)



for wages deemed “lost” in the pandemic. In addition to the new transfer programs, existing ones were expanded. There was an expansion of unemployment benefits and child tax credits, which increased current transfer payments. During 2021 and 2022:Q1, child tax credits were increased to \$3,600 per child for children under age 6 and \$3,000 per child between ages 6 and 17, which led to increases in current transfer payments. Reimbursement rates for Medicare service providers was also increased, which resulted in additional transfers of \$39 billion over the period reported.

In addition to PPP and PRF subsidies, other subsidies to businesses were granted during the pandemic. The Coronavirus Food Assistance Program provided \$27 billion in

FIGURE 5. DETRENDED SPENDING AND COMPONENTS (2012\$)



subsidies to farmers and ranchers impacted by supply chain disruptions. The Economic Injury Disaster Program provided \$29 billion in loans to small businesses and nonprofit organizations experiencing a temporary loss of revenue. Tax credits totaling \$231 billion were offered for employee retention and to fund sick leave.

There were also targeted subsidies in some sectors. Air carriers received grants totaling \$42 billion. The Restaurant Revitalization Fund provided \$29 billion in subsidies to owners of food and beverage-related industries including bars, restaurants, and their suppliers. The CARES Act provided \$25 billion to state and local transit agencies.

Pandemic-related programs also affected capital transfers in which payments are made for liabilities incurred for services in earlier periods. In this category, the BEA includes the Emergency Rental Assistance Program and the Homeowner Assistance Program both of which provided assistance for rental arrears and delinquent mortgage payments. To date, the government has spent \$51 billion on this program.

Given the remarkable number of programs initiated during 2020–2022, one can get lost in the weeds, and thus it helps to recap the clear message that the facts convey. The main spending of World War II was purchases of goods and services by the military. The spending was temporary—lasting four years. The main spending of the pandemic is in the form of new transfers and subsidies—to lots of different recipients—and expansions of some existing programs. Importantly, some of this spending will be hard to discontinue. Estimates in Table 2 will be updated as new data are compiled by the BEA.

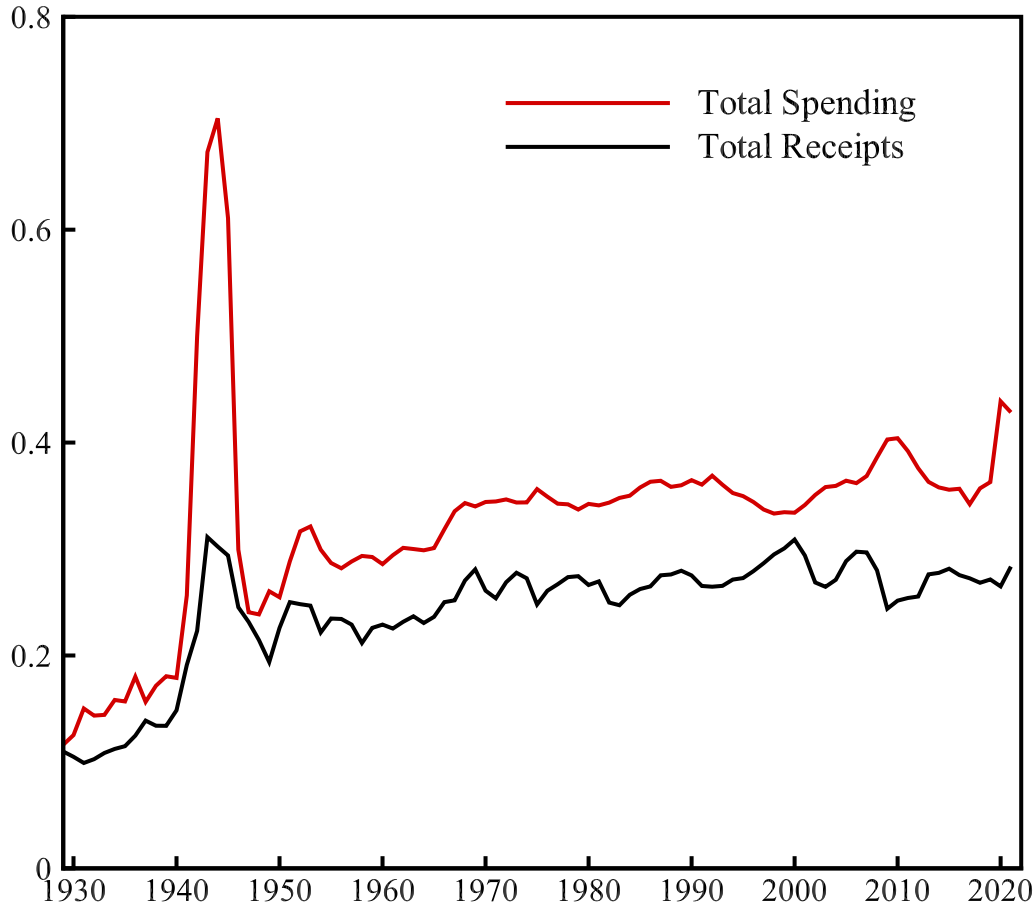
The more important data that has yet to be compiled is the eventual funding sources. I turn to this next.

III. Who will pay?

In Figure 6, I plot total spending and total receipts. With total spending, I include net interest payments and gross government investment.³ (See Tables 1 and 2 for the underlying BEA data during World War II and the recent pandemic.) As is clear from the figure and tables, there is a significant and persistent funding gap. The only emergency provisions are noted in Table 2, namely, the Aviation Tax Holiday, which lowered revenues by \$13 billion in 2020, and the Student Loan Forbearance, which suspended interest

³ If I instead were to include *net* government investment, then consumption of government fixed assets must be subtracted.

FIGURE 6. DETRENDED SPENDING AND RECEIPTS (2012\$)



payments on certain federally held student loans until August 2022. According to BEA estimates, the latter program costs roughly \$38 billion annually in lost revenue.

Figure 7 shows the history of total receipts, by funding source. The figure shows that individual income and corporate taxes rose considerably during World War II, but as Figure 6 makes clear, these tax receipts do not come close to funding the war. Sales and property taxes change little and, if anything, property taxes fall relative to trend during the 1940s and remain at that lower level after that. Over time, with corporations able to relocate production abroad and with a rise in pass-through business activity, the corporate

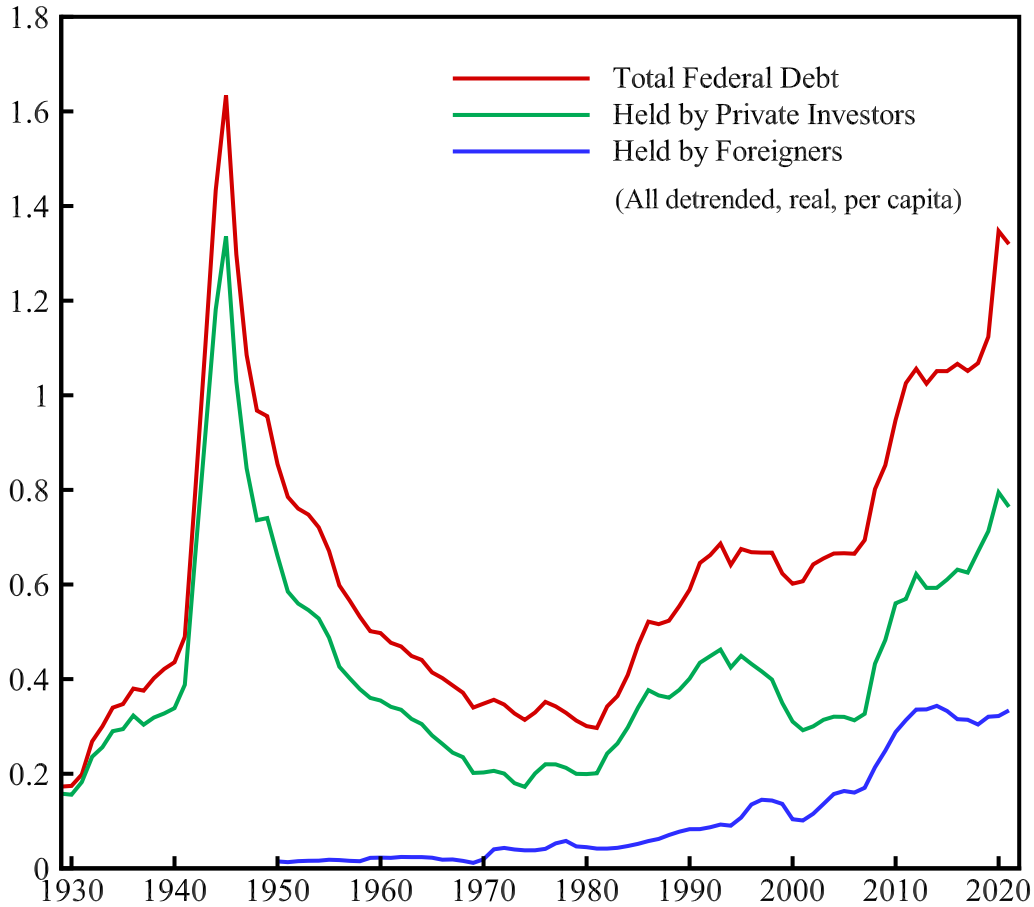
FIGURE 7. DETRENDED RECEIPTS AND COMPONENTS (2012\$)



income tax funding has diminished while individual income taxes have risen as a share of receipts. But, here again, the receipts are still far too low to cover the the spending.

As a result, federal debt levels have soared. In Figure 8, I plot total debt, debt held by private investors—both foreign and domestic—and debt held by foreigners. (The source of these data is the U.S. Treasury Bulletin.) All series are in real, per-capita terms and have been divided by the GDP trend level shown in Figures 1 and 2. A value of 1 here means a real, per-capita level of debt that is equal to real, per-capita GDP. The figure makes clear that while foreign holdings of U.S. debt have been rising over time, there is significant debt held domestically. Figure 9 provides a breakdown of these holdings. In

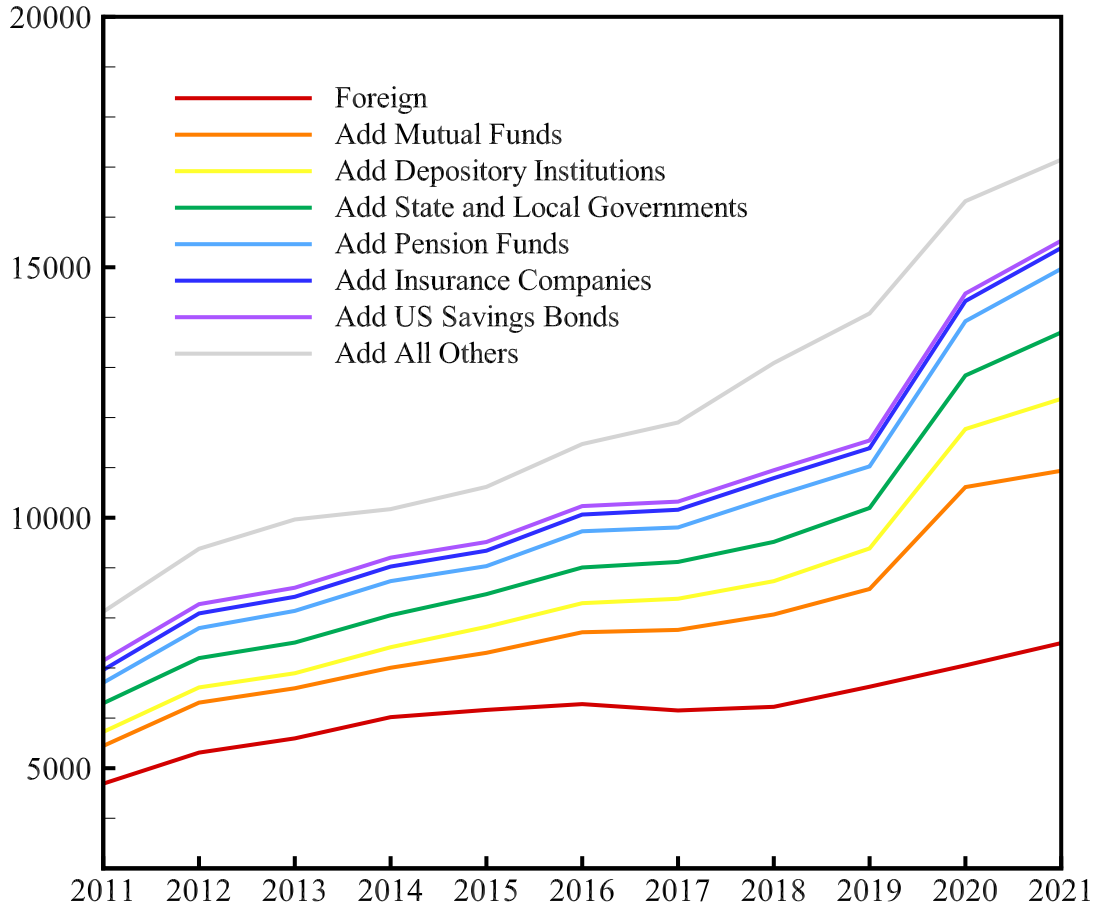
FIGURE 8. DETRENDED FEDERAL DEBT AND COMPONENTS (2012\$)



this case, the data are reported in trillions of dollars (without any detrending) over the period 2011–2021. The foreign holdings rise from a little under 5 trillion to 7.5 trillion. The net largest holder are mutual funds that held little in 2011 but grew to 3.5 trillion. Adding banks, governments, pension funds, and insurance companies and we have another 4.5 trillion in 2021.

Financing the pandemic spending through an effective default on the federal debt—say because inflation is now on the rise—will be difficult since so much debt is held domestically. Financing the pandemic with higher current taxes will be difficult given the “no new taxes”

FIGURE 9. CUMULATIVE HOLDINGS OF FEDERAL DEBT (CURRENT \$)



climate that has persisted for decades. That leaves the usual plan of action: ever increasing debt levels and higher taxation on future generations.

IV. Next Steps

An interesting next step of the Hall-Sargent research program is work out optimal tax policy responses in the case of a war and in the case of a pandemic. Given the different spending requirements, I would be interested to know if the policy prescription is the same, regardless of the type of crisis.