



Public Spending as an Engine of Growth and Equality: Lessons from World War II

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INTRODUCTION

The economic crises facing the world today are not economic in origin. Unlike past periods of collapsing credit, runaway inflation or financial bubbles, the threat to economic life today does not come from turbulence in the flows of money. In both the current coronavirus pandemic and the ongoing climate emergency, the problem begins with the natural world and our relation to it.

But, while these crises are not macroeconomic in origin, they have important macroeconomic dimensions. They involve extensive interruptions in normal economic activity — caused by lockdowns and social distancing today, and both by climate change itself and the shutting-down of carbon-intensive activities going forward. These will, without corrective action, reduce the incomes and spending of many households and businesses, adding an economic crisis to the underlying natural one. At the same time, dealing with the crises on their own terms — as the public health and environmental emergencies they are — will require a massive expansion of public spending. This spending will unavoidably have major effects on the broader economy.

In all these respects, today's economic problem is quite different from the economic challenges that have shaped the views of academics and policymakers, like the inflation of the 1970s and the great financial crisis of a decade ago. But it is not without precedent.

The World War II period offers, in some ways, a close parallel to the challenges facing us today. Then as now, the central question facing policymakers was not how to restore the normal functioning of the economic system, as it had been in the Great Depression and would be in most later crises. Rather, it was how to rapidly redirect production in specific new directions.

Just as in today's public-health and climate crises, the goal of wartime economic management was not to raise GDP in the abstract, but to drastically raise production of specific kinds of goods, many of

which had hardly figured in the prewar economy. Then as now, this rapid reorganization of the economy required a massive expansion of public spending, on a scale that had hardly been contemplated before the emergency. And then as, potentially, now, this massive expansion of public spending, while aimed at the immediate non-economic goal, had a decisive impact on long-standing economic problems of stagnation and inequality. Of course, there are many important differences between the two periods. But the similarities are sufficient to make it worth looking to the 1940s for economic lessons for today.

In this paper, we discuss the macroeconomic lessons of the World War II period for the response to the coronavirus and to climate change. We draw twelve lessons from the wartime experience and address them in two parts: lessons for public spending and economic growth, and lessons for labor markets and income distribution.

First, as discussed in part one, production can expand much more in response to demand than is usually believed. Macroeconomists normally assume that there is a level of potential output determined by “structural factors” like technology and demographics. In a downturn, boosting demand by increasing public spending can help return the economy to this potential level. But when the economy is already booming, more public spending will only crowd out private spending. During the war, however, the vast expansion of public spending on war industries came with almost no reduction in civilian spending. The resources for the vast war mobilization came almost entirely from an unprecedented rise in employment and productivity. Contrary to widespread impressions of the war years as a period of austerity for ordinary Americans, civilian living standards rose during the war. This is very important when looking forward to investment in decarbonization in a Green New Deal. While it is widely expected that green investment must come at the cost of living standards today, the war experience suggests that it may well be possible to find the resources for crash decarbonization in the economy’s untapped potential, rather than subtracting them from other needs.

At the same time, the vast expansion of output during the war did not come simply from increased spending. Mobilizing labor and resources and redirecting economic activity on the scale required by the war, required a much higher level of central coordination. Without a careful effort to schedule and coordinate military demands and to manage raw materials, the mobilization effort could easily have been frustrated by bottlenecks and shortages of key inputs. The planning effort during the war is a subject of a previous paper.

An important aspect of the response of output in response to demand is inflation. Textbook economics says that rising inflation is a sign that spending in the economy has exceeded its productive capacity, and the response must be to reduce total spending. But as economists like John Kenneth Galbraith argued during the war, inflation can also be understood in terms of price increases of specific inputs which are then passed on to a broader range of final goods prices. In this case, it may better be dealt with by price controls and rationing in the short run, combined with targeted investment to relieve those specific bottlenecks in the longer run. Treating constraints on the supply of specific — but critical— inputs as if they were constraints on the economy's overall productive potential would be a mistake. Galbraith's advice was largely followed during the war and has important applications today. For example, we must be careful not to mistake shortages of specific medical goods as indications of generalized supply constraints and seeing them as arguments against economic stimulus.

The second major macroeconomic lesson from the war, discussed in part two, concerns income distribution. The war years saw by far the greatest compression of incomes in US history. The share of income going to labor, to lower-paid workers, to women, to African Americans, to agricultural workers and to other disadvantaged or marginalized groups all rose sharply during the war. But surprisingly, given the great expansion of the government during the war, direct redistribution played little role in this equalization of incomes. The federal government did little to regulate labor markets, apart from attempting to limit wage increases - a policy that, on its own, tends to preserve existing inequalities. And while federal taxes rose greatly during the war, the distribution of these taxes actually became

less progressive. Instead, the entire redistribution of income took place as a result of the extremely tight labor market and resulting increase in bargaining power for workers. The war mobilization is testimony to the immense power of a “high-pressure” economy to improve the relative position of working people.

Applied to today’s debates, this aspect of the wartime experience suggests that the chronic weak demand the US has suffered from for at least the past decade is even more costly than we had realized. Not only does inadequate spending lead to slower growth, it leads to lower wage gains particularly for those at the bottom and reinforces hierarchies of race and sex. Conversely, a massive public investment program in decarbonization or public health would not only directly address those crises, but could also be an important step toward reversing the concentration of income and wealth that is one of the great failures of economic policymaking over the past generation. Efforts to improve the distribution of income will be greatly strengthened by a large public spending program that creates a tight labor market. Strong demand from whatever source will disproportionately benefit those at the back of the hiring queue, while conversely, the labor-market effects of a depressed economy may overwhelm any attempts at direct redistribution through taxes and transfers. In particular, the gap between median black and white wages close much more during the war years than in any subsequent period, despite the lack of effective anti-discrimination measures during the war.

The fact that the wartime boom disproportionately benefited Black workers does not, of course, diminish the importance of specific measures to promote a just transition away from carbon. It does, however, suggest that for addressing the racial wage gap and other persistent injustices in their US economy, a sustained period of extremely tight labor markets may be essential. Conversely, it also suggests that there is no conflict between the goals of massively increased spending on urgent public health and climate-change needs, and greater equity.

It is important to stress that the wartime experience is extreme, but it is not anomalous. The same economic processes that operate in normal times operated during the war, only pushed beyond their normal range. It is a puzzle why the war period gets so little attention in discussions of macroeconomics and economic policy; in other contexts, economists understand clearly that it is the extreme cases that are most informative. We are convinced that this is true of the war too.

PART ONE: WARTIME LESSONS FOR PUBLIC SPENDING AND ECONOMIC GROWTH

The war years saw the fastest economic growth ever experienced by the United States. As a result of the rapid growth in both employment and productivity, the country was able to ramp up military production to unprecedented levels while largely maintaining civilian output. To an extent that surprised many contemporary economists and policymakers, the US was able to have both more butter and more guns during the war years. Today, arguments that rapid decarbonization will impose major economic costs may similarly understate the economy's capacity to deliver higher output in response to stronger demand.

This rapid expansion did not just happen, though. The war mobilization required a massive expansion of the public sector. There was a proliferation of federal civilian and military agencies, as the federal government oversaw an unprecedented diversion of resources to the war effort. Labor and capital both poured into war production areas. By the end of the war some tens of millions of people had migrated, millions to work in war plants and in boom cities and others to man military hospitals, scientific laboratories, airfields, Victory ships, aircraft carriers, and foxholes. This unprecedented redirection of economic activity was possible only through an equally unprecedented expansion of government oversight and control, as discussed in our previous paper. Recognizing the need for a much bigger public role in the economy was the essential precondition for the expansion of output during the war. The form this expanded public role took is the subject of our previous paper.

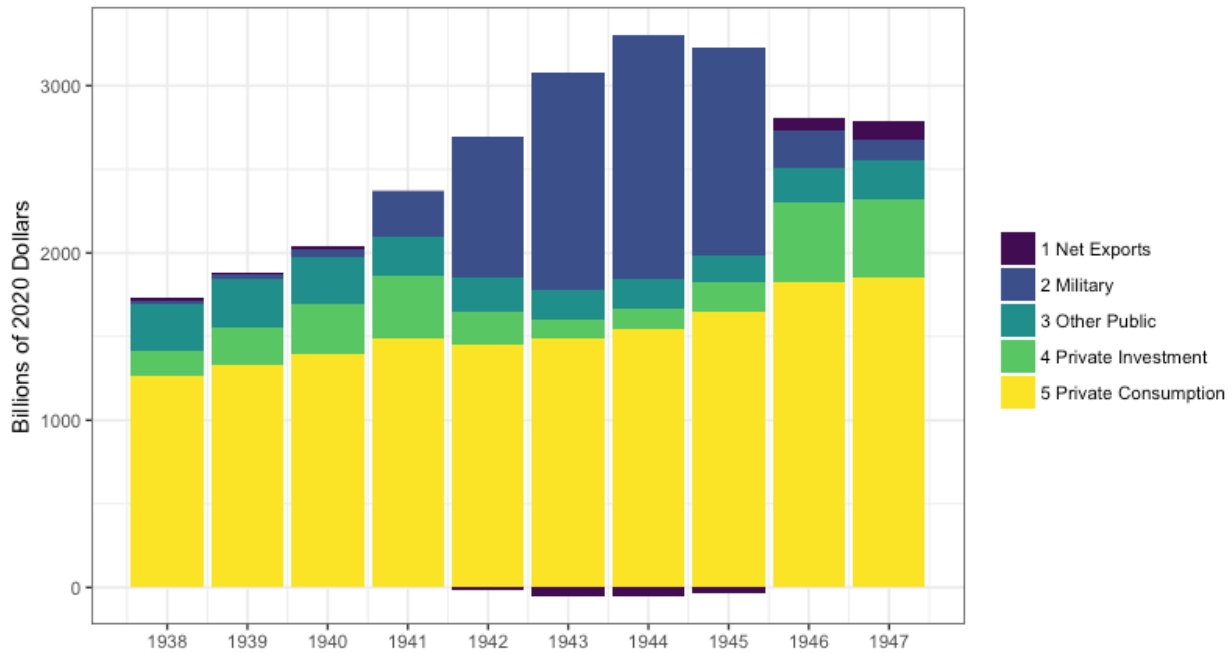
Military and civilian production during the war

The increase in military spending between 1940 and 1944 was equal to about 70 percent of 1940 GDP. The military authorities who demanded this vast expansion of military spending took for granted that much of it would be paid for by reduced spending on civilian needs. But contrary to prewar expectations, the enormous increase in military production came almost entirely from increased output; there was very little crowding out of civilian production. This is shown in Figure 1. From 1940 to its peak in 1944, annual military production increased by 80 percent of prewar GDP. The fall in real civilian production over this period was about 10 percent of prewar GDP, and almost all of this consisted of investment and non-military government output. Essentially none of the increase in military output came at the expense of production of goods for civilian consumption; the large majority of it represented new output brought forth by wartime demand.

If the war years are a guide, then, even the vast expansion of public investment required to address the climate emergency need not come at the expense of living standards. This is especially true since, as discussed in the second half of the paper, another lesson of the war years is that a massive expansion of public spending is likely to lead to a more equal distribution of income, even without any explicit redistributions.

LESSON ONE: The economy may have more potential for growth than we usually think; increased public investment need not crowd out private spending.

Figure 1: Military and civilian output, 1938-1947



The figure shows that while the growth in military spending (dark blue) between 1940 and 1945 was nearly equal to total pre-war GDP, essentially none of this came at the expense of civilian consumption (yellow), which saw a 10 percent real increase between 1941 and 1945. Source: Rockoff (1998), authors' analysis.

Figure 1 suggests that while the great bulk of military spending came from increased output, there was some modest crowding out of civilian production. But even the modest apparent decline from 1941 to 1944 overstates the amount of crowding out during the war. The decline in civilian production was mainly civilian investment; as can be seen in the figure and is discussed in the next section, civilian consumption continued to rise during the war. Meanwhile, a substantial fraction of the military spending is accounted for by the public investment for the war effort. (Public investment during the war is discussed in Bossie and Mason 2020.) Much of this investment could be and was repurposed for civilian purposes after the war. Indeed, acquiring ownership of these plants was a major priority for business leaders in the reconversion process at the end of the war. (Wilson, 2016) In 1947, for example, about half the nation's aluminum came from plants that had been built by the government during the war for aircraft production. This would be counted as military output in the data presented in Figure 1, but it increased the nation's postwar manufacturing capacity just as civilian investment would have. Once this is taken into account, it is not clear that there was any crowding out at all.

Indeed, by one estimate, in the late 1940s around a quarter of private manufacturing capital consisted of plant and equipment built by the government during the war and subsequently transferred to private business. Over the 20 year period 1929-1948, 40 percent of the total growth in private capital consisted of plant and equipment initially built and owned by the government. (Gordon 1969) This enormous transfer of productive assets from the public sector to the private sector must be weighed against the decline in private investment during the war. More broadly, it represented an immense and largely unacknowledged boost to private production, which may have played an important role in the postwar “golden age” of American capitalism.

A major lesson of the war, then, is that there may be much less conflict between dealing with urgent public problems like the coronavirus epidemic and climate change and maintaining private living standards than most people think. One reason for this, as the examples of wartime industries like aluminum, aircraft and synthetic rubber suggest, is that investment undertaken for public purposes often turns out to serve the needs of private production as well, if not better than, private investment.

This analysis comes with some caveats. There are major uncertainties around the measurement of inflation during the war years. And, obviously, the fact that consumption rose during the war, does not mean that it would not have risen even faster in its absence. If one takes the trend from the immediate prewar to the immediate postwar period as a baseline, then consumption does appear slightly depressed during 1942-1945. The question of whether consumption was higher or lower than it would have been in an alternate reality where the war did not take place is not really answerable. But that’s not the right question. What matters, and what is clearly the case, is that the vast majority of military production during the war did not come at the expense of civilian production.

The sources of wartime growth

How was the US able to increase output so rapidly during the mobilization effort? At the micro level, the public-sector planning and investment discussed in our previous report was clearly critical. At the

macro level, the explanation is a mix of rapid growth in the labor force and rising productivity.

Between 1939 and 1944, US GDP rose by nearly 80 percent. Rockoff (1998, p. 106) suggests the following very rough breakdown: 20 points from increased employment, 20 points from longer hours, 10 points from labor shifting from less to more productive sectors, 10 points from the growth in the capital stock, and 20 from overall increase in productivity. So, about half the growth in output came from increased labor input, and about half from increased labor productivity.

LESSON TWO: The size of the labor force may be more responsive to demand conditions than is often assumed.

Employment in the armed forces grew by about 10 million during this period, while war manufacturing and civilian government employment grew by a bit over 3 million. Thus, the war effort absorbed about 13 million new workers. Yet, surprisingly, essentially none of these workers were drawn from private non-agricultural employment, which was essentially flat over the war years. About five million of these new workers were drawn from the ranks of the unemployed (who had essentially vanished by 1944) and another eight million from increased labor force participation, especially of women. Somewhat under a million were drawn out of agriculture. (See table 1)

Table 1: Sources and Uses of Labor during World War Two

	1941	1944	Change
Total Nonagricultural Employed	42,800	56,600	13,800
War Manufacturing	6,571	8,301	1,730
Nonwar manufacturing	4,950	5,826	876
Government	6,222	17,426	11,204
Civilian	4,622	6,026	1,404
Military	1,600	11,400	9,800
Total Wartime Uses of Labor			13,810
	1941	1944	Change
Unemployed	5,560	670	-4,890
Extra Workers (April 1945)	8,130	0	-8,130
Women	4,230	0	-4,230
Men	3,900	0	-3,900
Farm Workers (1940 and 1945)	10,585	9,844	-741
Total Wartime Sources of Labor			-13,761

The table shows the growth in employment by sector during the war (uses) and the origins of the newly employed workers (sources). As the figure shows, less than half of the new wartime jobs were filled by previously unemployed or by workers drawn from other sectors; nearly two-thirds were new entrants to the labor force. Note: unemployed includes participants in the WPA and other forms of work relief.

That the majority of people entering the labor force during the war were not among those counted as unemployed has an important lesson for contemporary policy debates. The size of the labor force may be less of a fixed constraint, and more responsive to demand conditions, than is often supposed. A massive expansion of public spending on decarbonization might similarly lead to an increase in the labor force - especially given that US employment rates among prime-age adults are lower than in many other advanced countries. Conversely, if the coronavirus crisis is allowed to develop into a depression, this process might work the other way, with many of the unemployed dropping out of the labor force.

LESSON THREE: Massive public investment in new industries can lead to rapid productivity gains.

While the increase in employment explained about half the growth during the war, the other half came from increasing output per hour. By Rockoff's estimate, total factor productivity (increases in output for a given input of labor and capital) increased at a rate of nearly 3.5 percent during the war. This compares with an average rate of less than one percent in the decades after the war.¹ Productivity increases in many war industries were much faster. For example, in 1942 the aircraft industry produced at the fairly consistent rate of 3.2 worker hours per pound of airframe. At the start of 1943, the Aircraft Production Board predicted that could be reduced to 2.2 hours per pound. But by 1945, the industry was producing at a rate of 0.47 worker hours per airframe - labor productivity had risen by a factor of nearly seven in just three years. Productivity increases at individual plants were even more spectacular: The Willow Run bomber factory in Ypsilanti, Michigan went from producing 100 bombers a month in the spring of 1943 to 500 a month by the summer of 1944. (Peterson 2013, p. 235-236.) These "productivity miracles" suggest that where there are strong interdependencies between industries,

¹ There are major challenges in measuring and even defining total factor productivity. We will leave that aside for now.

the government may do a better job guiding productivity-boosting investment than the private sector. Contrary to the claim of Larry Summers that “the government is a crappy venture capitalist,” in a context of rapid, economy-wide change the government may be the best venture capitalist there is.² (Quoted in Tucker, 2019)

To be sure, the wartime gains in output were not all thanks to productivity-raising technological change. The longer hours and decreased unemployment of the war years are consistent with conventional accounts of how output responds to increased demand. These are finite resources which can be drawn on more intensely up to a point but doing so doesn't permanently raise the economy's productive potential. The other factors, however - representing more than half the wartime output increase in Rockoff's account — are permanent gains to the country's productive potential, which would not have occurred without wartime demand and planning. The new investment during the war, the new technology that was developed, and, not least, the elimination of barriers to women's employment in many sectors they had previously been excluded from, all represent lasting gains which left the country permanently richer after the war.

The war mobilization and increasing returns

One important implication of the rapid productivity gains in war industries is the possibility of widespread increasing returns. Contrary to a textbook model where each unit produced costs more than the last one, in increasing-returns industries each unit costs less to produce than the previous one. This means that higher demand can push costs down rather than up. This suggests that the costs of a rapid transition to carbon-free electricity generation, for example, might be much lower than a static analysis based on current costs would suggest. It also helps explain why government must play a central role in major economic transitions - new industries and technologies will often not be profitable for the private sector until they are already widely adopted.

² For another example of the wartime government's effective performance as a venture capitalist, see the synthetic rubber industry, discussed in Bossie and Mason 2020.

In a world of decreasing returns, large changes in production will be much more costly than small ones; as the economy shifts from fossil fuel to renewable energy, say, the first few windmills and solar farms will be cheap but adding more will get progressively more costly as necessary inputs become scarcer and more expensive. The wartime experience — like the experience of many new industries — suggests just the opposite: As you do more of something, it gets progressively cheaper. Whether we think of this as learning by doing, as economies of scale, or in other terms, the implication is the same: Big changes may actually be cheaper than small ones. It suggests that while adopting a new green technology — say, district cooling, or carbon capture in agriculture — may seem prohibitively expensive at first, it may become quite efficient if done on a large enough scale.

The fact that real world industries show increasing rather than diminishing returns, especially when new technologies are being adopted, is an important part of the argument for a leading role for the public sector. When wind power or solar photovoltaic technology were getting started, producing them was prohibitively expensive — just like the first runs of aircraft in the 1940s. Only a period of producing at a loss would allow for the experimentation and learning-by-doing that would eventually allow them to be commercially viable. But private business is rarely willing or able to shoulder the necessary losses to get over the hump — especially since the gains, when they come, will be broadly shared. Similarly, faced with a new pandemic or other public-health threat, medical interventions are likely to be very costly at first and to fall in cost as they are more widely adopted. Only with direct public spending to move down the cost curve can treatment or prevention become universal. In economists' terms, an increasing-returns world is one with multiple equilibria - an industry may not exist at all, or may exist at a large scale, but there is no viable position in between. In a world like this, public sector leadership is needed to get across the gap.

The economy of the 1940s is vastly different from today's. But the wartime experience remains critically important for thinking about decarbonization, because it is the best example we have of very large expansion in federal spending in a short period, combined with a major shift in the types of goods the economy was producing. The US has seen nothing remotely comparable since. So, despite

the distance in time, it still has important lessons for how the economy might respond to a massive demand shock today. A clear lesson is that the capacity of output to respond to demand may be much greater than is conventionally believed. Factors which are typically taken as given, like the size of the labor force and the rate of technological change, economic output may turn out to be quite flexible in response to a sufficiently large increase in spending, especially if increasing returns in key sectors means that costs fall, rather than rise, as output increases.

Civilian living standards during the war

At the start of the war, most people believed the Roosevelt administration's ambitious war production goals could be achieved, if at all, only at the cost of a massive reduction in living standards. Military leaders saw a fall in civilian consumption as inevitable, if not positively desirable. Many civilian planners and economists also expected the war to require a major fall in civilian living standards and were worried about how to manage it. In fact, however, despite rationing of a few key goods, the war saw a rapid rise in civilian living standards, with incomes and consumption quickly rising well above pre-war levels.

LESSON FOUR: Increased spending to address public needs does not require austerity and sacrifice by working people

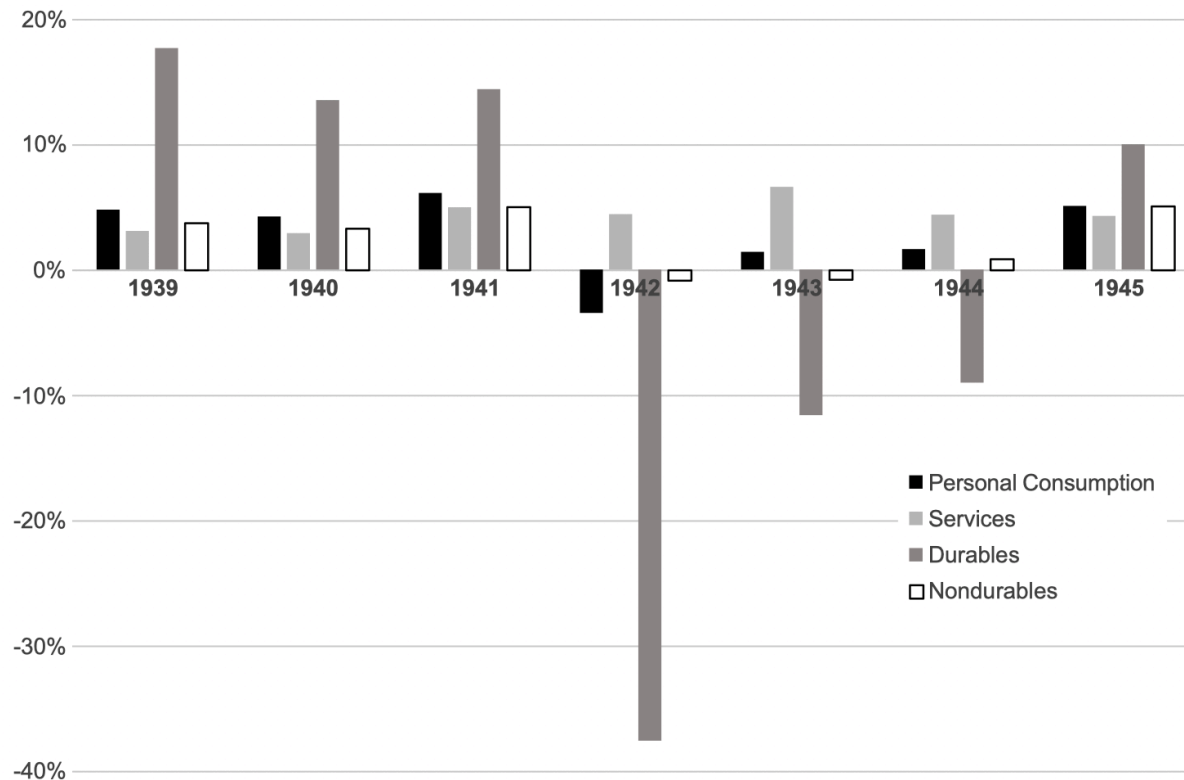
This experience is highly relevant for current debates about decarbonization. It is widely believed that rapidly phasing out fossil fuels will require economic austerity and lower living standards for most people. But the wartime precedent suggests that this need not be the case. War spending absorbed a large portion of GDP, but households in the US were not worse off as a result. Incomes and consumption increased substantially during the war. Household consumption remained above the 1940 level throughout the war (Rockoff, 1998). Conventional wisdom says that countries must choose between guns and butter, but during World War II the US enjoyed more of both. The historian John

Blum describes the rapid rise in civilian living standards during the war as a “carnival of consumption.”

For the great majority of American families, income rose even faster than consumption did. So not only did households benefit from higher living standards during the war, the accumulation of savings also allowed households to extrapolate that increase in consumption into the future. Thanks to the extremely strong labor markets of the war, most civilians were able to buy more than ever before, while still building up a financial cushion. “Full employment and prosperity ... permitted Americans, in spite of wartime restrictions, to begin to buy many of the necessities and some of the comforts they had been unable to afford for so long, and to dream about buying others once and end of war made those again available” (Blum 1976, p90)

Figure 2 gives a more detailed breakdown of the change in civilian consumption during the war. As the figure shows, while real civilian consumption rose in every wartime year except 1942, its composition shifted, away from consumer durables and toward services. Households largely ceased buying cars, but they took many more trips on public transit. This dimension of the wartime experience is relevant for contemporary debates about “green growth” vs “degrowth”. The example of the war years suggests that a curtailment of certain categories of consumption need not imply an overall fall in living standards. There is also a more specific lesson for decarbonization. Hard material constraints apply more to goods than to services, so precisely the kinds of shifts in consumption that are most necessary for decarbonization are those that are likely to relax supply constraints and allow overall living standards to continue to rise.

Figure 2: Annual Change in Real Per-Capita Consumption Spending, 1939-1945



Source: BEA Table 2.3.5; Census Annual population Estimates

LESSON FIVE: Reduced consumption of specific goods does not imply an overall fall in living standards

There were, of course, shortages of some goods, and many were rationed. Most striking from the graph is the steep fall in durable goods consumption (just under 13% of nominal consumption in 1941) after the US declared war on Germany and Japan. From 1941 to 1945 durables consumption fell by 50 percent. The complete shutdown of civilian car manufacturing is the often-cited example of the drying-up of durable consumption goods during the war. However, as the figure makes clear, the fall in consumption of new consumer durables does not reflect any broader deprivation in the civilian economy. Note that the heavy black bar, which shows total real private consumption, rises in every year except 1942. In addition, precisely because durables are durable, their purchase can easily be delayed, so the fall in new purchases does not imply an equivalent fall in living standards. Vatter

(1993) argues that the impact of the decline in durable goods products did not seriously affect the stock of durable goods until after the war when the aging durables goods stock was replaced slowly. The evaporation of new civilian automobile production during the war offers a useful example. Between 1941 and 1947 the number of cars 13 years or older more than doubled. As a percent of total consumption spending, transit, railway, and taxi transportation increased by more than 50 percent. (Vatter, 1993 Table 11.4) A similar shift could easily be imagined today, given sufficient investment in making transit an attractive alternative to private cars.

Rockoff (1998, Table 3.6) offers estimates of real personal consumption under different deflators. Generally, personal consumption peaks in 1942 and falls in 1943. However, real per capital personal consumption under all deflators was higher at the end of the war than when it began.

Creating a consistent set of numbers for average civilian consumption during the war is challenging because of the combination of large shifts in the mix of goods consumed, large changes in relative prices, and by price controls of varying effectiveness. We can avoid some of these problems if, instead of adding up dollars, we look at physical quantities of particular goods. For most nondurable categories, there is a clear increase during the war. Shoes, for example, were rationed, but civilians nonetheless bought about 5 percent more shoes annually in 1942-1944 than they had in 1941. Some food items were rationed, including sugar and coffee as well as meat. (Rockoff, 1984 p128). However, caloric intake during the war remained at or above the 1939 level throughout the war, as did purchases of many rationed goods. Civilian meat consumption increased by about 10 percent, from 142 pounds of meat per person in 1940 to 154 pounds per person in 1944. As it happens, butter seems to be one of the few categories of food where consumption declined during the war. Rockoff (1998) writes:

“Consumption of edible fats, particularly butter, was down somewhat during the war. Thus in a strict sense the United States did not have guns and butter. ... [But] ice cream consumption, which had been rising for a long time, continued to rise. Thus, the United States did have guns and ice cream.”

Wartime rationing, while extensive, was more a function of preserving specific crucial commodities than of general deprivation in the economy. The most famous example of rationing during the war was gasoline rationing; this was not however due to any shortage of gasoline, but was rather aimed at preserving tire rubber, a crucial material for the war effort that was in constant short supply.

Rationing in itself should not be seen as a sign of increased scarcity. It is, rather, an alternative to the price mechanism for the allocation of scarce goods. In the wartime setting, it was introduced where demand would exceed supply at current prices, and where higher prices were considered undesirable. In this sense, rationing is the flipside of price controls (discussed in the next section). Rationing can also be used to deliver a more equitable distribution than prices would — especially important with respect to necessities like food or shoes.

The fundamental reason why rationing was necessary in the wartime US was not that civilian production had fallen, but that civilian incomes were rising so rapidly. Civilian consumption may have been 5 percent higher in 1944 than in 1940; but aggregate civilian wages and salaries were 170 percent higher. Prices rose somewhat during the war years; but without price controls and rationing inflation would undoubtedly have been much higher. Rockoff's comment on meat probably applies to a wide range of civilian goods: "Wartime shortages ... were the result of large increases in demand combined with price controls, rather than decreases in supply."

The reader familiar with Robert Higgs' (1992) claims of declining household welfare during the war will notice we are presenting very similar quantitative evidence but reaching different conclusions. We concede the letter but not the spirit of his argument that the relatively slow growth in measured per capita consumption during the war is evidence of some civilian costs from the buildup of military spending. It is clear consumer purchases did fall during the all-out war phase, especially in 1943, relative to the pre-war defense period boom. This is not the relevant comparison, however, when discussing living standards for Americans after 10 years of depression. It is unambiguously the case that, while some consumer spending was crowded out after 1942, consumption was still higher than it was in the 1930s, and that most people experienced the war as a time of relative prosperity. More to

the point, the relevant question is not whether there was *any* crowding-out, but *how much* of the great expansion of wartime production came at the expense of civilian consumption. Here, there can be no dispute: The answer is, very little. For the much smaller — though still very large by non-WWII standards — increase in public spending under a Green New Deal or a crash investment in public health facilities, the war experience suggests that crowding out would be negligible.

A broader discussion of welfare during the war would need to account for factors other than consumption. Employment — especially with job security and union representation — is valued even apart from the consumption that wages pay for. Welfare also was enhanced by the rapid rise in household wealth during the war.

A comprehensive account of household welfare during the 1940s would also have to make some account of a war with over a million casualties for the US alone, and many millions more elsewhere. Fortunately, this aspect of the wartime experience is less relevant to current crises. On the contrary, in the face of climate change and pandemics, it would be a failure to raise public spending sufficiently that will be associated with increased suffering and death.

Inflation during the war

LESSON SIX: Rising inflation doesn't necessarily mean that the economy is producing at potential.

A standard view of capacity constraints is that, once they are reached, inflation will begin to rise, as households, businesses and governments attempt to buy more than the economy is able to produce. The only solution is to reduce total demand through some mix of higher taxes, lower government spending, and higher interest rates. The wartime experience challenges this view in two related ways. On the one hand, it became clear that inflation could start to rise well before the economy's labor and

capital was fully utilized, as a result of shortages of key inputs. And on the other hand, policymakers recognized that when inflation did develop, there were tools to deal with it other than simply reducing total demand.

Inflation did rise during the war. Influenced by Keynes, a number of contemporary economists saw tax increases as an appropriate response to rein in private spending and free up real resources for the war effort.

Today's mainstream similarly sees inflation as a sign that people are trying to buy more than the economy can produce. In this situation, either public spending needs to be brought down, or taxes or interest rates have to be raised to reduce private spending, until the total dollars flowing into production are equal to what the economy is actually capable of producing.³

There are, however, alternative perspectives on inflation. It may reflect limited supplies of specific raw materials or other inputs, for which no good substitutes exist. The prices of these inputs may start to rise even when there is substantial slack in other areas of the economy, and these price increases will in turn be passed on to those of final goods. In this perspective, inflation may reflect bottlenecks in specific sectors rather than a limited productive capacity in general. If this is the case, measures that reduce demand across the board, such as tax and interest rate increases, may not be the right response to inflation. Instead, the government should take steps to ration (in the short run) and raise supply of (in the longer run) the key inputs creating bottlenecks; in the meantime, it should adopt price controls to prevent higher input prices from leading to self-perpetuating spiral of price increases. This view was argued for by a number of economists in the Roosevelt administration, such as John Kenneth Galbraith, and is supported by the wartime experience.

³ Another perspective on inflation is that it reflects an excessive supply of money. While this view has, historically, been widely held among economists and others, it is not an important part of either wartime or current policy debates, so we do not discuss it here.

Figure 3 shows the official CPI estimates of inflation during the war years as well as the BEA's person consumption expenditure (PCE) deflator. We have also included estimates of the change in the price level from Rockoff (1984) based on the Mitchell committee findings and Friedman and Schwartz (1972) who construct a deflator based the net national product estimates of Kuznets⁴. As the figure shows, while there are substantial differences between the different estimates, they all agree on the broad pattern.

The rise in inflation even before the US entered the war was viewed as a serious problem by policymakers. Sharp price increases in bottleneck industries, most notably machine tools, had already begun to emerge in early 1941. In response, the Roosevelt administration formed the Office of Price Administration and Civilian Supply (OPA)⁵. The economist John Kenneth Galbraith was appointed to the Price Division of the OPA and he set about trying to organize price controls through voluntary arrangements and moral suasion; actual legal authority to set prices in various areas was gradually extended. For Galbraith, the work of the OPA was not just a response to wartime exigencies, but reflected a broader view of the inflationary process, in which prices might start to rise well before the economy had reached its maximum potential. In this view, if reductions in overall demand were the first response to inflation, that would mean putting a ceiling on demand while much of the economy's capital and labor was still un- or underutilized. As Galbraith put it, "a very considerable inflationary pull is necessary to achieve full employment." An implication of this view was that, outside of a few specific areas, reducing civilian production was neither necessary nor helpful to raising military production.

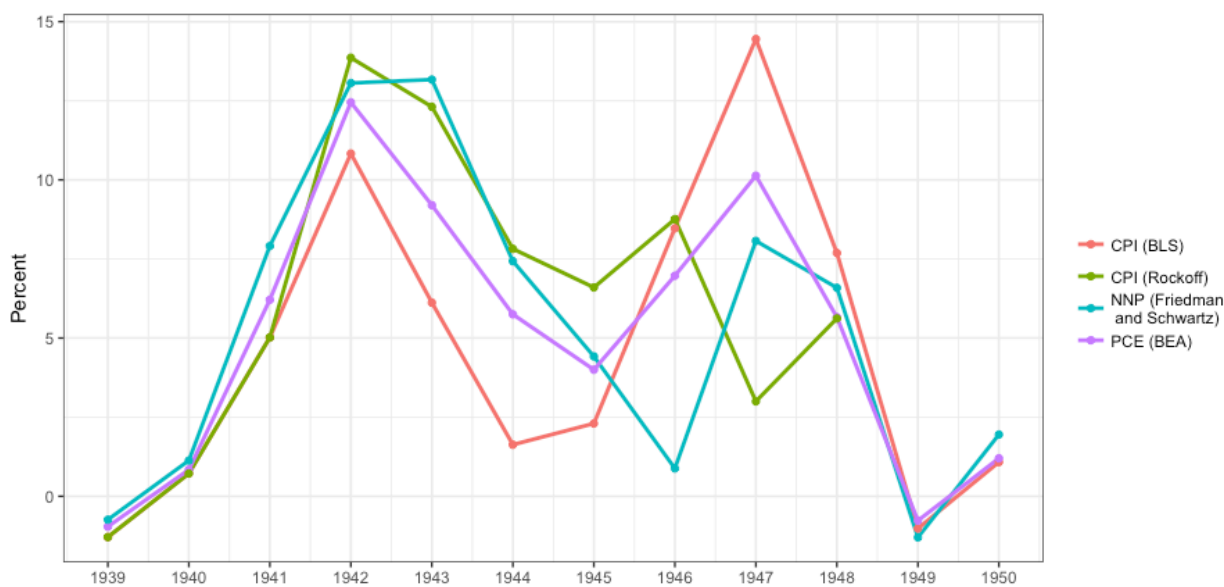
In May of 1942, under Galbraith's direction, the OPA introduced the General Maximum Price Regulation (GMPR, or General Max). This imposed across-the-board controls on prices at their level in March of 1942. As Figure 2 makes clear, there can be little question that the controls were effective. All price level estimates show a peak inflation in 1942 of over 10%, and a sharp decline in inflation once

⁴ For a detailed discussion of alternative WWII deflators see Appendix A of Bossie (2019a)

⁵ Unless otherwise noted this history of price controls is derived from Hugh Rockoff's definitive history of the American experience with price controls "Drastic Measures".

the more stringent Hold-The-Line controls came into force in 1943. The difference in the deflators stems from how effective the underlying assumptions are about the efficacy of price controls. The official CPI estimate shows a steep decline in inflation from almost 11% to 1.6% from 1942 to 1944. The other estimates show less effective control of inflation, but still show it cut roughly in half between 1942 and 1944. Wartime tax increases and price controls did not succeed in bring inflation back down to peacetime levels. However, they were adequate enough to stop a runaway price level spiral during the war; inflation, while high relative to either the prewar or postwar years, showed no signs of accelerating toward hyperinflation, despite the vast increase in demand during the war. What's more, once price controls were tightened, the inflation rate was reduced from its 1942 high, without any reduction in aggregate spending.

Figure 3: Consumer price inflation 1939-1950, alternative estimates



While measuring inflation during the war years is challenging, the figure shows that even measures that try to correct for rationing and black-market prices find a sharp drop in inflation after broad price controls were imposed. Source: Bossie 2019b

LESSON SEVEN: If prices are rising because of bottlenecks in specific sectors, the solution is price controls and central allocation in the short run, and measures to increase supply in the long run - not reducing overall demand, through higher taxes or interest rates.

The war years offered important corrective to the idea that there is a direct link between the output gap and inflation. Contrary to today's textbook orthodoxy, the wartime experience suggests that reducing total spending is neither a necessary nor sufficient response to rising inflation. Indeed, fully mobilizing the economy's productive potential may require overshooting price stability, at least temporarily. While the idea of a tradeoff between unemployment and inflation has become deeply unfashionable among economists, under wartime conditions it may be more reasonable. An annual inflation rate of 7-8 percent, over the course of a few years in this view, may be an acceptable price for an economy where output was pushed so far above previous ideas of potential, generating productivity gains that were largely maintained after the war.

The bottom line here is that while wartime inflation was recognized as a problem that needed to be addressed, it was not taken as a sign that the absolute physical limits of output had been reached. Economists like Galbraith, in line with modern ideas about hysteresis, believed that limiting demand to the level consistent with price stability would mean leaving large amounts of potential labor idle.

This will be a very important point to keep in mind if decarbonization spending eventually leads to a rise in prices, particularly if that rise is centered on specific green-economy inputs in limited supply. This lesson of the war years may also be relevant in the near future, if some medical and health-related goods and services rise sharply in price, or if specific goods see shortages due to COVID-related breakdowns in the supply chain. These problems need to be dealt with price controls and perhaps rationing in the short run, and by targeted investment in the longer run. It would be a grave mistake to see them as evidence of economy-wide supply constraints, or as an argument against further stimulus spending.

PART TWO: WARTIME LESSONS FOR LABOR MARKETS AND INCOME DISTRIBUTION

The war years saw the greatest leveling of incomes in US history. In just four years, the share of income going to the top 1 percent fell by fully a third, from 15.7 to 10.5 percent. The share going to the top 10 percent fell by a similar proportion, from 45 percent to 30 percent. While there was a modest further fall in the top income shares in the 25 years after the war, most of the 20th century's "great compression" of incomes took place during the five years 1940 to 1945.

The winners from the great compression were widely distributed. While wages of course rose in war industries, they rose even faster in low-wage sectors like agriculture, textiles, and food preparation that were not directly involved in the war effort. For both women and Black workers, the war saw both a substantial closing of the wage gap with white men, and entry to a broad range of occupations that had previously been barred to them. Apart from emancipation and Reconstruction, no other period in American history rivals the war years for rapid movement toward economic equality.

Yet surprisingly, this great equalization happened with little direct government action toward redistribution. It was not new laws or regulations but the extremely tight labor markets of the war that empowered workers to demand higher wages, and that compelled employers to offer positions to Black and female workers that they would never previously have considered. Income taxes rose sharply during the war, but unlike the prewar income tax, which was paid only by the richest households, the burden of wartime income taxes fell mainly on those lower down the income scale. Labor market policy was quite limited; the main policy was an across-the-board wage freeze, which tended to maintain existing wage

differentials. But the sheer weight of military demand had a sufficiently powerful to overcome the lack of direct interventions on behalf of labor or specific marginalized groups. For Black workers in particular, the war years saw substantial gains relative to white workers; but on the other hand, there was no serious challenge to entrenched white supremacy in the workplace.

None of this should be taken to imply that active measures to promote economic justice should not be part of the response to climate change, the coronavirus emergencies, or other major expansions of public spending. On the contrary, the failure to address racial justice was a major failure of the war mobilization; and while the war did see consolidation of the labor movement, many labor leaders were disappointed that it did nothing to challenge the power of employers in the workplace, and that wartime public investment and economic management did not set the stage for any lasting reorganization of the economy to meet human needs. In these respects, a Green New Deal must go beyond the war mobilization.

Still, there is a powerful positive message on economic justice from the wartime experience. What the war shows is that a high-pressure economy, by itself, is a very powerful instrument for redistribution. Indeed, the super-tight labor markets of the war years were the most powerful engine of economic equality in history - not just for the US, but for most other developed countries as well. Recent experience, while less dramatic is consistent with the wartime precedent. Periods of rapid growth and low unemployment — whether in the postwar boom or in more recent periods like the late 1990s — are almost invariably associated with a more equal distribution of income and disproportionate gains for women, non-white workers, the less educated and other marginalized groups. Periods of slow growth

and high unemployment, on the other hand, see disproportionate losses for those same groups and for lower-income workers in general.⁶

The strong link between distribution and demand has important implications for policy today. It implies that the most vulnerable and least privileged workers are the ones who benefit most from full employment.

This in turn suggests that those concerned with economic justice should focus more on macroeconomic policy, in addition to more targeted strategies. Advocates for low-wage workers, working women, and other disadvantaged groups tend to focus on measures that will help them directly, such as higher minimum wages, anti-discrimination rules, and so on. These measures are important and their success undoubtedly improves the position of disadvantaged workers and that of labor as a whole. What sometimes gets overlooked, however, in the fights for higher wages and anti-discrimination in the workplace, is that their success depends critically on macroeconomic policy that maintains strong demand and low unemployment. So advocates for the poor and the excluded should also be calling for more expansionary monetary policy by the Federal Reserve and opposing federal budget austerity. Maintaining aggregate demand will be especially critical in the post-coronavirus period, when there are sure to be widespread calls to shift the federal budget toward surplus to make up for the large deficits run during the crisis. It's important to recognize that this kind of contractionary policy will, in addition to reducing growth, exacerbate inequality of all kinds.

⁶ This link between overall labor-market conditions and distributional outcomes has recently been recognized by mainstream policymakers. For example, Jay Powell...

Third, and perhaps most important, the fact that strong demand has such a clear and positive effect on income distribution shows that there is no conflict between economic justice and public spending to achieve pressing social goals. Because the high demand from increased public spending reliably improves the labor-market position of the least privileged workers, we can be confident that a crash program to combat climate change, or a massive expansion of public-health spending, will ameliorate rather than exacerbate existing inequalities. Between meeting the pressing challenges of the 21st century, on the one hand, and building a more just economy, on the other, there is no tradeoff. The more we do on the first, the better we will do on the second.

Income distribution during the war

One of the most important economic consequences of the war effort was a massive redistribution of income. Despite the lack of direct redistribution through taxes and transfers, the war years saw by far the greatest compression of incomes in US history. The share of income going to lower-paid workers, to women, to African American workers, to agricultural workers and other disadvantaged or marginalized groups all rose sharply during the war. By some measures, the compression in incomes during the 1940s accounted for the majority of the “great compression” of incomes during the mid-20th century. This massive downward redistribution happened despite the fact that there was little direct redistribution during the war — testimony to the immense power of a “high-pressure” economy to improve the relative position of working people.

As discussed below, taxes during the war years, while high by historical standards, were not particularly progressive. Nor did the federal government take major steps to redistribute income in other ways. While the Roosevelt administration did support the extension of union

membership, regulations to promote fair wages were halfhearted and effectively unenforced. The priority was on maintaining uninterrupted production; there was little active labor market policy, and the only effective wage regulations were aimed at holding down wage increases. Despite all this, the extended tight labor markets of the war years resulted in the greatest downward income redistribution in US history. A central lesson of the war years, then, is that an extended period of sufficiently strong demand is, by itself, the most powerful force known for income redistribution.

LESSON EIGHT: Tight labor markets are a powerful force for redistribution, even in the absence of direct policies to raise incomes at the bottom.

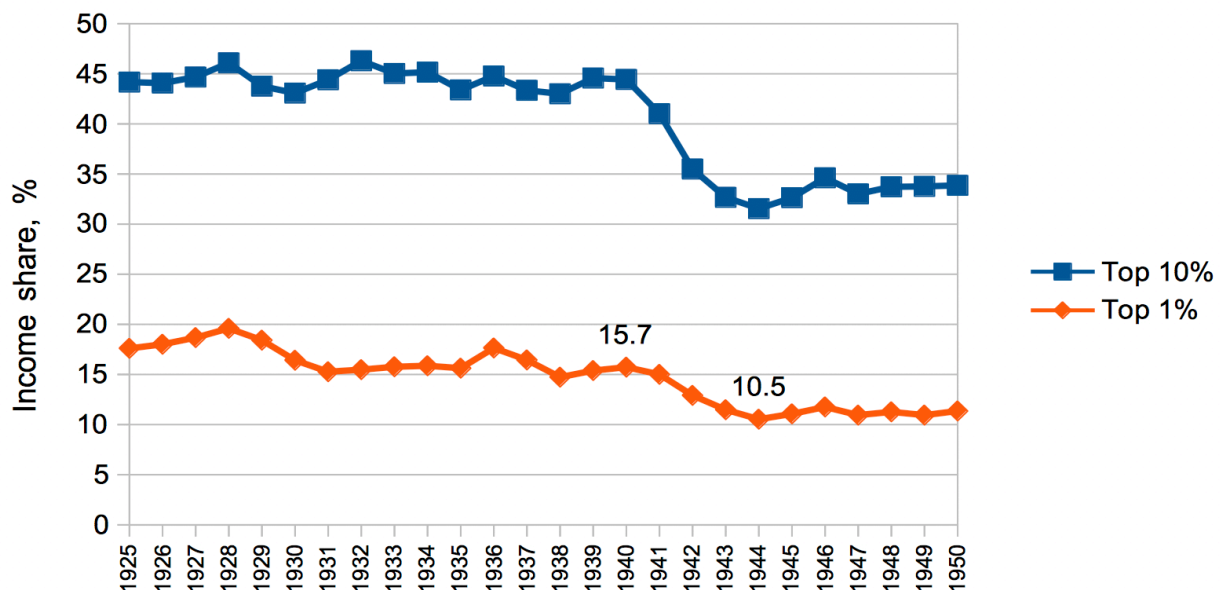
The increase in production and investment during the war led to steadily lower unemployment, with the unemployment rate falling to 0.9 percent in 1944. At the same time, union membership jumped from 16.3 percent of the civilian labor force in 1939 to 27.4 percent in 1944. The share of income going to the top 1 percent fell from 15.4 percent of national income in 1939 to 10.5 percent at the end of the war. The decline in the share of income going to the top 10 percent of income earners fell even more steeply, by a full 13 percentage points from 1939 to 1944. This income compression is one of the most remarkable aspects of the war economy. It is even more remarkable for the fact that, despite some recovery in the top share after the war, the compression lasted for roughly a generation after the end of the war.

Figure 4 shows the proportion of national income going to the top one percent and top 10 percent of households in the period around the war. As the figure shows, the share of income going to the top 1 percent of households fell by a third from 1940 to 1944. The share going to the

top 10 percent fell by nearly as much. There is no remotely comparable example of such rapid income compression in any other period of American history.

A similar story applies to most other advanced countries during the war. In France, Canada and Japan the top 1 percent shares fell from 16 to 8 percent, 18 to 10 percent, and 20 to 6 percent, respectively. (Scheidel 2017) While it is sometimes claimed that these falls in top income shares, and of capital income in particular, were the result of the destruction of capital goods during the war, this explanation is belied by the fact that similar large falls in top shares were seen in non-belligerent countries like Ireland, Portugal, Spain and Switzerland, as well as in belligerents that were spared any direct cost of fighting, such as Canada and the United States. While some of this income compression can be attributed to the political and social shift toward egalitarianism during the war period, the major cause must be the macroeconomic conditions of wartime.

Figure 4: Top Income Shares, 1925-1950



Both the top 1 percent and top 10 percent shares of income fell by about a third during the war, by far the largest fall over such a short period in US history. Source: World Inequality Database

Other possible explanations for the leveling of incomes during the war don't seem to fit the facts. Goldin and Margo (1992), for example, argue that the main factor was the decline in the wage premium for skilled and educated workers. But this cannot explain the declining share of the top 1 percent of incomes which, then as now, were primarily derived from capital ownership rather than labor.

Other more recent work argues that rising union membership was the driving force behind the decline in inequality (Farber et al, 2018). The growth and, even more, the solidification of union representation was certainly a critical economic development of the war years. But it was largely, if not entirely, the consequence of the strong demand for labor during the war. It is true that union membership had already increased significantly during the mid-1930s due to changes in labor laws, primarily the Wagner Act of 1935 and its approval by the Supreme Court in 1937. The recently formed CIO, which was focused on unionizing low skilled workers at the industrial level, made effective use of these legal changes. However, the initial spurt in union membership associated with these developments had largely tapered off by 1939 and union density was beginning to decline again by 1940 (Freeman, 1997).

The larger and more sustained growth in union membership came not during the 1930s but once rearmament was underway and accelerated after hostilities broke out. Increasing employment in unionized industries mechanically increase union members; and more importantly, the low wartime unemployment rate, below 2% from 1943-1945, also made it possible for workers to demand concessions and union recognition with a tight labor market at their backs. As well, the federal government's top priority with respect to industrial relations was uninterrupted production. Since the federal government saw unions as useful in containing the rank and file, the federal government was generally inclined to make concessions towards unions during the war. So, unionization is probably best seen less as an

independent factor promoting income equality, and more as one of the channels through which the high demand for labor operated. While the Roosevelt administration was, of course, broadly pro-labor, it is highly unlikely they would have been able or willing to intervene as aggressively in support of union recognition if economic conditions had not made workers' threats (implicit or explicit) to withdraw their labor so credible.

This has important lessons for decarbonization. It is sometimes suggested that there is a tension between pushing for the largest and most rapid spending program possible and pushing for a program that benefits those lower down the income distribution. But the wartime experience suggests that this is a false dichotomy. The larger the spending program, the easier it will be for ordinary workers to win higher wages and other gains.

LESSON NINE: When increased public spending creates tight labor markets, this disproportionately benefits those with the worst, least paying jobs, even if they are not the direct recipients of the new spending.

The strong demand for labor disproportionately benefited those with the worst, least-paying jobs, even without any systematic public effort to bring this about. A central lesson from the wartime mobilization, then, is that sustained tight labor markets are, even in the absence of explicit redistributive policies, an extremely powerful tool for shifting income from capital to labor and, among workers, for shifting income from higher-income and relatively privileged workers to the lower-paid and to more marginal groups. This suggests that there is no conflict between the goals of massively increased public spending and greater equity.

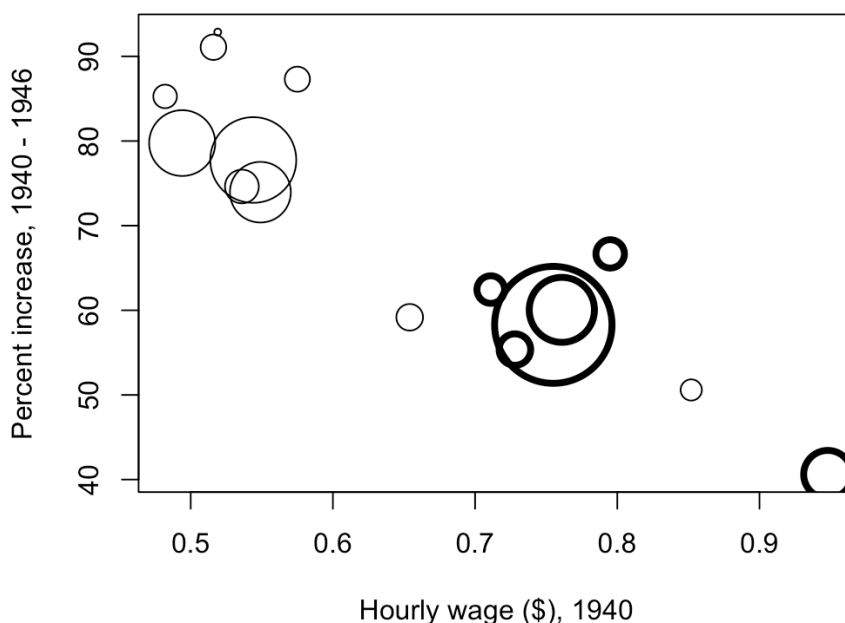
This does not imply that explicit redistributive policies are unnecessary or undesirable. But it does suggest that people concerned with inequality should be careful not to focus exclusively on direct redistribution through taxes and transfers; it is at least as important to create a

macroeconomic environment favorable to workers. Conversely, it suggests that concerns that full employment will leave vulnerable groups behind may be overblown. Indeed, contemporary evidence shows that it is lower-income workers, the less educated, and Black and Latino workers whose wages and employment prospects benefit most from overall labor market tightness. (Bivens 2018) The wartime experience suggests that the benefits to those at the bottom would be even greater if a major expansion of public spending created a true sustained high-pressure economy.

Income distribution across industries

Much of the overall rise in wages during the war came from a shift from lower-paid to higher paid sectors. In particular, the war saw a massive shift away from agriculture, by far the lowest-paid sector at the time). Nearly 7 million people moved out of farm areas during the war years, and nearly all of them found higher-paying jobs in other industries. There was little reversal of these gains after the war.

Figure 5: Nominal wages and wage gains by industry, 1940-1946



The figure shows average hourly wages in 19 major industries and the increase in average wages in each industry during the war. The sizes of the circles correspond to average employment during the war. The heavier circles are war industries. As the figure makes clear, there was very strong convergence in wages across industries, with the largest increases in industries with the lowest pre-war wages. Surprisingly, the biggest wage increases came in industries not directly related to the war effort.

Not surprisingly, during the war weekly earnings rose rapidly in manufacturing industries geared to war production⁷. Given the stringent wage controls, which were binding in war industries, most of this was driven by an increase in hours worked. Increases in weekly earnings associated with longer hours were largely reversed after the war. Hourly wages, however, increased across the board, even faster in non-war than in war industries, and these gains were largely maintained.⁸ In other words, the overall effect of wartime demand on labor-market conditions swamped any tendency of gains to go to the more direct beneficiaries of wartime spending - an important lesson for today.

There was a very strong convergence of wages during the war. Figure 5 shows the hourly wage by industry in 1940, and the increase during 1940-1946. As the figure shows, there is a very tight relationship, the lower prewar wages, the larger was the wartime increase. In automobile manufacturing, for example, wages average 96 cents per hour in 1940; during the war years, this increased by 40 percent. In both steel and nonelectrical machinery, prewar wages were 76 cents per hour, and in both, they increased by about 60 percent during the war. And in textiles and paper, where prewar wages averaged around 50 cents per hour, the wartime increase was close to 90 percent.

⁷ We adopt the convention used by contemporary statistical agencies and include in “war industries” the following Standard Industrial Classification manufacturing categories: iron and steel, electrical machinery, nonelectrical machinery, nonelectrical machinery, automobiles, transportation equipment other than automobiles, nonferrous metals, chemicals and allied products, petroleum and coal products and rubber products.

⁸ The non war industries included here are: lumber and timber basic products, furniture and finished lumber products, stone, clay and glass products, textile products, apparel, leather and leather products, food and kindred products, tobacco manufacturing, paper products, and printing and publishing.

What is especially striking about this pattern is that war industries, which generally were higher wage sectors, did not see any disproportionate wage increases. In the figure, war industries are shown with heavier lines; it is clear that the largest wage gains were all in non-war industries. No explicit policy encouraged these gains; on the contrary, wartime wage controls tended to preserve the existing distribution of wages. Nonetheless, low-paid workers across the economy were the biggest beneficiaries of the super-strong wartime labor markets.

To some extent, the wartime convergence of wages across industries was a product of wage controls, which bound most tightly in higher wage sectors. But it also suggests something important about labor markets in general: It shows that an improvement in labor's overall bargaining position has the biggest benefits for those who have the least bargaining power to begin with. Proposals to maintain full employment through higher public spending are sometimes met with the criticism that simply raising demand for labor across the board will leave less privileged workers behind. The wartime experience suggests that the opposite is true. Workers with credentials, strong unions, or other institutional protections depend less on overall labor market conditions for their wages and working conditions. It is precisely the least privileged workers who benefit most from full employment.

Agricultural workers during the war

Agriculture is not included in Figure 5, since hourly earnings are not available for that sector, only weekly. But it is worth saying something about the experience of farm workers, whose earnings were lowest of any sector. In 1939 average weekly farm earnings were \$8.96. These earnings continued to increase throughout the war to \$23.85 in 1945. Consistent with the pattern in Figure 5, this 270 percent increase in weekly earnings was the largest of any

industry. Adjusting for inflation, this was a 71 percent increase in real earnings. Despite the absence of any significant unionization in agriculture or any direct policy to raise wages there, farmworkers got the largest raises of any groups of workers during the war years. And these gains were fully maintained after the war.

There are several reasons why farm workers saw the largest wage gains during the war. First, while wage controls were strict in nonfarm industries, particularly after 1942, there was no systematic effort to regulate wages in agriculture. Wage caps on farm workers were set at \$200 per month (Ducoff p108, 1945). However, even by 1946, when controls were lifted, average monthly rates were well below this \$200 cap even in regions with the highest monthly farm earnings (BLS Bulletin 883, 1946).

LESSON TEN: Workers currently in low-productivity jobs might be capable of doing more valuable work, if there were sufficient demand. This is a form of disguised unemployment, and implies additional space for increased public investment.

The lack of wage controls amplified the effects of the other major factor favoring agricultural workers, the dramatic wartime outmigration from farm areas. While the migration away from farm areas had been steady dating back to the 1920, this out migration increased significantly during the war years with 7 million people (23% of the 1940 farm population) leaving farms between 1940 and 1944. The first year of declared war, 1942, saw the movement of 2.78 million people off farms. In 1945, as the war and war production wound down the trend reversed itself and there was net migration to farms area. Importantly, of the 7 million people migrating away from farms, only about 1.85 million migrated into the armed forces. The remainder of migrants moved off the farm for other reasons, primarily for economic reasons. (Bureau of Agricultural Economics, 1946 and 1947). This large out migration of

workers put significant pressure on farm wages, pushing up incomes for those farm laborers who stayed on the farm.

A vivid sense of what this meant on the ground can be found in histories of the period. Wilkerson (2010), for example, describes how the departure of many black men to the military and to industrial jobs in the cities allowed black orange pickers in East Texas to win much higher wages, and spurred efforts at unionization. Even though oranges had no direct connection to the war effort, and the federal government made no effort to regulate wages or working conditions, the mere existence of opportunities elsewhere led to a doubling of wages in a short period.

One implication for the present is what counts as a “good job” is not fixed, but depends at least partly on the level of overall spending and employment. In a sufficiently strong labor market, today’s low-paying jobs are likely to see big gains in productivity and pay, even if the direct impact of public spending is elsewhere. Similarly, while it is appropriate — and often politically vital — to offer compensation to workers displaced from specific occupations by our responses to the coronavirus or climate change, we should not lose sight of the fact that the most important thing for these workers will be the state of the overall labor market. Retraining and relocation assistance will be ineffectual if there are no good jobs available. If demand for labor is strong enough and unemployment is low enough, on the other hand, eliminating some existing jobs will be less painful.

Another implication of the demand-driven migration out of agriculture is that agriculture before the war employed considerably more workers than was technologically necessary - or to put it another way, there were productivity gains that were not realized as long as agricultural employers endured slack labor markets. This may be a sign of a more general

pattern. In addition to measured unemployment, there may at any time be many workers who are engaged in work that is lower-productivity and lower-pay than they are capable of. But the transition to higher-productivity work, often involving geographic movement as well, is too difficult or costly under normal conditions. This view is consistent with more recent theories of the labor market, which emphasize search costs and other frictions impeding the movement of workers to higher-paid jobs.

The great Keynesian economist Joan Robinson described workers trapped in lower-productivity activity as “disguised unemployment.” The wartime movement of workers out of agriculture suggests that there may be deep reserves of this kind of disguised unemployment. It also suggests that it may take a very large surge in demand to overcome the frictions that keep workers from transitioning to higher productivity work, and hence, that a big boom in spending may have a disproportionately larger impact than a more extended period of “normal” full employment. This suggests that decarbonization could have a major positive effect on productivity not only by fostering technological improvement in green activities, but by providing a big enough demand shock to allow workers to transition out of lower-productivity industries and occupations.

LESSON ELEVEN: Tight labor markets are a powerful force for closing the earnings gap between Black and white workers but by themselves may do little to overcome entrenched white supremacy.

Black workers’ wage gains during the war

The war period saw by far the greatest convergence of Black and white incomes since reconstruction. The difference in average wages between Black and white men fell by a staggering 50 points during the 1940s, from white men earning 110 percent more than Black

men to a (still substantial) 63 percent more. (Maloney 1994) This is a much faster convergence than in any subsequent decade. If we focus on median wages, the war years stand out even more - the 1940s is the only decade in the 20th century to see a significant closing of the gap between Black and white workers.

The gains for black workers during the war were the direct result of the extremely tight labor markets. This operated through a number of channels. Most obviously, employers desperate for workers could not afford to discriminate in hiring, pay and promotion - or at least, not to the same extent as in peacetime. Probably more important than reduced discrimination by employers in a given industry, was the massive shift of Black workers between sectors. The largest part of the convergence, however, came simply from the flattening of the overall wage distribution. Since Black workers were mostly stuck in lower-paid jobs, anything that closed the gap between higher and lower paying positions disproportionately benefited them. If we focus on the median rather than the mean, this overall flattening of the wage distribution likely explains the entire convergence of Black and white wages during the war period. (Bayer and Charles 2016)

The war years saw a historic movement of African Americans out of agriculture into industry. The fraction of African American men employed in manufacturing rose from 28 to 35 percent during the 1940s, while the share of white workers in manufacturing was near-constant at 38 percent. There was also some convergence in occupations — while the proportion of Black workers in professional and managerial positions remained very low, there was a substantial increase in the fraction in semi-skilled operative and clerical positions. (It's noteworthy in this context that the education gap actually widened during this period - the difference in the fraction of white and black workers with high school diplomas was 23 points in 1940, and 26 points in 1950.) Alongside this shift from agriculture to manufacturing was a movement of

Black workers away from the South, which fell from 68 to 57 of Black employment, and into major cities, which rose from 45 to 52 percent.

To be sure, these were ongoing trends, but the shifts during the war years were several times faster than before or after - the share of Black employment in the South fell by only 3 points in the 1950s. Given the higher wages in manufacturing than in the sectors African Americans were disproportionately employed in, and in wages in the North and cities relative to rural areas and the South, these shifts delivered substantial relative gains for African-American workers relative to whites. According to one estimate, together these three shifts together account for about a quarter of the convergence between average wages for black and white workers during the war period. (Maloney 1994)

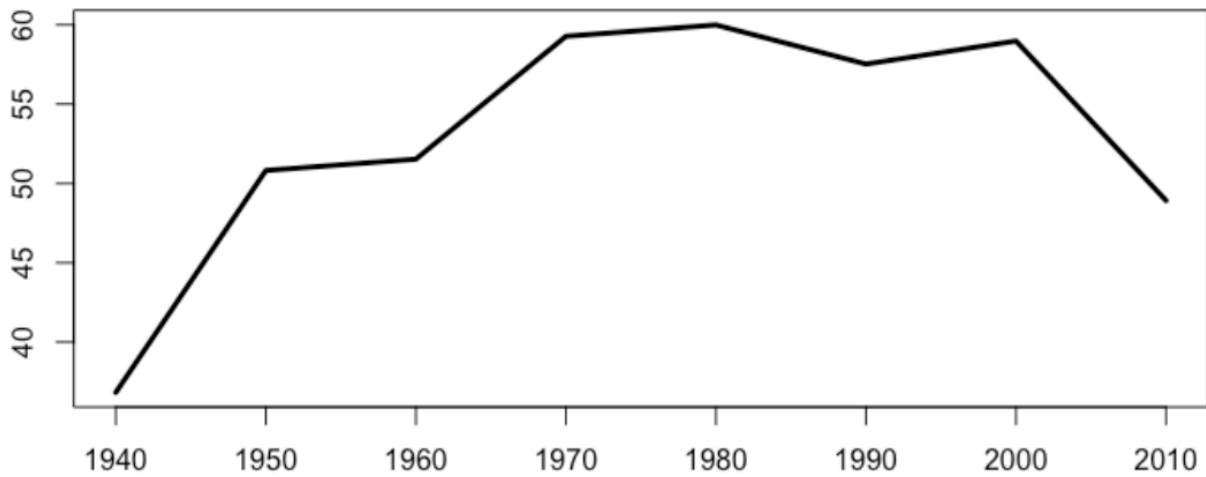
By far the most important reason that the income differential between Black and white workers shrank during the war period, however, is that *all* income differentials shrank. Whether we compare more educated to less educated, urban to rural, across industries or occupations, or simply the top of the distribution to the bottom, the gap was substantially smaller in 1950 than in 1940. The majority of the convergence between the mean Black and white wage, and the entire convergence between the Black and white median wage, is explained by this overall compression of the wage structure.

Figure 6 shows the change in earnings of Black men age 25-54 as a percent of median earnings of white men age 25-54.⁹ Panel a of the figure shows the median earnings of black men aged 25-54 as a percent of the median earnings of white men aged 25-54. Panel b then decomposes the shifts in the wage gap in panel a into two components. The positional

⁹ Focusing on “prime-age” men is a standard way of isolating the effect of race from other demographic factors.

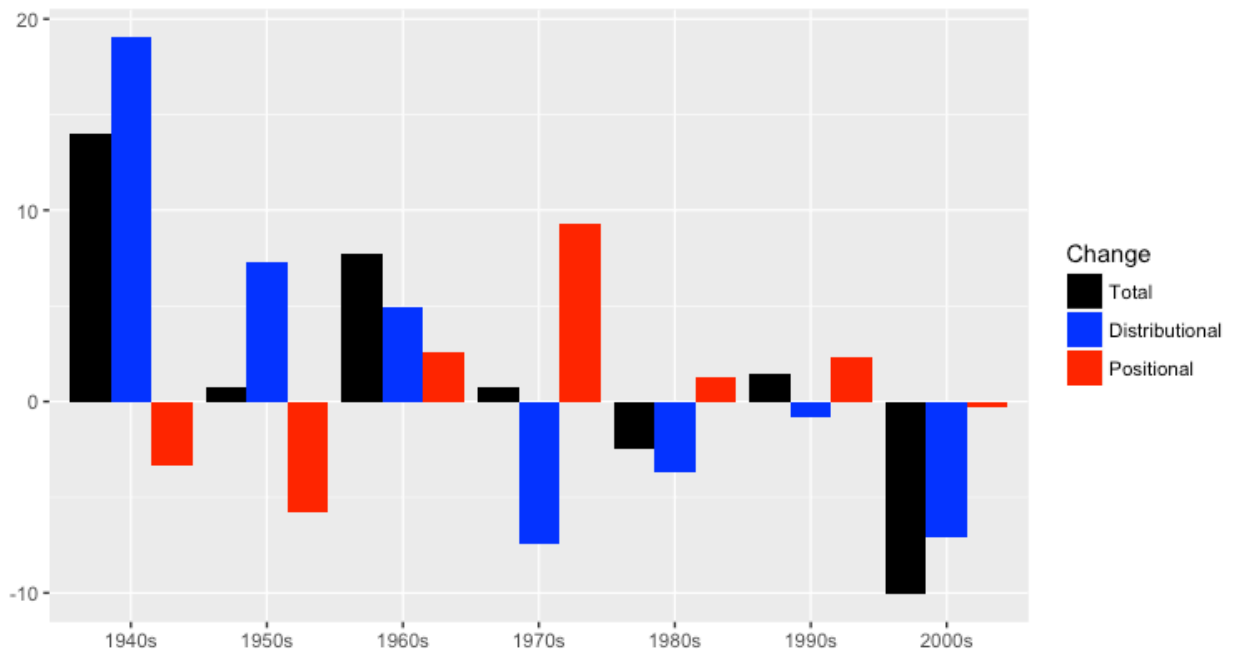
component is the impact of the movement of Black workers relative to workers within a given distribution of wages. The distributional component is the impact of the change in the overall distribution of income on the gap between median Black and white earnings.

Figure 6, Panel a: Median earnings of black men 25-54 as percent of median earnings of white men 25-54



The figure shows that while the median wage of black men rose from about 35 percent to over 50 percent of the median wage for white men during the 1940s, the gap was as large in 2010 as it was 1950. While annual data isn't available for this period, it's likely that most if not all of the 1940s convergence happening during the war years.

Figure 6, Panel b: Percentage point change in median wage gap



The figure breaks the change in black men's median wage as a percent of white men's (the black bar) into two components. The distributional component (blue) is the closing of the gap due to the flattening of the entire wage distribution; the positional component (red) is the closing of the gap due to black workers moving upward within a given overall distribution. Source: Bayer and Charles 2016, authors' analysis

Panel a of Figure 6 shows that the gap between median black and white wages closed much more during the 1940s than during any subsequent decade.¹⁰ In fact, the median earnings of a prime-age Black man were closer to the median earnings of a prime-age white man in 1950 than in 2010. This reinforces the idea that the massive demand for labor during the war disproportionately benefited Black workers, who were typically last in line to be hired for better-paying jobs.

Panel b shows that the entire convergence of Black and white median earnings during the 1940s was due to the distributional component. In other words, the entire convergence of Black and white median earnings in this period was due to the compression of the income distribution as a whole, so that the 25th percentile, say, was much closer to the 75th percentile. We can see the same pattern in later decades. This “distributional” component of the gap between Black and white median earnings consistently has stronger effects on the gap than the “positional” component — the relative movement of Black and white workers within the distribution. Thus when the gap closed further in the 1960s, it was, again, primarily because the overall distribution was getting flatter (though in this decade there was some positional convergence as well). In later decades, African-American workers did move up within the distribution, as shown by the positive values for the positional component. But this upward movement was more than offset by the fact that the entire distribution was becoming more unequal.

¹⁰ Today, detailed data on demographics and labor-market outcomes are collected regularly by the Current Population Survey and the American Community Survey. But for the mid-20th century, we are dependent on the decennial census. But there is no reason to doubt that the change during the 1940s reflects mainly or exclusively developments during the war.

If we extrapolate from the wartime experience with the racial income gap to the problem of a just transition from carbon, we can draw two conclusions, one positive and one negative. The positive conclusion is that any compression of incomes will disproportionately benefit those at the bottom. Very tight labor markets, as seen by the war, are themselves a powerful engine for equality, since it is precisely the least privileged who are most dependent on the state of the labor market. People with credentials, political power, or other forms of social capital may be able to demand higher wages even when labor is abundant. Those without such advantages must depend on the scarcity of their labor. The fact that changes in the overall distribution associated with periods of strong labor demand (the 1960s were also widely considered a “high pressure” economy) are responsible for the only convergence of Black and white median earnings observed in the past 70 years, shows how important such macro conditions are. Anyone concerned with income equality should see producing something like wartime labor market conditions as a major attraction of a Green New Deal.

On the other hand, we should not ignore the failure of the war to generate any positional convergence, at least at the median. This is presumably linked to the lack of effective measures to enforce wage fairness and nondiscrimination, and the resistance of most employers to relaxing racial hierarchies in the workplace any more than they had to in order to keep their plants staffed. (In the Texas orange fields mentioned above, while wages did rise, unionization efforts were defeated by threats to lynch the organizers. (Wilkerson, 2010) The push and pull between the openings for African-American workers created by tight labor markets, and the efforts of employers (and many white workers) to maintain racial hierarchies is visible in many accounts of wartime life. A contemporary version of this story is told in Chester Himes’ 1945 novel, *If He Hollers Let Him Go*, which vividly dramatizes how the

war greatly expanded economic opportunities for Black workers while the overarching superstructure of white supremacy remained intact.

Labor market policy during the war

The massive redistribution of income during the war happened without any systematic intervention in the labor market by the federal government. Other than an overriding concern with maintaining labor peace, the war effort included little of what we would today call active labor market policy. No systematic effort was made to modify the wage structure or to challenge established structures of authority in the workplace. For the most part, the recruitment and training of workers was left to private employers, while the geographic movement of workers to centers of war production and the meeting of their housing and other needs there were left to the workers themselves.

Peterson (2013) describes a typical example, the giant Willow Run bomber factory built outside of Detroit. Initially, labor leaders and some administration officials had seen the need for housing for workers at the plant as a chance to develop a new model of working-class housing, a planned community that would offer affordable housing and amenities for workers at the factory without the need for long commutes. But strong local opposition — including over the fact that the new housing would be open to Black as well as white workers — led the ambitious proposals to be shelved, and the problem of housing for the plant's workers was left to local governments to solve in a haphazard way.

In general, war planners were prepared to intervene extensively to maintain supplies of key raw materials and to rapidly scale up industrial production, but there was less concern about ensuring supplies of labor. As one official postwar review of the mobilization effort put it,

early war planning took place “in an atmosphere charged with the feeling that there probably was no problem of labor supply, and that even if such a problem existed employers could handle it by their own efforts.” (US Bureau of the Budget 1947)

In April 1942, the War Manpower Commission (WMC) was established; this body would have responsibility for efforts to maintain labor supply through the war. For the most part, however, both government and employers were less concerned about shortages of labor in any absolute sense, than with the increased bargaining power workers enjoyed. In a number of industries, employers made agreements against “labor piracy,” committing not to hire each other’s workers so as to avoid competing on wages. Shortages of skilled workers were dealt with by “breaking down and simplifying skilled jobs, installing training programs, and accelerating promotion” of workers in less-skilled positions - changes that presumably also contributed to productivity gains during the war (US Bureau of the Budget 1947, 173). The government for its part sought to limit wage increases for almost industrial workers, and about half those outside of industry, to 15 percent above the level prevailing in 1941 - the so-called Little Steel formula — and intervening aggressively against strikes (Sparrow 2011, 162).

Leaders of the CIO and their allies in the administration argued for policies that would extend the federal government’s authority into the workplace itself. Labor leaders like Phillip Murray and Walter Reuther, with the support of administration liberals like Leon Henderson and Harry Hopkins, argued for reorganizing industry through a set of industrial councils. These would create tripartite bodies that would exercise direct control over production decisions across existing corporate boundaries, effectively supplanting existing management and giving workers substantial direct control over the workplace. The Roosevelt administration eventually rejected the industrial council plan or any similar effort to challenge the authority of private management within the firm (Lichtenstein 1992; 40-41; 83).

On the wage side, while the regulations were somewhat effective in overall wage rises, efforts to enforce wage fairness seem to have been ineffectual. For example, the Fair Employment Practices Commission, established under pressure from the prominent Black union leader A. Philip Randolph to adjudicate claims of racial discrimination, did not impose significant penalties on any employer or union during the war (Sparrow 2011, 178-184). Executive Order 9328, signed by Roosevelt in April 1943, largely eliminated early efforts to promote equalization of wages. It also brought the NLRB under the authority of the Office of Economic Stabilization, ending its status as a tripartite body on which union representatives could play an independent role. And it attempted - though without much effect - to limit workers' right to quit jobs in war industries to take better paying ones (Lichtenstein 1992; 116, 146-147).

In short, during the war the federal government, despite its extensive economic planning in other areas, made little direct effort to manage the distribution of income. There was relatively little intervention in the labor market compared with other areas, and, to the extent it was effective, it was aimed at restraining wage increases. It is all the more striking, then, that the war period saw the most dramatic redistribution of incomes in US history, and that the benefits were greatest for those at the bottom of the distribution. This is one area where a Green New Deal could go well beyond the war mobilization.

Income taxes and income distribution

One might expect that progressive taxes would be a major factor in the compression of incomes during the war, especially given the great expansion in federal tax revenue. Surprisingly, this is not the case. The federal income tax actually became more regressive during the war, and moderate-income households found themselves subject to it for the first time. One reason for this was that redistribution conflicted with another major goal of tax policy during the war, inflation control. The

problem is that the taxes that are most effective at limiting consumer demand are those that fell on working and middle-class families rather than the rich. As a result, despite some support for more progressive taxation within the Roosevelt administration, the major increase in federal income taxes during the war came from extending the base downward, rather than raising rates at the top.

LESSON TWELVE: The goals of revenue raising, inflation control and redistribution each imply a different kind of tax. If the goal is to use the tax system for redistribution, that needs to be argued for explicitly, since a steeply progressive tax may not be the most suitable for other purposes.

Macroeconomic policy during the war did not involve today's main inflation-management tool, the use of interest rates to control demand. Interest rates on public debt were held at a fixed, low level during the war. But anti-inflation measures were not limited to wage and price controls. Tax increases and savings campaigns were also used to curb private demand. Indeed, for many economic policymakers in the administration, taxes were only secondarily seen as a way of "paying for" the war effort; their primary function was as an anti-inflation measure, meant to stifle the pressure of increasing national income on aggregate demand. (John Maynard Keynes made parallel arguments in the UK, summarized in his 1940 book *How to Pay for the War*.)

A number of figures in the administration, including Roosevelt himself, saw taxes as important to ensure that the burden of the war was being shared fairly, and pushed for progressive taxation with an emphasis on heavy taxation for the wealthy and corporations. Unfortunately, the goals of financing public spending, inflation control and promoting fairness each imply a different types of taxes. In the event, the first two goals won out, and efforts to create a more progressive tax system did not make much headway during the war.

In the 1939-40 rearmament period, Roosevelt and his Secretary of the Treasury Henry Morgenthau sought to finance the military spending through taxes corporations and the highest incomes.

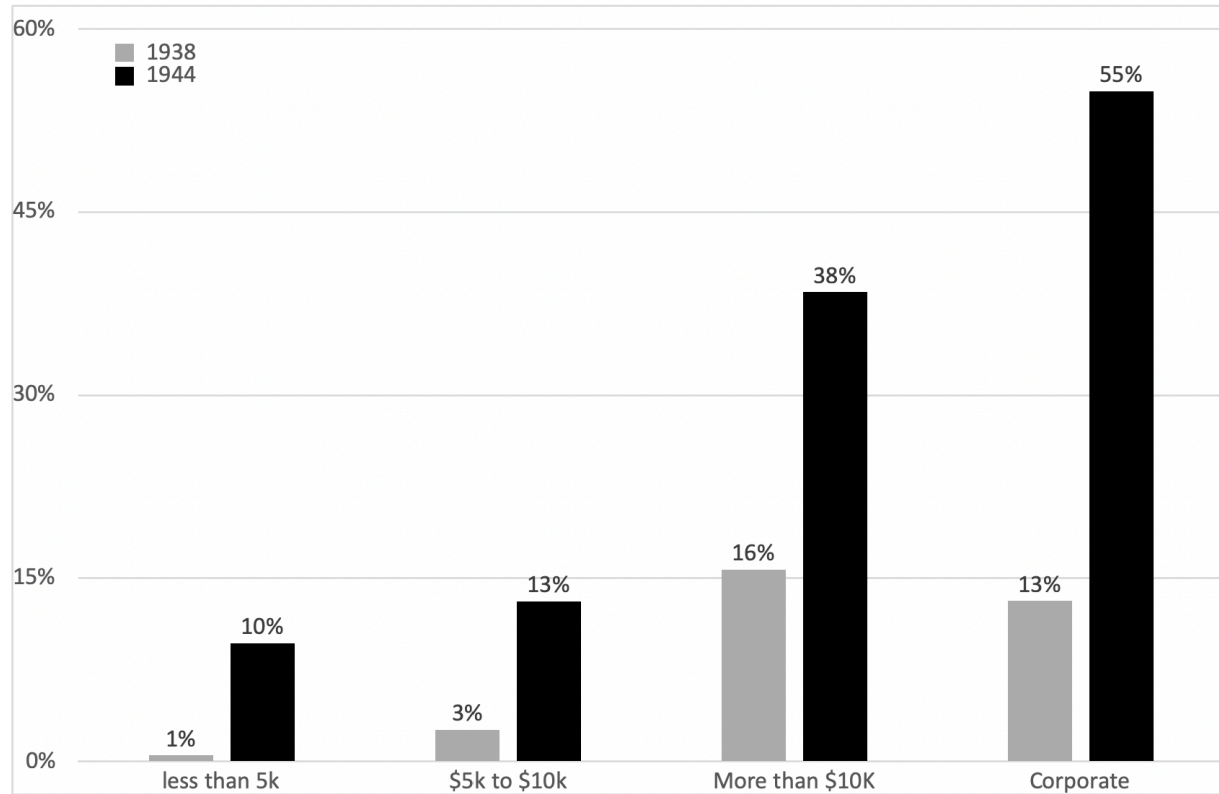
However, these attempts were stymied by conservative Democrats in congress. And once the priority

shifted to inflation control, taxes on high-saving rich households and corporations were of limited value, especially given the great downward redistribution of spending power during the war. Already in 1941, 80 percent of the additional income of the rearmament boom went to low and middle-income groups, so any tax aimed at curbing aggregate spending would have to fall largely on them (Vatter, 1985; p109). There was also an important group within the administration who argued that taxes on profits would discourage business investment after the war and favored a national sales tax as an alternative. (Brownlee, 2004) Fed Chair Marriner Eccles, the head of the OPA and the vice president also supported a sales tax. A sales tax has more anti-inflationary potential than an income tax, since it directly reduces household consumption. However, because lower-income households consume a greater fraction of their income, a sales tax is regressive.

The president continued to make efforts to use the tax system for redistribution during the war, including a proposal for a maximum wage. But these were blocked by congressional opposition— one of his few major legislative defeats during the war (Sparrow p. 176). In the end, while there was a large increase in the overall level of income taxes during the war, the rate structure became much less progressive. Income tax revenue increased from less than 3 percent of GDP in 1938 to 16 percent in 1944. But while rates for the highest earners rose from around 10 percent to around 38 percent, rates also increased sharply for lower-income households, and the base was broadened to include many millions who had not been required to file taxes at all before the war. (See Figure 7) As a result, income taxes played little role in the flattening of incomes during the war.

On the corporate tax side, the key battle was over the 1943 Revenue Act. Roosevelt vetoed the bill, which “create[ed] a host of new tax favors for business, especially the mining, timber and steel industries. Roosevelt denounced the bill as not a tax bill but a tax relief bill, providing relief not for the needy but for the greedy.” (Brownlee, 2004, p114). But his veto was overridden.

Figure 7: Effective Tax Rate by Income Class 1938 vs 1944



Source: IRS Statistics of Income Part 1 and Part II 1939 and 1945, authors' analysis.

Both because of the massive broadening of the households subject to tax, and because of the major change in distribution of incomes during the war, comparing the exact distribution of taxes over the course of the war is a challenge. But Table 2 gives a sense. The first pair of columns show the fraction of returns and fraction of tax paid by income grouping 1938. The second pair of columns gives the same values for 1944. The final column shows what the distribution of tax payments would have been if the 1944 tax rates were applied to the 1938 distribution of income. This is the most relevant number for assessing the progressivity of tax changes during the war.

As the table shows, prewar income taxes were highly progressive. Out of 35 million households, only about six million were required to file income tax returns. And of those, 90 percent faced effective tax rates of less than 1 percent. At the other end, the 2,500 families reporting incomes over \$100,000 - less than one one-hundredth of one percent of the population — paid a full third of federal income taxes.

By 1944, all households were required to file federal income tax returns, and for the first time, even low-income households faced significant income tax obligations. At the same time, the share of income received by the households lower in the distribution had increased dramatically. The combination of these two factors meant that households with incomes under \$5,000 a year were now making the majority of federal income-tax payments, compared with just 8 percent before the war. Meanwhile, the share of income taxes paid by households reporting incomes over \$100,000 had fallen from a third to just 6 percent, despite the fact that the number of such families had increased to over 8,000.

The final column of the table shows the counterfactual case of 1944 tax rates applied to the distribution of incomes reported on the 1938 returns. This calculation makes clear that the downward shift in the tax burden was primarily the result of the change in tax rates, not the downward distribution of income. Even if tax returns 1944 had reported the exact same incomes as tax returns in 1938, the share of taxes falling on the highest income group would have fallen by almost two thirds, while the share falling on the lowest income group would have more than quadrupled. In 1938, the bottom 95 percent of households (roughly those with incomes below \$25,000) paid about 35 percent of federal income taxes. Under the 1944 tax rates, they would have paid 68 percent.

Table 2: Shares of Taxable Income and Tax Payments by Income, 1938 and 1944

	1938		1944		1944 rates with 1938 incomes
Income class	Percent of taxable income	Percent of tax payments	Percent of taxable income	Percent of tax payments	Percent of tax payments
< 5k	63.9	8.3	77.8	54.1	36.3
5k – 25k	25.8	26.9	16.3	24.8	32.3
25k – 100k	7.3	31.0	4.6	15.0	19.4
> 100k	3.1	33.7	1.3	6.2	12.0

Source: IRS Statistics of Income, authors' analysis

In summary, income tax increases during the war did *not* help to equalize income. Tax policy during the war was guided by the goal of reining in demand and controlling inflation, along with the usual goal of financing public spending. Efforts to use the tax system to redistribute income were largely stymied by the political system. As a result, while collections from the federal income tax rose dramatically during the war, there was an equally dramatic shift in the burden of this increased taxation down the income distribution.

The wartime conflicts over taxation offer an important warning for the revenue side of a decarbonization proposal today: taxes serve different purposes, and the same tax is not likely to be the best fit for all of them. In particular, taxes that are good for discouraging consumption — in general, or of particular goods — are unlikely to be good taxes from a distributional standpoint. This problem arises most obviously for a carbon tax (or equivalent carbon-pricing mechanism). Such taxes may be a useful tool for reducing consumption of carbon-intensive goods and services, but they are clearly regressive in their distributional impact.

In general, the taxes that are most effective at limiting consumption — whether for demand-management purposes or for reducing carbon emissions — will be those that fall disproportionately on lower and middle incomes. Such consumption taxes are also likely to be easier to administer and harder to evade than taxes on income or wealth. If the goal is revenue-raising, broad-based income taxes will perform better than ones narrowly targeted at the highest incomes. So if the goal is to use taxes to promote equality, the case for this needs to be made directly, rather than hoping it will be a side effect of taxes raised for other purposes. If non-distributional motives for taxes are emphasized, as in the war and in most subsequent debates, steeply progressive taxes will have a more difficult time winning passage.

CONCLUSION

“Mines and mills and factories to run for Uncle Sam

Producing for the soldier boys that fight for this great land

Our job's a tough one, it'll take us everyone

But this will be the biggest thing that man has ever done

There's warehouse guys and teamsters and guys that skin the cats

Guys that run the steel mill, the furnace and the blast

We'll stop the Axis rattlesnakes and thieves of old Nippon

And that will be the biggest thing that man has ever done

-Woody Guthrie

Seventy-eight years ago, the United States was plunged into a global war. In the end, the United States and its allies emerged victorious, but this outcome was far from preordained. Alongside the military effort, success required a reorganization of the economy and expansion of the public sector without precedent in American history.

Today, the United States, and the world, face equally daunting challenges. These are posed not by enemy powers but by nature, in the form of new diseases and climate change. As in World War II, meeting these challenges will require rapidly transforming our economy.

To deal with a pandemic, tests to be deployed on an industrial scale, health care workers need to be supplied with protective equipment, hospitals and clinics need to be scaled up, and a crash program is needed to develop a vaccine, and most immediately, people and businesses need to be protected from the collapse of market income entailed by lockdowns and social distancing. All of this requires public spending, on a vast scale. The spending required by climate change will be even vaster. Coal power will need to be replaced with wind farms and solar panels — and the workers and owners of the coal mines will have to be compensated. We will need a new fleet of electric vehicles to replace gas-burning cars — and a new network of stations to charge them. We will need a bigger and better grid to transmit electricity, and new technologies for storing it. Buildings will have to be retrofitted and rebuilt. Industry and agriculture will have to be transformed. And all of this has to happen within in a decade or two.

Is there any reason to think that our economy can be reorganized so quickly, or that government can or should play the leading role? The experience of World War II suggests that the answer is yes.

After the Pearl Harbor attack on December 7, 1941, the US had to build a global military almost overnight. That did not just mean recruiting and training soldiers and sailors. To fight a global war, the whole economy had to be retooled. Basic industries had to be scaled up. Scarce raw materials had to be distributed. New technologies had to be invented. In some cases, like synthetic rubber and uranium enrichment, the war effort called for industries that did not even exist.

The mobilization was broadly successful, but it required a new set of policy tools, and a willingness to set aside long-standing ideas about the appropriate role of the public sector. During the war, the great bulk of investment was carried out directly by the federal government. The federal government also

directly allocated key resources like steel and aluminum, a form of central planning that would have been unthinkable outside the emergency conditions of wartime. The result of these interventions was that the great rise in demand from wartime spending called forth an equal increase in supply, with GDP rising by 80 percent over the course of the war. As a result of this remarkable boom, the war years — contrary to most expectations at the time — did not involve economic sacrifice for Americans on the home front. On the contrary, the war years saw a sharp rise in living standards for ordinary Americans, as well as the greatest compression of incomes in US history. Marginalized groups including agricultural workers and African Americans, benefited especially from the super-tight labor markets of the war.

In this paper, we have laid number of lessons that supporters (and skeptics) of the Green New Deal might draw from the war mobilization effort. We can summarize these with two overarching conclusions.

The first is that big changes call for big plans. And big plans, in turn, can deliver big results - a well-targeted infusion of public dollars can deliver much faster economic growth than we normally experience. Most of the time, in other words, the economy is operating well below its potential.

Building a war economy was not just an incremental expansion of military production, requiring just more orders for guns and ships. It required a far-reaching transformation and expansion of productive capacity. Faced with the military production goals laid out by President Roosevelt at the start of the war, private markets would have seized up, paralyzed by unpredictable price spikes, shortages, hoarding, and other coordination failures. Only deliberate planning was able to ensure that all the key industries expanded together. Climate change and public health crises create similar coordination problems - pandemics cannot be effectively dealt with by decentralized markets. They require a similar kind (if not degree) of central planning as the war effort to make the rapid, coordinated changes required.

Conversely, coordinated mobilization to meet a pressing social problem can have impressive economic benefits. When President Roosevelt made his famous “arsenal of democracy” speech, calling for 60,000 planes, 45,000 tanks, 20,000 anti-aircraft guns and 6 million tons of transport ships to be built in the next year, many economists thought these goals could be met, if at all, only with deep cuts in civilian consumption. But in fact, Roosevelt’s ambitious goals were largely achieved, even while living standards on the home front continued to rise. A few scarce resources, like rubber, had to be rationed, and no new cars were built during the war. But food, clothing, and most other civilian goods were more abundant than ever.

Massive investment in decarbonization today may, similarly, reveal that the US economy has long been operating well short of potential. Even before the coronavirus struck, there were still many people not participating in the labor market who might have if job prospects were better; and there were many more people with low-paying jobs who were capable of doing much higher-productivity, higher-wage work if the demand for it were there. Investment in public health and new green technologies is not only the best way to restart the economy after the coronavirus emergency. If sustained, it is likely to lead to faster productivity growth and higher incomes, just as war mobilization saw sharp productivity gains in war industries. It’s quite likely that, just as in World War II, when we push down on the economic accelerator, we will find that we have been running on one cylinder up until now.

The second broad lesson we draw from the war mobilization is that a high-pressure economy is, historically, the most powerful force there is for greater economic equality.

The war years saw the greatest compression of incomes in US history. Similar downward redistribution was experienced, to a greater or lesser degree, across most advanced countries during the war. Across the belligerent countries, the income share of the highest-earning 1 percent of households declined on average by close to one-third. Nonbelligerent countries such as Ireland, Portugal, Spain, Sweden, and Switzerland also saw large falls in top income shares. In many of these countries, the war years accounted for the majority of the flattening in the income distribution of the

“great compression” of the mid-20th century. (Scheidel 2017: 132-4). The wide variety of labor, tax and transfer policies followed in countries seeing comparable flattening of the income structure suggests that this compression was primarily due to tight labor market conditions rather than to specific redistributive policies. Certainly, this is consistent with the US experience, where there was little redistribution through the tax system and labor-market policy focused mainly on preventing excessive wage gains.

The effects of the extremely tight labor markets of the war years reached beyond the distribution of income. They fostered unprecedented social and occupational mobility, as entrenched barriers fell before employers’ insatiable demand for labor. Movement cross occupations, industries, and geographically into cities and across the country was accelerated and facilitated by the immense demand for industrial labor in centers of war production. This churning and mixing helped set the stage for challenges to racial and gender hierarchies in the coming years, as well as greatly strengthening the new industry unions and reinforcing their democratic character. As historian James Sparrow puts it, “social mobility ... flowed directly from the unprecedented demand for labor.” (Sparrow, 114)

For the pandemic response and for decarbonization, the central message of the wartime experience is that there need be no conflict between ambitious public spending programs and fostering greater equality. The slope of the playing field between labor and capital, and more and less privileged groups of workers, is fundamentally determined by overall labor market conditions. In an extremely tight labor market, where unemployment is low and workers are scarce, employees are in a position to demand more — not just higher wages, but more rights in the workplace and, for less privileged groups, access to jobs they have been excluded from. Employers will make many concessions they might otherwise resist when demand is strong and there is no other way to get the labor they need.

An additional 3 to 5 percent of GDP in public and private investment sustained for a number of years, while much smaller than the wartime spending, could go a long way to reverse the fall in the wage

share of GDP and to raise the wages of less privileged groups. Indeed, the wartime experience suggests that simply boosting demand on a large enough scale may be extremely effective in flattening wages.

To be clear, the war experience does not suggest that tight labor markets can by themselves be relied on to break down entrenched hierarchies. If the goal is to offer all Americans equal opportunities in the workplace, or to fundamentally shift the balance of power within the corporation, a high-pressure economy will not deliver that on its own. But it certainly offers more favorable terrain.

Both macroeconomic lessons of the war years point to the same conclusion: Massive public-investment programs, like a vast expansion of public health spending or a Green New Deal, may be much less costly than we think.

Many people think of the economics of managing crises like a pandemic or climate change in terms of sacrifice and austerity, of how much current consumption people will have to give up to preserve a habitable planet. In 1941, people similarly thought of the war effort in terms of austerity and sacrifice. But it turned out that the country was capable of producing more than anyone thought, if there was demand for it. Furthermore, it turned out that pushing the economy to its limits created a labor scarcity that benefited workers, especially the least-paid and least secure.

For working people, the war years saw the fastest income growth in US history. With labor scarce and factories booming, no one was unemployed, and millions of people moved to better paid jobs. It turned out that people who had been thought to lack the skills for high-productivity work — like women, African Americans, and farmers — were just as capable of working in industry when they were given a chance. As a result, the US had guns and butter. Building a massive wartime economy did not require sacrifice, but on the contrary left most people better off.

To contemporaries like Woody Guthrie, the mobilization to defeat the Axis powers was “the greatest thing that man has ever done.” If we learn the right lessons from that time, people may someday say the same thing about our response to the challenges facing us today.

REFERENCES

- Bayer, Patrick, and Kerwin Kofi Charles. 2016. "Divergent Paths: Structural Change, Economic Rank, and the Evolution of Black-White Earnings Differences, 1940-2014." National Bureau of Economic Research.
- Bivens, Josh, and Ben Zipperer. 2018. "The Importance of Locking in Full Employment for the Long Haul." *Economic Policy Institute*. Economic Policy Institute.
- Blum, J.M. 1976. *V Was for Victory: Politics and American Culture During World War II*. American Studies Collection. Harcourt Brace Jovanovich.
- Bossie, Andrew. 2019a. "Employment, Aggregate Demand, and the Reconversion Recession." Working Paper.
- . 2019b. "Monetary and Fiscal Interactions in the USA During the 1940s." *Cliometrica*, 1–43.
- Bossie, Andrew, and JW Mason. 2020. "The Public Role in Economic Transformation: Lessons from World War II." Roosevelt Institute.
- Brownlee, W Elliot. 2016. *Federal Taxation in America*. Cambridge University Press.
- Bureau of Labor Statistics. 1946. "Wartime Wages, Income, and Wage Regulation in Agriculture." Bureau of Labor Statistics.
- Ducoff, Louis J. 1945. "Wages of Wage Rates of Hired Farm Laborers." Report 4. U.S. Bureau of Agricultural Economics.
- Farber, Henry S, Daniel Herbst, Ilyana Kuziemko, and Suresh Naidu. 2018. "Unions and Inequality over the Twentieth Century: New Evidence from Survey Data." National Bureau of Economic Research.
- Freeman, Richard B. 2007. "Spurts in Union Growth: Defining Moments and Social Processes." In *The Defining Moment: The Great Depression and the American Economy in the Twentieth Century*, edited by Michael D Bordo, Claudia Goldin, and Eugene N White, 265–96. University of Chicago Press.
- Goldin, Claudia, and Robert A Margo. 1992. "The Great Compression: The Wage Structure in the United States at Mid-Century." *The Quarterly Journal of Economics* 107 (1), 1–34.
- Gordon, Robert J. 1969. "\$45 Billion of US Private Investment Has Been Mislaid." *The American Economic Review* 59 (3).
- Higgs, Robert. 1992. "Wartime Prosperity? A Reassessment of the US Economy in the 1940s." *The Journal of Economic History* 52 (1), 41–60.
- Lichtenstein, Nelson. 2003. *Labor's War at Home: The CIO in World War II*. Temple University Press.
- Maloney, Thomas N. 1994. "Wage Compression and Wage Inequality Between Black and White Males in the United States, 1940–1960." *The Journal of Economic History* 54 (2).

- Margo, Robert A. 1995. "Explaining Black-White Wage Convergence, 1940–1950." *ILR Review* 48 (3), 470–81.
- Peterson, Sarah Jo. 2013. *Planning the Home Front: Building Bombers and Communities at Willow Run*. University of Chicago Press.
- Rockoff, Hugh. 1984. *Drastic Measures: A History of Wage and Price Controls in the United States*. Cambridge University Press.
- . 1998. "The United States: From Ploughshares to Swords." In *The Economics of World War II: Six Great Powers in International Comparison*, edited by M. Harrison, 81–121. Cambridge University Press.
- Scheidel, Walter. 2018. *The Great Leveler: Violence and the History of Inequality from the Stone Age to the Twenty-First Century*. Princeton University Press.
- Sparrow, James T. 2011. *Warfare State: World War II Americans and the Age of Big Government*. OUP USA.
- Tucker, Todd. 2019. "Industrial Policy and Planning: What It Is and How to Do It Better." Roosevelt Institute.
- United States Bureau of the Budget. 1947. *The United States at War: Development and Administration of the War Program by the Federal Government*. Bureau of the Budget, War Records Division.
- Vatter, Harold G. 1985. *The US Economy in World War II*. Columbia University Press New York.
- Wilkerson, Isabel. 2010. *The Warmth of Other Suns: The Epic Story of America's Great Migration*. Vintage.
- Wilson, Mark R. 2016. *Destructive Creation: American Business and the Winning of World War II*. University of Pennsylvania Press.