WWII Contract Spending and labor and capital income.

Andrew Bossie^{*}

New Jersey City University

This Draft: October 2, 2023

Abstract I find a large negative effect of WWII contract spending on relative state level per capita total personal income growth. This difference in growth rates is driven by both the direct political economy effect of the war and across-state migration. I find that one dollar of contract spending during WWII causes state level personal income to grow -13.4 cents slower by 1947. This effect persists through 1957, the end of the available panel. The war, primarily a shock to manufacturing, had a strong temporary positive effect on the growth of manufacturing income but this evaporated by the end of the war. State level per capita nonmanufacturing income experiences permanently slower growth in response to war spending. This slower growth in nonmanufacturing income is explained 50/50 between migration and the direct fiscal policy effect. Personal capital income (interest, dividends and rent) also grows more slowly in response to WWII spending. This slower growth in capital is explained mostly by migration before 1947 but the direct fiscal effects of the war are responsible for the long term post-1947 slower growth in response to war spending.

Keywords: World War II, Fiscal Policy.

JEL Classification Numbers: N42 E62, H56.

^{*}telephone: 1-347-563-3238; e-mail: *abossie@njcu.edu*; address: 200 Harborside Plaza 2, 2nd Floor Room 205T, Jersey City, NJ 07311. I would like to thank

1 Introduction

Research on the the effect of war spending points consistently to an extensive but not intensive local economic growth in response to WWII contract spending. In this paper I show an unusual, negative, state level income multiplier for WWII contract spending. This negative multiplier shows that the war had a strong, permanent convergence effect on states that received less war spending. Wartime contract spending results in the slower growth of personal income relative to 1940 and this effect is "permanent" in the sense that by 1957—the end of the period for which I have data—personal income growth remains lower in states with war spending. For every dollar of wartime spending total personal income grows 7.3 cents slower by 1945, and grows 13.4 cents slower by 1957. While the per dollar multiplier is small the sheer size of the wartime shock means a large negative effect on the growth of nominal income in states that received war spending. A hypothetical state with average per capita personal income that received an average amount of war spending per capita personal income would be 90 or 13% lower by 1945. By 1957 personal income is lower by 165.93, 12% of personal income. This slower growth in personal income from wartime contract spending is primarily driven by two components of income: slower growth in nonfarm ownership income and slower growth in income from private nonfarm, nonmanufacturing industries¹. In turn, slower postwar capital income growth and lower nonfarm nonmanufaturing income growth are driven by both the direct effect of the large fiscal policy shock and the indirect effects of the large across-state migration induced by the war. Migration and direct fiscal effects explain roughly 50% of the slower growth of total personal income. As with total income migration explains roughly 50% of the response of nonmanfuatruig income to the wartime contract spending shock. Migration also explains the slower growth of capital income during the war. The direct effect of the fiscal policy shock, together with migration, explain the recoversion response of capital income while the direct effect of wartime fiscal shock explains the long run effect of the war on capital income.

¹Referred to as simply "nonmanufacturing income" in the rest of the paper.

The existing research compounds a long standing disconnect between the popular assumption that "WWII ended the Great Depression" and the fact that no clear mechanism explains how that happened. Fishback and Cullen (2013) find no county level growth in economic variables. Jaworski (2017) finds no effect of wartime investment spending on long term economic development in the south. As well, Paul Rhode (1994, 2003) finds that west coast states, particularly California, experienced extensive economic growth due to the war but no long term change in their industrial composition. Further, the dynamics of war spending itself makes it difficult to identify a clear mechanism for how the war undid the secular stagnation of the Depression. The war had a large, but ultimately temporary effect on manufacturing, a fact evident in the response of manufacturing income to wartime contract spending discussed below. Despite the fact that military spending remained elevated after the war, the industries that saw the largest boom in employment, aircraft and shipbuilding, saw a collapse of demand at the end of the war. It was just not possible for domestic civilian or foreign demand to make up for wartime government demand of planes and ships. Employment in these industries increase from 118 thousand in 1939 to a peak of 2.25 million in 1943, but the end of 1947 employment in these industries had contracted to 285 thousand (US Dept of Commerce, 1949). The temporary nature of the wartime shock is likely why Rhode finds no long run changes to the industrial structure of the west coast and Jaworski finds no long run change in southern industrial development. As well, as Alexander Field (2019) points out, if anything, war spending had a negative effect on productivity. The industries that saw the largest productivity gains during the war shrank back into relative irrelevancy in the aggregate after the war.

The negative nominal income multiplier in this paper, on the other hand, elucidates the mechanisms that explain how the war alleviated the the economic pathology of the Depression. As Robert Higgs (1999) points out, WWII did not permanently increase the level of potential output relative to the pre-war trend. To put this differently, as Field points out, war spending did not provide a meaningful permanent boost to production on the supply side. Rather, WWII was a shock that lifted the economy out of the chronic, below potential, hysterisis of the Depression (Mathy, 2018). This more productive use of the labor force—and the corresponding increases in per capita income—set the economy back onto it's pre-Depression trajectory. The relative multipliers in this paper show that out-migration played as large role as the direct fiscal shock to manufacturing in state income trajectories. To do so I use a simple fixed effects specification, with state and year dummies to establish the basic dynamics of the war's effect on personal income. The central identifying assumption is the sheer size of the shock. On average total contract spending is 211% of of average state personal income in 1940, which accounts for almost all of the variation in the economy at least through 1947. It is well known that consumption hovered around its 1939/1940 level throughout the war (Higgs, 1999; Edelstein, 2000) and that private investment, both business and residential, was almost totally crowded out. After the war ends, the reconversion period 1945-1949 is characterized by two mild reconversion recessions driven entirely by the contraction in military spending. Under the assumption that the war is a large exogenous shock, there are two main potential sources of bias for the effect of contract spending. Rhode et al (2017) find that political distribution of contracts is not a source of bias, but that war shocks are correlated with state industrial structure. The state fixed effects controls for aspects of industrial structure that do not change over time. Since industrial structure across states is highly correlated within census divisions I control the evolution of industrial structure over time by including an interaction of a time dummy with census division dummy (Allegreto et al 2011). Tests for "historical edogenity" find that the shock of the war, controlling for industrial structure, is not correlated with income variables. Finally, since my panel extends to 1957, I control for the shock of the Korean War—which is highly correlated with the WWIIshock—after 1950.

Using this FE specification I establish the following pattern of income response: total income grows 11% slower by 1957 in a hypothetical average state that receives an average amount of war spending. Such an average state would see manufacturing income 34.2%

higher in 1943, but this temporary growth effect completely dissipates by 1946. In contrast, nonmanufacturing income growth in an average state would be 10.8% lower in 1944 and 15.3 lower in 1957.

As well, I find a substantial, negative response of ownership income to the shock of the war. By 1957 an average state receiving an average amount of war spending would see capital income (interest, dividend and rental income) 31% lower in 1957. Nonfarm proprietor income would be roughly 11% lower, though this result is less statistically robust than the response of capital income. Evidence from state level corporate income reinforces the evidence from personal income. Post-tax net corporate profits in an average state grow 53% slower in 1951. This slower growth in profits is reflected in retained earnings, which grow 7% slower in an average state. Dividends also grow more slowly in response to the war shock, as much as 400% slower in 1947, though this number is difficult to interpret given the wide fluctuation in the growth of dividends over the business cycle. To the extent that state level dividends paid out by corporations is comparable to state level personal capital income, the behavior of dividends explains roughly 1/3rd of the total capital income response to war spending. Bossie (2020) shows that interest payment growth, at least from national banks, is not different across states in response to war spending, but most of the difference in commercial bank balance sheet growth comes from demand deposits. Give the Regulation Q prohibition on interest payments for demand deposits it makes sense that local interest income was close to zero. This implies 2/3rds of the capital income response is from rental income. This is consistent with the effect of rent controls during the war found in Fetter (2016). He finds that rental controls both lowered relative rent payments and also induced landlords to sell. This would permanently reduce per capita rental income.

To decompose the underlying mechanisms through which the war affected income I employ mediation analysis using a three equation structural equation model (SEM). This SEM model is identified under the same exogenity assumptions as the FE model which is incorporated in SEM model. This SEM technique can be thought of as analogous to VAR variance decomposition with a Cholesky ordering of war spending \rightarrow migration \rightarrow income. The migration variable use here is "excess migration" from 1940-1947 above the across state migration experienced during the depression migration trend of 1935-1939.

This decomposition process shows that the decline in total income can be equally attributed to both the direct fiscal effect and the indirect effect the war had on across state migration. Slower growth in nonmanufacturing income is explained in equal parts by the fiscal and migration effects during the reconversion period. However, only migration has any statistical explanatory power after 1950. The effects across nonmanufacturing industries is heterogeneous and is concentrated in transportation and public utilities payrolls as well a wholesale an retail trade payrolls. There is also a statistically weak effect of migration on mining payrolls. In contrast, during the reconversion process the direct fiscal effect is the sole driver of the slower growth of retail payrolls in response to the wartime shock.

The interplay between fiscal and migration effects on ownership are also complex. Slower growth in personal capital income is driven by migration until 1949. After 1949 the direct fiscal effect dominates, at least in a statistically significant sense. Nonfarm proprietor income, on the other hand, only shows a long run (post-1949) slower growth attributable to migration. The response of corporate profits is similarly heterogeneous, with the slower growth of retained earnings being driven by the direct fiscal shock after the war but slower paid out dividends are being entirely driven by war spending through migration.

To understand my empirical findings it is useful to flip the sign of the negative war spending multipliers presented below and to keep in mind that slower relative growth in nominal income in war spending states means that states that did not receive war spending grew faster² The interplay between the negative shock of the war through both the direct fiscal shock and mediated through migration is best illustrated by Figure 1a which shows the relationship of war spending and income growth from 1940 to 1947. States are also

 $^{^{2}}$ It is helpful for expositional purposes to present a dichotomy between states that received war spending and those that didn't. However, all 48 states received at least some war spending. North Dakota received the smallest amount of total contract spending at \$16.93 per capita.

grouped by whether they experienced in-migration or out-migration. Average per capita income growth in the US between 1940 and 1947 was 123%. The 28 states with net out-migration had per capita income growth of 166% while the 20 states with net in-migration had an average growth of 115% from 1940-1947. All states during this period experienced rapid nominal income growth, but as Figure 1a shows, states with net out-migration are largely clustered in the bottom right of the graph having received lower levels of per capita war spending but also experienced faster income growth.

While I show clearly the transmission channels of the fiscal policy shock of the war through both the direct fiscal shock and the indirect migration induced by the war, I remain agnostic about the underlying mechanism driving the fiscal and migration effects. Historical evidence and the patterns of response offer some suggestions for how the the war spending shock affected income through fiscal and migration channels. There are two main things driving the fiscal response. The first is that the direct shock to manufacturing brought with it the heavy hand of the federal government. The political economy of the war shock itself, greater union membership, and the various government agencies that oversaw labor conditions such as the National War Labor Board (NWLB) (Farber et al, 2021) and the Fair Employment Practice Committee (Collins, 2001) had a distributional effect towards labor. However, this only potentially explains the dynamics of capital income during the war. Also important in considering the longer term effect of war spending is that the temporary effect of the war ended in two post-war recessions between 1945 and 1949 that saw employment in key wartime industries, specifically aircraft manufacturing and shipbuilding collapse. With postwar civilian demand, only a tiny fraction of federal government demand the collapse in these industries was permanent and one would expect both labor and/or capital income in states that housed these industries to be lower as a result.

Migration also likely operated through two separate channels, which are difficult to distinguish with the evidence presented here. If migrating workers earned average income in the states they migrated to-producing no intensive growth in income in war states-you would expect a negative multiplier for two reasons. First, workers with below average wages leaving a state would increase per capita income mechanically in out migration states ceteris paribus. This compositional effect would be seen even most strongly in per capita ownership income under the reasonable assumptions migrants did not poses much in term of income earning assets. The assumption that migrating workers earned lower than average incomes, however, is not backed up by the historical evidence. Boustan (2017) shows that higher skilled workers were more likely to migrate from the south to the north. However, I believe we can take the assumption that even higher skilled workers did not receive much capital income as reasonable.

The second reason we would would expect per capita nominal income for workers to increase faster in states with out migration would be due to the shift of the labor supply curve in those states to the left. These evidenced in the effect of migration on transportation, utility and communication as well as wholesale and retail trade payrolls can be interpreted as providing supporting evidence for both migration mechanisms. However, the additional added evidence from the strong effect migration has on state and local wages and salaries as well as the effects of migration on dividends offers, I believe, evidence for the compositional effect of out-migration migration under the assumption that the level of dividend payments and state and local spending is not responsive to changes in population. This assumption is easiest to make for corporate dividends as one assumes the level of corporate distributed profits is largely exogenous to population.

Finally, I show a surprising response of farm income to war spending. Farm wages are not, in statistically meaningful way, affected by either migration or direct spending. Farm proprietor income, on the other hand shows a relatively strong statically significant response to the direct fiscal effect of the war. The lack of an across state migration effect on farm incomes is striking given the historical narrative that lack of postwar farm labor lead to structural changes in farming techniques (Grove, 2000 for instance).

2 Historical Background

It is important to bear in mind that the empirical results show "relative open economy multipliers" and measure differences in relative growth rates of state level income in response to war spending. Income growth during the war was robust in all states. Per capita nominal income growth for the whole US from 1940-1947 was 123.3%. This paper deals in nominal income because there are no credible state level deflators available. A crude estimate of the proportion of this change that is a change in prices and what proportion is a change in real income growth. it makes the most sense to look at the behavior of nominal income and prices from 1940 to 1947 becuase it is not until 1947 that the full inflation of the war manifested itself during the decontrol process. The CPI increased from Jan 1940 to Jan 1948 by 43% suggesting real per capita income in the US grew by 80% between 1940 and 1947. Another way to think about this is that for the nominal results below one can make a rough assumption that 2/3rds of the relative multipliers represent disparate growth in real variables.

To the extent that the wartime inflation was local, this average national inflation rate probably overstates inflation in states losing migrants. While income increased on average for those who remained it is unlikely their increased demand for food—a major source of national WWII inflation from 1940-1947—increased enough to offset the decline in food demand as migrants leave. Second, the inflationary effects on housing of migration into war spending states is well know. This effect is ambiguous, though. There likely would have been a relative disinflationary effect on housing in states with net out migration and sometimes an absolute decline in population during the war. However, rent control in war centers would have slowed down the inflationary impulse of housing shortages in war production centers (Fetter, 2016) Coming at the relative inflationary effects from another angle: Bossie (2020), using a similar empirical strategy as this paper, shows an increase in deposits in local banks that is roughly the same magnitude as the increase in income presented here. This suggests that this excess growth in income in states not receiving war spending was primarily saved. This did not result in increased local lending—deposit increases were held as paper assets, namely Treasury bond and reserves. This short circuit between the increase in the local money supply without an increase in local lending would have mitigated the potential inflationary impact of the excess growth in income in non-warspending states.

Figure 1a shows the simple correlation between war spending and total income as well as war spending and capital income. On thing that stands out immediately is the size of the shock. States on average received per capita war spending shocks that were 211% of 1940 per capita income. Michigan receiving the largest per capita proportion of contracts at 582% and North Dakota, who only received about \$16.93 in war spending per capita, or 4.8% of 1940 per capita income. Income growth from 1940 to 1947 was also large, with average state level growth at \$145.12 over those seven years. It is clear from 1a that states with out migration experienced faster income growth, but it is important for the reader to bear in mind that the growth rate of income across all states was very large. What the negative across state relative multiplier captures is the faster growth in states with less war spending (and, generally, more out-migration).

Figure 1b shows the relationship between war spending and capital income. The fit line for war spending and capital is steeper than the relationship between war capital and total income. However, the slopes are statistically indistinguishable from each other. One thing of note is that the partitioning of in-migration and out-migration states is less clear for capital income than it is for total income. On average capital income increased by 75.8% across states from 1940-1947. One state, Delaware, actually experienced a small contraction in capital income of -2.7%. South Dakota and North Dakota, who received very low levels of war spending, saw the largest increases in capital income of 168% and 165% respectively.

Figure 2 shows the relationship between migration, income, and war spending more directly. The negative correlation between migration and income is obvious from Figure 2a. States with out-migration on average had out migration of -9.5%. North Dakota experience the strongest out-migration with over a quarter of the 1940 population leaving the state.

States with positive rates of migration experienced in-migration of 10% of 1940 population. Oregon and California both saw in-migrations above 30% of their 1940 populations. Figure 2b simply reinforces the expected positive relationship between migration and war spending. On average, for every 1% increase in war spending relative to 1940 income migration increases by 0.047%.

This paper remains agnostic on exactly how migration affected relative income growth. There are two possible channels one can speculate on through which migration could affect income. First, is a simple compositional effect. The effect of migration on capital income during the war offers a useful example. If relatively low wage workers who are not wealthy enough to own assets migrate this would mechanically increase the share of per capita capital income. The empirical evidence below also points to a nonuniform effect on wages and salaries across non-manufacturing industries. One possible explanation is that some industries had lower "replacement elasticities". In this case out-migration might have caused employment to grow slower in some industries. A second obvious labor market effect of out-migration is the shifting of the labor supply curve to the left. The dynamics of this are of some interest. Boustan (2017) points out that it was relatively higher skilled workers who migrated out of the south. This is of interest in light of the findings here of no effect of across state migration on agricultural wage growth. One possible explanation might be that farm workers were more likely to migrate within state to replace skilled workers who migrated out of state. There is potential overlap from this explanation with the compositional effect under the assumption that some industries could not find adequate replacement for skilled workers who left.

The second way in which migration can affect relative incomes is through shifting the labor supply curve in out-migration states to the left. Again, the effect of the shifting supply of agricultural labor is ubiquitous in the historical literature but I find no evidence for there to be an across state migratory effect on farm incomes. Further, as this paper shows, the outmigration effect is only evident in some industries. That is, it is not clear that the aggregate labor supply curve shifted (relatively) to the left in response to out-migration. Rather, the out-migration effect is concentrated in transportation and communication, wholesale and retail trade, and state and local government payrolls. Again, what is driving the outmigration effect remains an open question.

It is also useful to discuss the various factors underlying the "direct" effects of the fiscal policy shock. Here we are most interested in explaining the behavior of the personal capital and corporate income responses to the shock. There are a number of overlapping factors that can generally be labeled the "political economy" factors. One possible limiting factor is that the impact of the war shock is limited by supply constraints. Brunet (2022) argues the small and or negative relative multipliers could be driven by the fact that the huge shock of the war simply pushed the economy up along the aggregate supply curve. This would mitigate the per dollar effect of war spending as it pushed against hard local supply constraints. Outside of supply constraints, the strong labor market was a significant channel of redistribution from capital to labor (Bossie and Mason, 2020). The strong labor markets of the war also provided a strong tailwind to the post-Wagner-Act increase in union density. The strong hand of the Federal Government also encouraged the increase in union density to keep industrial peace. The Federal government also intervened directly in wartime labor markets in other ways. Much of this was aimed directly at companies receiving war contracts through such devices as the National War Labor Board (Farber et al, 2020). As well, the Fair Employment Practices Committee discouraged defense contractors from racial wage discriminating, limiting the ability of defense contractors to increase profits through discriminatory wage policy (Collins, 2001). While this paper does not show a difference in corporate taxes, across state corporate profits were controlled by other means. Wilson (2010) argues that the military was quite conscious of war profiteering and often clawed back profits from firms they believed received profits that were too high. Rent controls similarly limited profits for landlords in boom cities (Fetter, 2016).

However, these factors only explain the temporary wartime economic effect. Much of the postwar differential in growth rates can also be traced to the way in which the temporary shock of the war dissipated during the postwar business cycle adjustment back to civilian production. Table 1 makes the basic point that during the postwar reconversion employment in both aircraft manufacturing and shipbuilding collapsed, with employment in both industries shrinking by over 80% by the end of 1948. This decline in employment was permanent in those industries, since there was simply no way civilian markets could make up for military demand. This collapse in employment can also be thought of as a proxy for what happened to ownership income in those industries.

3 Baseline Empirical Results

3.1 Empirical methodology

The basic empirical model and military contract data used to study the effect of WWII military contract spending on the income (and the components of income below) is the same as that used to study the response the effect of WWII on county level southern industrial development in Jaworski (2017) and the effect of military contract spending on state level bank balance sheets in Bossie (2020).

The basic empirical specification is as such:

$$INCOME_{it} = \beta_{1t}(y_t * WWII_i)s_i + y_t + \delta_{1t}(y_t * CENSUS_i) + \delta_{2t}(y_t * KOREA_i) + \epsilon_{it} \quad (1)$$

All variables are population adjusted and in $\log s^3$. $INCOME_{it}$ is a personal income variable: total income or its sub-components. This specification includes a dummy variable each for state (s_i) and year (y_t) . These control for time invariant individual state characteristics as well as policy changes across years. This paper, as with the other two papers mentioned, can be seen as employing a variation of the methodology used in Nakamura and Steinsson

 $^{^{3}}$ It should be noted that it is occasionally necessary to add one to a variable to make log transformations tractable. When this is necessary it will be noted in the text.

(2012) to calculate state level "open economy" or "relative" fiscal policy multipliers. The effect of interest is β_{1t} which captures the effect of $WWII_i$ contract spending interacted with a time dummy. The contract spending variable, $WWII_i$, is a single observation of total contract spending per state. $WWII_i$ includes military contracts of \$50,000 or more for the period June 1940 - September 1945 (Haines, 2010). There is also data on military contract spending for some subcategories of contract spending. Total war contract spending can be broken down into four subcategories and so it makes sense to explore the differences in the effect of plant and equipment spending. In this section the focus is on total war spending. These subcategories should be thought of as contracts for investment spending, production of durable and nondurbable goods, and government military infrastructure respectively. One challenge of the data is that the wartime contract spending variable is time invariant.

Normally, when estimating an interaction effect it is common practice to also include the "main effect" as well as the interaction effect in the estimate of a total effect. However, the time invariance of $WWII_i$ makes it pointless to include it individually as time invariant state level variation is absorbed by s_i . This does not pose a problem for our estimate because the effect of the contract spending variable is captured adequately by the interaction with the time dummy. The concern of this paper is the change in the components of income for 1941 to 1957 relative to 1940 attributable to war spending and the interaction effects captures this when we drop the 1940 year dummy. As well, since the state fixed effects already includes the variance of time invariant war spending variable it does not provide any new information to the regression. Given that the individual effect of $WWII_i$ is neither material to the question of interest nor useful in controlling for variation in our regression, not including the individual effect is costless. Additionally, $KOREA_i$, a single observation of total war spending per state is included to control for the effect of the secondary shock of the Korean War (Secretary of Defense, 1962). This variable is zero before 1951 and positive through 1957.

There are two main sources of potential endogeneity that have been well discussed in the literature (Jaworski, 2017; FC, (2013); Bossie, (2019); Rhode Snyder and Strumpf (RSS, 2017)). The first is potential endogeneity from the political process of spending allotments. As with all types of fiscal spending, political considerations potentially play a role in the distribution of military contract spending. The second source of endogeneity comes from the fact that the contract spending shock was largely a shock to manufacturing in urban economies and thus war spending is endogenous to the existing industrial structure of a given state. Borrowing from the minimum wage literature (Allegretto et al, 2011), where the confounding effects of industrial structure are a similar concern, I have included a dummy variable for Census districts $CENSUS_j$ interacted with a time trend to capture changes in industrial structure over the time. The census and state level dummies provide adequate control for geographical difference in industrial structure.

Political considerations, on the other hand, did not seem to play a strong role in the allocation of military contracts. Koisenstien (2004) argues that military control of production removed, to a significant extent, the role of politics in deciding where military counteracts would be sourced. Rhode et al (2017) confirm this empirically. However, both authors find that industrial structure was a major determinant of contract spending. This is perhaps obvious. Speed of production was the overarching concern of military planners and so production was centered largely where production capacity already existed. The main role of the state fixed effects is in controlling for the existing industrial structure of states in 1939. This is, of course, likely to be a imperfect device. Appendix B is dedicated to establishing that, given the fixed effects specification used here, the shock of the war can be reasonably assumed to be an exogenous shock to total personal income. This claim is based on a test for "historical endogeneity". Simply, the regression in Equation 1 is run backwards on the period 1929 to 1940, with the 1940 year dummy excluded (and without the Korean War variable). This allows us to measure the correlation of income variables from before the war with the WWII contract spending shock. In general, as Appendix B establishes, correlation between the 1930s and WWII contract spending is not of much of a concern. However a potential issue that state level fixed effects does not address stems from the fact that states with different industrial compositions are also likely to experience different post-1940 trends.

There are two other possible issues when thinking about the effect of the war on the two very different (war and postwar) subperiods. First, the operating assumption is that the single observation per state is a reasonable proxy for annual wartime spending. If that assumption does not hold then estimates are likely to be biased. However, comparing the single observation of total contract spending to data from preliminary estimates of annual contract spending as well as annual "war industry" payrolls suggest that the single observation of total spending is a reasonable proxy for annual spending during the war. Appendix A of Bossie (2020) shows comparisons between the single observation per state and annual contemporary wartime spending for 1940-1945 and shows that the single observation per state produces comparable estimates to annual series. This is particularly true for the more complete war industry payrolls series. As well, Appendix A of this paper establishes that estimates for the full 1939-1957 period also hold when the full period is divided up into a war (1939-1945) and a postwar (1946-1957) periods.

It should be pointed out that while there is readily available data for all variables for the District of Columbia, it has been dropped from the analysis. The effects of war spending on income and the components of income are systematically different when DC is included. The fact that DC can obviously be regarded as a special case given that it is both not a state and the seat of the Federal Government means it is reasonable to drop DC as an outlier.

3.2 The Response of total income and private income

The negative effect of wartime contract spending on total income is economically and statistically robust. Of more interest here is the effect of contract spending on the nonfarm private economy. Wartime contract spending generates a temporary positive growth effect on manufacturing during the war. Nonmanufacturing income, meanwhile, grows more slowly in states that receive war spending. This negative growth effect of the war on nonmanufacturing income carries through until 1957.

Figure 3 shows the response of total personal income to war contract spending as well as the response of private income divided up into its major components: manufacturing and nonmanufacturing income. Following Higgs (1999) the focus of this paper is on the effect of wartime contract spending on private income. However, it is of interest to to look at the response of total income to total war spending. Results from total war spending are presented in two basic ways. First is the per dollar multiplier. As you can see from the first panel of 3 nominal per dollar multipliers are negative and small. The war contract effect on total income peaks in 1956 at -15.7 cents per dollar. However, the shock of the war was so large that this small per capita dollar multiple translates into a large total effect. To capture the total size of the effect of the war on income it is useful to show the growth differential of an average state receiving and average amount of war spending. For instance, total per capita average state income in 1956 was \$1991.93. Average total wartime contract spending was \$1233.67 in 1940 per capita terms. The implied total effect of the war shock on an average state receiving an average amount of war spending was to slow total income growth by 14.1%. This measure is somewhat crude and contains some double counting, since the effect of the war is already included the average state level income. However, such a measure is necessary for clearly communicating what I shall refer to as the "average total relative growth effect" of a large shock that has a small per dollar effect. From the first panel of 3 it is clear that the effect of war spending is immediate and negative. The total relative growth effect peaks in 1947 with an implied slower growth of total per capita income of 20.5% (12) cents per dollar). The peak multiplier effect of 1956 is somewhat misleading as to the long run effect of the war on total income. On average from 1949-1957 the multiplier is -11.5 cents and the total relative growth effect on total income is -12.3%.

The second panel of Figure 3 shows the effect of total war spending on private income. It makes sense to focus on private income because there were also large expansion of the federal government, both in military terms and in terms of nominal transfers. These nonprivate sources of income as well as the dynamics of farm income (discussed below) add noise to estimates of the "development effect" that wartime spending had on the private economy. The effect of total wartime contract spending on private income is significantly different during the war than the response of total income. First, private nonfarm earnings shows a small but positive wartime multiplier in 1942 and 1943 of -2.1 and -2.4 cents per dollar respectively. After the war the relative growth effect is negative. Given the multiplier estimates for total income above, the average 1949-1957 multiplier of -8.9 cents per dollar of war spending for private income suggests a large portion of the total income effect is accounted for by the effect on private income.

The bottom two panels of 3 further break down private income between manufacturing and nonmanufacturing nonfarm earnings. The response of manufacturing income is drives the positive wartime private income response. The multiplier effect on manufacturing peaks in 1943 at 4.5 cents per dollar of war spending. An average state receiving an average total contract spending shock would see manufacturing income 34.2% higher in 1943. After 1943, however, the effect of war spending dissipates and the long term effect of the war on manufacturing income is statically zero through 1957. In contrast, by 1957 an average state would see its nonmanufacturing income grow 15.2% slower. While the response of total income contradicts the positive wartime relative multiplier in Brunet (2022), who shows a two year multiplier of 34 cents per dollar of supply contracts, the temporary positive response of manufacturing earnings here is smaller but in the same direction. The smaller effect makes sense, given the reliance in this paper of a single shock per state compared with the more detailed monthly data in her paper.

3.3 The response of personal and corporate ownership income

Both state level personal capital income and state level corporate income suggest a strong negative effects on the returns to ownership. The slower growth in nonfarm ownership income explains about 40% of the total post-1949 slower growth in total income. The response of corporate net income and profits is in line with state level capital income. State level dividend payments by corporations are negatively related, but much smaller than personal capital income. Personal capital income consists of three components: dividends, interest and rent. Under the weak assumption that dividend payments are paid within states we can estimate that dividend payments are driving about 40% lower growth of capital income both during and after the war. Bossie (2020) shows that, at least for national banks, the growth of interest rate payments by banks on deposits is not different across states. The dividend and interest rate effect of state level was spending thus suggests that roughly two thirds of the dynamics of personal capital income are being driven by rent payments. This estimate is consistent with Fetter (2016) who argues that rent controls, more likely to be implemented in wartime boom cities, lowered the return to renting housing and to higher levels of home ownership. Both the lower direct return to renting and the mechanical effect of per capita landlord holdings drove down per capita rental income. Again, the conclusion that capital income is driven by rental income should be considered very tentative and there is some contradictory evidence presented below.

The first panel of Figure 4 shows the response of total nonfarm ownership income to total war contract spending. The response pattern is similar to that of nonmanufacturing income in that per dollar nominal growth of nonfarm ownership income gets slower over time. In 1944 nonfarm ownership income is -1.6 cents slower per dollar of war spending and by 1957 nonfarm ownership income growth is -6.3 cents slower. The average total relative growth effect varies less with ownership income is 21.5% lower in 1944 and 23.2% lower in 1957. The trends for capital income and nonfarm proprietor income follow the same trend as total nonfarm ownership income with the response of capital income to to total war spending is stronger, both economically and statistically, than the response of nonfarm proprietor income.

The second panel of Figure 4 shows the response of capital income to total wartime con-

tract spending. In 1944 capital income is 0.8 cents lower per dollar of war spending. By 1957 the nominal per dollar effect had increased to -4.6 cents per dollar. However, the average total relative growth effect in 1944 reduced capital income by 46% in an average state. This total effect is reduced to 31.4% by 1957. The effect of war spending on nonfarm proprietor income is much smaller. The multiplier effect of contract spending is not statistically significant and above 1 cent per dollar until 1953. This small effect translates to a fairly stable average relative growth effect of was spending on nonfarm proprietor income of -10% between 1944 and 1957.

Figure 5 shows state level corporate income, based on data collected from the IRS Statistics of Income II for 1940-1951. The effect of war spending on corporate income follows Equation 2. The results for corporate income should be approached with caution. First, the state in which a corporation registers need not be the state where most of it's income, or dividend payments manifest. To this end, Delaware, along with DC, has been dropped from the analysis of corporate income. Second, the panel for corporate income is limited to 1951 and thus only captures the medium term response of corporate income to the wartime shock.

Net income, post-tax net income, and retained earnings all display a similar response to total wartime spending. A slower growth of pre-tax and post-tax earnings is only evident after the war, as is a differential in the growth of tax payments (not shown). The average total relative growth effect shows a average slower growth of post-tax corporate earnings of 51% between 1946 and 1951. Retained earnings are statically below zero even during the war: lower by 1.5 cents per dollar of war spending in 1943 and 3.2 cents lower in 1951. Of interest, the total average growth effect suggest that corporations in an average state would have retained earnings that were 45% lower in 1943 and 69.1% lower in 1951. While the multiplier effect on per capita corporate dividends is relatively small, only larger than -1 cent after 1948 the total average growth rate of dividends is very large. Dividends are 92% lower in an average state receive average war spending. However, total per capita dividends

fluctuate significantly and so this estimate should be approached with caution.

One further point should be noted regarding the dynamics of the corporate and personal capital income. It is clear from Figures 4 and 5 that there is wartime crowding out of corporate and personal profits. In addition to this wartime crowding out retained earnings and capital income also experience a significantly slower growth during the postwar business cycle. From 1944 to 1947 the per dollar effect of war spending increases from -1.4 cents to 4.3 cents. The total average growth effect. The change in the total average growth effect is less dramatic, from -47.6% in 1946 to -55.1% in 1948. The behavior of capital income and profits suggest that the direct of war spending on output is a complex phenomenon driven by both wartime capital crowding out as well as the business cycle effects of the postwar structural adjustment away from wartime industries.

4 The direct and migration effects of war spending on income

4.1 Empirical methodology

In this section I turn to the underlying mechanisms that is driving the response of income to war spending. The war had an obvious direct effect on output, but as discussed above migration plays a clear role in the across state response of income to war spending. To disentangle the effects of migration from the direct fiscal effects the following system of equations is estimated:

$$INCOME_{it} = \beta_{1t}(y_t * WWII_i)$$

$$+ s_i + y_t + \delta_{1t}(y_t * CENSUS_j) + \delta_{2t}(y_t * KOREA_i) + \epsilon_{it}$$

$$MIGRATION_i = \alpha_1(WWII_i) + \delta_{3t}CENSUS_j + \mu_i$$

$$INCOME_{it} = \beta_{2t}(y_t * WWII_i) + \alpha_{2t}(y_t * MIGRATION)$$

$$+ s_i + y_t + \delta_{4t}(y_t * CENSUS_j) + \delta_{5t}(y_t * KOREA_i) + \sigma_{it}$$

$$(2)$$

Equations 2 to 4 are estimated as a simultaneous equation model (SEM) to evaluate the relative explanatory power of both the direct and migration factors. Other disciplines refer to this technique as mediation analysis (Barron and Kenny, 1986). For economists it likely makes more sense to think of it as a variance decomposition with a Cholesy order: war spending \rightarrow migration \rightarrow income. Standard errors for this system of equations are clustered at the state level and calculated by the delta method. This produces our three estimates of interest: A total effect(β_{1t}) that has already been discussed at length above. This total effect is decomposed into the direct effect of war spending on income (β_{2t}) and the effect of war spending on income that is "mediated" through migration ($\beta_{1t} - \beta_{2t} = \alpha_1 \alpha_{2t}$). The direct and migration effects are identified under two conditions. The same assumptions of exogenitey of the war shock from the total effect in Equation ??. The Cholesy ordering assumption which is that migration is the only "nonfiscal" mechanism through which war spending had an effect on income.

 $MIGRATION_i$ is the "excess migration" from 1940-1947 (Census, 1948) in excess of migration from 1935-1939 (Census, 1946). This controls for migration from 1935-1939 as the "steady state" migration pattern of the Depression that is disrupted by the shock of the war. Both periods of migration are as the percentage of civilian migration relative to their base year populations (1940 and 1935 respectively). Data is available for migration from 1940-1945, which at face value is more comparable to the earlier migration panel. However, statistics for 1940-1947 are more reliable, as well, since the concern here is largely with the long term effect of the war shock, net migration of 1940-1947 better captures the total shifting of migrants as it accounts for the post-war reconversion migration at the end of the temporary wartime employment shock.

In the original specification $WWII_i$ is total war spending. This is done to keep the results consistent with those in Bossie (2020). When decomposing fiscal and migration effects, however, $WWII_i$ excludes military facilities spending (about 8% of total spending). This does not effect the dynamics of the total effect significantly (presented below as elasticities and not multipliers) but it does have some implications for the direct and migration effect. Including military facilities spending tends to exaggerate the direct effect of war spending since facilities spending went to the building of government owned infrastructure. As with above, the focus here is on the effects of contract spending on long term private economic development and so it makes sense to exclude the economic effects of direct government spending. To be clear, $WWII_i$ in the SEM specification is "private" contract spending that includes supply contracts, equipment supply contracts and plant and equipment contracts.

4.2 Total income, manufacturing, and nonmanufacturing income

Figure 6 shows the total, direct and migration effect of private war contracts on total income and manufacturing and nonmanufacturing income. Total income is included to establish a baseline pattern for the response of the economy to war spending shocks both directly and mediated through migration. When discussing the migration and direct effects it is helpful to divide our results into three broad periods. The first is the war period (1941-1945), the second reconversion period (1946-1950), and the third long run (1951-1957). The direct effect of war spending dominates during the war, explaining on average 93% of the total effect. During the reconversion period there is a shift in the explanatory power of the variables so that by 1951 both the migration and direct effects after 1950 is statically marginal,

but the consistency of the responses after 1950 suggest that both the direct effect and longer term effect have equal shares in the determination the evolution of the long term response of total income to private war contract spending.

The bottom two panels of Figure 6 show the response of manufacturing income and nonmanufactruing income respectively. The temporary shock to manufacturing is dominated by migration, which explains about 60% of the total effect. It is also somewhat difficult to make causal claims about the effect of migration on manufacturing income. This is due to a weakness in the SEM specification above. For the war period, it makes sense to include a lag of income. Much of migration would be driven directly by war spending, but migration would also be driven by a general increase in income. However, including a lag of income produces a well-known consistency problem. As well, the coefficient on lagged income absorbs most of the variation in current income. As such, the migration and direct effects on manufacturing income should be consider correlational and not causal. At any rate, the migration effect is not statically significant. The direct effect, on the other hand, is statistically significant at the 5% level for the first two years under consideration (for 1943 the p-value is 0.0507) and thus we can more reliably make correlational claims about the wartime direct effect of war spending on manufacturing, at least during the 1940-1943 buildup of productive capacity.

The effect of private war spending on nonmanufacturing nonfarm income is fairly precisely estimated at zero during the war. Early during the transitional reconversion period, the direct effect is statistically significant; by 1948, the migration effect is also statically significant and stays significant through the end of our sample. As with the total income after 1948, the direct and migration effects explain equal parts of the effect of the war on nonmanufacturing, though from 1951-1953 migration explains around 70% of the effect on nonmanufacturing income before settling back into a more even split in the explanatory power of the migration and direct effects.

We have detail on the different sectors that comprise nonmanfucturing. Given the role of migration in slowing the growth of nonmanufacturing income, the focus here is on wages and salaries and not total income in these industries. Most striking from Figure 7 is the heterogenity in the response of the various selected components of nonmanufacturing wages and salaries to the direct and migration effects. Wholesale trade and transportation and utilities show the strongest response to migration, though in both cases this is a post-1947 response. It is also notable is that during the reconversion period the direct effect, likely driven by business cycle dynamics, dominates the response from these two sectors. However, after 1950 there is a fairly precisely estimated zero direct effect of war spending on the two industries.

Mining is worth discussing because Brunet (2022) argues that mining is a potential source of bias in relative state level multipliers because contractors who needed raw materials would need to contract across state lines. First, the relatively precise zero estimate of the total effect of private war spending on mining⁴ suggests that this is unlikely a source of much bias. Second, this zero estimate is the product of complex underlying effects. The direct and indirect effects have opposite signs. The direct effect, however is not statically significant. The migration effect is only marginally significant but it does provide us with some suggestion that slower growth in mining wages and salaries are being driven by out migration all other things equal.

Services payrolls are included because they behave very differently than the other three nonmanufacturing subindustries in Figure 7. The response of services wages and salaries is driven, during reconversion at least, by the direct effect. Under the assumption that whole-sale trade and transportation and utility workers were higher skilled than service workers, along with the lack of across state migration effect on farming wages (discussed below) this lends support to well know migration patterns in which relatively higher skill workers and/or educated workers (Boustan, 2017; Collins, 2007) were more likely to migrate, at least out of the south.

⁴A 1 has been added to mining wages and salaries to make the log transformation possible

4.3 Personal and corporate capital income

The dynamics of the effect of war spending directly and through migration on ownership income are are also complex. Figure 8 decomposes the total effect of private war spending on capital income and nonfarm proprietor income. The migration effect drives the response of capital income to war spending throughout the war and into the reconversion period. However, after a relatively small and immediate effect at the start of the war, the effect does not evolve very much through 1957. During reconversion the direct effect is more dynamic. This is consistent with the "business cycle" explanation for the behavior of capital income. This "business cycle" effect is permanent and carries through to 1957.

Nonfarm proprietor income is of interest because, like mining, it shows a complex interaction of direct and migration effects. The reader will notice that the total effect is only statistically significant, more or less, for the reconversion period. Around 1947 the direct and migration effects diverge, with the direct effect positive but not statistically significant. The migration effect becomes consistently statistically significant after 1950 and produces a larger effect than the total effect once the direct effect is factored out.

The long run direct effect of the war on capital income is consistent with the the direct effect on retained earnings shown in Figure 9. The total effect of war spending on retained earnings is being driven by the direct effect after 1945. Somewhat surprisingly, per capita dividend payments are driven very strongly by migration effects. The reader will notice that the direct effects of dividend payments is positive (though not statistically significant). I take this relationship between dividends and migration to be strong evidence of a compositional effect of migration. Here, I make the assumption that the relative level of dividend payments did not change that much and/or corporate behavior is relatively exogenous to population changes. If that assumption holds, then Figure 9 shows that the per capita level of dividends would be diluted by increased migration into states. Equivalently, per capita dividends would become more concentrated on a per capita basis in states with net out migration.

5 Empirical Effects of secondary interest: Farm and government income.

The total effect, direct effect, and migration effect on farm income⁵ is show in figure 10. The most striking takeaway from Figure 10 is that migration plays, for all intents and purposes, no role in determining the across state relative multiplier for farm income. In fact, Figure 10 shows a fairly precisely estimated zero effect of migration on relative farm proprietor income. Neither migration nor the direct effects of war spending show any significant relationship with farm wages and salaries. The direct effect of war spending seeing lower income of farm proprietors, with farm owners in states receiving war spending seeing lower income growth than farmers in nonwar states. The per dollar multiplier (not shown) is relatively small peaking at 1.4 cents per dollar during the war in 1944. An average state with average farm proprietor income would see income growth slower by 22%. The long term effect is even larger, in 1957 an average state receiving an average amount of war spending would see farm propriety income growth 45% lower. These estimates should be approached with some caution since farm proprietor income is one of the only categories to see an absolute decline in per capita income over the period under consideration here.

Nationally, farm income began to shrink in per capita terms after 1952. This effect may have been slightly faster in states that experience more war spending. However this effect is only statistically significant a decade after the war and so any causality of slower farm ownership income growth and the war is tentative at best. Generally speaking, the effect of war contract spending on farm earnings shown in Figure 10 reinforces the idea that farm income plays little role in explaining multiplier effects of the war. In fact a reasonable and likely interpretation for the direct effect of war spending on farm income is compositional.

Figure 11 shows the response of military wages and salaries along with wages and salaries for federal civilian and state and local governments. This has been included to make two basic

⁵All three farm income varibales have had a 1 added to them to make log transformation tractable.

points. First, military wages are not correlated geographically with private war spending contracts. Military wages could be a possible source of bias, but it is clear from the first panel of 11 they can be thought of as a separate economic phenomenon. The claim that federal civilian wages were not correlated with wartime private spending is somewhat weaker but it is similarly not much of a concern. The second point to be made is in the response of state and local government wages and salaries. As Figure 11 shows, the negative relative multiplier for state and local spending is being driven by migration. I believe this relationship is explained much in the same way as retained earnings. That is, the level of state and local spending is relatively population inelastic and so what Figure 11 is showing is a compositional effect from the dilution or concentration of state and local wages and salaries in in-migration and out-migration states respectively. This interpretation is perhaps somewhat complicated by the fact that during the reconversion period state and local spending show a clear business cycle response to direct war spending.

6 Discussion

I have shown that the war is a temporary positive shock to state level manufacturing but a permanent, negative shock to state level nonmanufacturing income. The permanent shock of the war to nonmanufacturing income offers an explanation for post-war regional convergence as well as a mechanism for how "WWII ended the Great Depression". Differential growth rates point to this permanent effect on nonmanufacturing income ended the hysteresis of the depression. While this is certainly a useful finding, it is also important to elucidate the underlying mechanisms that caused the changes in income. The slower growth in income from war spending is due in equal parts to the direct effects of the fiscal shock of the war and also indirectly through across state migration. The long run effect of the war on nonmanufacturing income is dominated by the indirect migration effect and is concentrated in transportation and utilities and wholesale and retail trade. About a third of the total effect of the war on personal income can be attributed to slower growth in personal capital income. The short term effect of the war on capital income is driven by the direct fiscal shock, but migration explains the slower growth in capital income in the long term. The results for state level corporate income should be approached with some caution, but the negative across state response of corporate profits correlates with the effect of personal capital income and suggests generally fast growth of per capita ownership income in states that received lower amounts of war spending.

The analysis here can be considered "wide" but not "deep" in the sense that it establishes a broad set of empirical facts about the effect of WWII and manages a coherent narrative about the complex underlying mechanisms by which WWII had an economic impact on the sustained postwar golden age. A s such, it offers a number of empirical facts that can serve as guideposts to future research. Most obviously, deeper analysis is called for regarding the effects of migration on income during the war. Now that the 1950 Census has been made publicly available that richly detailed cross section is likely provide much insight in how the shuffling of labor within and across regions during the war ended the Depression hysteresis.

References

- Allegretto, Sylvia A, Arindrajit Dube, and Michael Reich (2011) "Do minimum wages really reduce teen employment? Accounting for heterogeneity and selectivity in state panel data," *Industrial Relations: A Journal of Economy and Society*, Vol. 50, pp. 205–240, Publisher: Wiley Online Library.
- Baron, Reuben M. and David A. Kenny (1986) "The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations," *Journal of Personality and Social Psychology*, Vol. 51, pp. 1173–1182, DOI: http://dx. doi.org/10.1037/0022-3514.51.6.1173, Place: US Publisher: American Psychological Association.
- Bossie, Andrew (2020) "Monetary and fiscal interactions in the USA during the 1940s," *Cliometrica*, Vol. 14, pp. 61–103, URL: https://doi.org/10.1007/s11698-019-00182-1, DOI: http://dx.doi.org/10.1007/s11698-019-00182-1.
- Boustan, Leah Platt (2017) Competition in the Promised Land: Black Migrants in Northern Cities and Labor Markets, Princeton: Princeton University Press, URL: https://doi. org/10.1515/9781400882977, DOI: http://dx.doi.org/doi:10.1515/9781400882977.
- Brunet, Gillian (2022) "Stimulus on the Home Front: the State-Level Effects of WWII Spending," *Working Paper*, Publisher: University of California, Berkeley, job market paper.
- Bureau\of\the\Census (1946) "1940 Census of Population: Internal Migration, 1935 to 1940," URL: https://www.census.gov/library/publications/1946/dec/ population-internal-migration.html, Section: Government.
 - (1948) "Current Poulation Reports: Population Estimates," Vol. P-25, pp. 1–10.
- Collins, William J (2001) "Race, Roosevelt, and Wartime Production: Fair Employment in World War II Labor Markets," American Economic Review, Vol. 91, pp. 272-286, URL: https://pubs.aeaweb.org/doi/10.1257/aer.91.1.272, DOI: http://dx.doi. org/10.1257/aer.91.1.272.
- Collins, William J. (2007) "Education, Migration, and Regional Wage Convergence in U.S. History," in *The New Comparative Economic History: Essays in Honor of Jeffrey G. Williamson*: The MIT Press, URL: https://doi.org/10.7551/mitpress/4968.003.0009, DOI: http://dx.doi.org/10.7551/mitpress/4968.003.0009, _eprint: https://direct.mit.edu/book/chapter-pdf/2142312/9780262275064_cah.pdf.
- Edelstein, Michael (2000) "War and the American Economy in the Twentieth Century," in Stanley L. Engerman and Robert E.Editors Gallman eds. *The Cambridge Economic History of the United States*, Vol. 3 of Cambridge Economic History of the United States: Cambridge University Press, pp. 329–406, DOI: http://dx.doi.org/10.1017/ CH0L9780521553087.007.

- Farber, Henry S, Daniel Herbst, Ilyana Kuziemko, and Suresh Naidu (2021) "Unions and Inequality over the Twentieth Century: New Evidence from Survey Data," *The Quarterly Journal of Economics*, Vol. 136, pp. 1325–1385, URL: https://academic.oup.com/qje/ article/136/3/1325/6219103, DOI: http://dx.doi.org/10.1093/qje/qjab012.
- Fetter, Daniel Κ. (2016)"The Home Front: Rent Control and the Rapid Ownership," Wartime Increase The Home Journal of in Vol. 76, Economic History, 1001 - 1043,URL: https://www. pp. cambridge.org/core/journals/journal-of-economic-history/article/ home-front-rent-control-and-the-rapid-wartime-increase-in-home-ownership/ 171D34C6E02790944799DD9BB808835A, DOI: http://dx.doi.org/10.1017/ S0022050716001017, Publisher: Cambridge University Press.
- Fishback, Price and Joseph A. Cullen (2013) "Second World War Spending and Local Economic Activity in US Counties, 1939–58," *The Economic History Review*, Vol. 66.
- Fishback, Price V. and Taylor Jaworski (2016) "World War II and US Economic Performance," in *Studies in Economic History*: Springer, pp. 221-241, URL: http://www.scopus.com/inward/record.url?scp=85062461453&partnerID=8YFLogxK, DOI: http://dx.doi.org/10.1007/978-981-10-1605-9_9.
- 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*, Vol. 107, pp. 1–34, Publisher: MIT Press.
- Gordon, Robert Aaron (1974) Economic instability and growth: Harper & Row.
- Grove, Wayne A. (2000) "Cotton on the Federal Road to Economic Development: Technology and Labor Policies Following World War II," Agricultural History, Vol. 74, pp. 272–292, URL: https://www.jstor.org/stable/3744852, Publisher: Agricultural History Society.
- Haines, Michael R. (2010) "Historical, Demographic, Economic, and Social Data: The United States, 1790-2002," Technical report, Inter-university Consortium for Political and Social Research.
- Higgs, Robert (1999) "From Central planning to the Market: The American Transition, 1945–1947," *The Journal of Economic History*, Vol. 59, pp. 600–623.
- Internal\ Revenue\ Serivce, *Statstics of Income II*: Internal Revenue Serivce.
- Jaworski, Taylor (2017) "World War II and the Industrialization of the American South," The Journal of Economic History, Vol. 77, pp. 1048-1082, URL: https://www.cambridge.org/core/journals/journal-of-economic-history/ article/world-war-ii-and-the-industrialization-of-the-american-south/ B02C45F9CB7CBE9F6568EAC33F2EF0C1, DOI: http://dx.doi.org/10.1017/ S0022050717000791, Publisher: Cambridge University Press.

- Mathy, Gabriel P. (2018) "Hysteresis and persistent long-term unemployment: the American Beveridge Curve of the Great Depression and World War II," *Cliometrica*, Vol. 12, pp. 127–152, URL: https://doi.org/10.1007/s11698-016-0158-1, DOI: http://dx.doi. org/10.1007/s11698-016-0158-1.
- Nakamura, Emi and Jon Steinsson (2014) "Fiscal stimulus in a monetary union: Evidence from US regions," *The American Economic Review*, Vol. 104, pp. 753–792, Publisher: American Economic Association.
- Office\ of\ the\ Secretary\ of\ Defense (1962) "The Changing patterns of defense procurement," Technical report, Office of the Secretary of Defense.
- Ramey, Valerie A (2012) "Government spending and private activity," Technical report, National Bureau of Economic Research.
- Rhode, Paul (1994) "The Nash Thesis revisited: An Economic Historian's View," Pacific Historical Review, Vol. 63, pp. 363–392, URL: https://www.jstor.org/stable/3640971, DOI: http://dx.doi.org/10.2307/3640971, Publisher: University of California Press.
- (2003) "After the War Boom: Reconversion on the U.S. Pacific Coast, 1943-49," Technical Report w9854, National Bureau of Economic Research, Cambridge, MA.
- Rhode, Paul W, James M Snyder Jr, and Koleman Strumpf (2017) "The Arsenal of Democracy: Production and Politics During WWII," Technical report, National Bureau of Economic Research.
- 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," *The economics of World War II: Six great powers in international comparison*, p. 81, Publisher: Cambridge University Press.
- (2012) America's economic way of war: war and the US economy from the Spanish-American War to the Persian Gulf War: Cambridge University Press.
- United States Treasury Department (1938) *IRSStatstics of Income Part II*, Washington DC: U.S. GPO.
- Vanderweele, Tyler J. and Stijn Vansteelandt (2009) "Conceptual issues concerning mediation, interventions and composition," *Statistics and Its Interface*, Vol. 2, pp. 457-468, URL: http://www.intlpress.com/site/pub/pages/journals/items/ sii/content/vols/0002/0004/a007/, DOI: http://dx.doi.org/10.4310/SII.2009. v2.n4.a7.
- Vatter, Harold G (1985) The US Economy in World War II: New York: Columbia University Press.

Wilson, Mark R. (2010) ""Taking a Nickel Out of the Cash Register": Statutory Renegotiation of Military Contracts and the Politics of Profit Control in the United States during World War II," Law and History Review, Vol. 28, pp. 343-383, URL: https: //www.cambridge.org/core/journals/law-and-history-review/article/abs/ taking-a-nickel-out-of-the-cash-register-statutory-renegotiation-of-military-contract 74A6BA0258B8032C6E78AF8EBB1708A2, DOI: http://dx.doi.org/10.1017/ S0738248010000039, Publisher: Cambridge University Press.

7 Figures and Tables

	October 1945		November 1948	
	Thousands	% of 1944	Thousands	% of 1944
Total Employment (1944 Total: 41.5mil)	-3,091	-7.5%	$4,\!275$	10.3%
Total War Manufacturing	-3270	-39.4%	-2423	-29.2%
Total Non-auto Transportation	-1704	-71.1%	-1965	-82.0%
Aircraft and Shipbuilding	-1571	-75.0%	-1835	$\mathrm{f}\text{-}87.6\%$
Automobile Manufacturing	-255	-34.8%	55	7.5%
Iron and Steel	-455	-26.2%	-133	-7.7%
Electrical Machinery	-282	-36.9%	-230	-30.1%
Non-electrical Machinery	-306	-24.6%	-37	-3.0%
Total Nonwar Manufacturing	-218	-3.7%	1283	22.0%
Total Nonmanfacturing	-949	-5.2%	5243	28.6%
Mining	101	11.7%	75	8.7%
Construction	-158	-14.4%	1068	97.6%
Transport and Utilities	-63	-1.7%	268	7.1%
Trade	-541	-7.3%	2637	35.6%
Finance	-42	-3.1%	346	25.2%
Services	-246	-6.5%	849	22.4%
Civilian Government	236	3.9%	-312	-5.2%

Table 1: Change in Employment Relative to 1944

Source 1949 Statistical Supplement to Survey of Current Business



(b) Capital Income

Red dots indicate states with net out migration 1940-1947 Source: BEA panel SA5H; Census P25 1948; Haines et al 2010

Figure 1: Total Contract Spending and the Change in Income and Capital income 1940-1947



(b) Migration and Wartime Contract Spending

Red dots indicate states with net out migration 1940-1947 Source: BEA panel SA5H; Census P25 1948; Haines et al 2010

Figure 2: Migration, Total Wartime Contract Spending and Income 1940-1947



Graphs show the estimated dollar response to \$1 of war spending per capita. Dashed lines are 95% confidence intervals.

Figure 3: The Effect of WWII Contract Spending On Total Income and Private Income



Graphs show the estimated dollar response to \$1 of war spending per capita. Dashed lines are 95% confidence intervals.

Figure 4: The Effect of WWII Contract Spending On Nonfarm Ownership Income



Graphs show the estimated dollar response to \$1 of war spending per capita. Dashed lines are 95% confidence intervals.

Figure 5: The Effect of WWII Contract Spending on Corporate Income



Graphs show elasticities and dots indicate where series are significant at the 5% level.

Figure 6: Direct and Migration Effects On Total Income and Manufacturing and Nonman-ufactruing Income



Total Effect Direct Effect Migration Effec
 Total Effect Direct Effect Migration Effect

Graphs show elasticities and dots indicate where series are significant at the 5% level.

Figure 7: Direct and Migration Effects On Nonmanufacturing Sector Wages and Salaries



Graphs show elasticities and dots indicate where series are significant at the 5% level.

Figure 8: Direct and Migration Effects On Personal Ownership Income



Graphs show elasticities and dots indicate where series are significant at the 5% level.

Figure 9: Direct and Migration Effects On Corporate Profits



Graphs show elasticities and dots indicate where series are significant at the 5% level.

Figure 10: Direct and Migration Effects on Farm Income



Graphs show elasticities and dots indicate where series are significant at the 5% level.

