

A Appendix A: Outliers, Subperiods and Exogeneity

This appendix is divided into three parts. The first part establishes the rationale for treating Delaware as an outlier. The second part of this appendix establishes that estimates of our single observation per state are both comparable to the estimates of the effect of annual wartime measures of military production and also comparable to estimates for the effect of contract spending on inequality during the war and the postwar subperiods when considered separate. The final section establishes that the shock of the war can be thought of as reasonably exogenous to historical factors leading up to the war.

A.1 Outliers

Figure 1 shows the change in per capita manufacturing income and the share of state income going to the top 1% of income earners in Delaware. For comparison, gray bands represent the 0-90th percentiles for the respective values across states. As the figure shows, Delaware is somewhat of an outlier in terms of the growth of per capita manufacturing income. Only Connecticut's growth in per capita manufacturing is stronger. However, it is quite clear that Delaware is very much an outlier in terms of top income shares. Frank (2009, 2014) does not say much about Delaware individually, though for post 1945 Frank (2009) mentions Delaware as an outlier. Schmitz and Fishback (1983) dropped Delaware from their analysis of state level inequality during the Great Depression, citing both a small sample (not an issue here) and issues with the state's income statistics. In the underlying data for Schmitz and Fishback the Commerce Department (Creamer and Merwin, 1942) points out a specific issue with measuring dividend income from tax returns because of nonresidents filing Federal income tax returns in Delaware. The fact that Delaware is a clear outlier in the income share series, combined with questions about the estimates of income shares in Delaware we take as grounds for excluding Delaware from our analysis.

Dropping Delaware causes estimates for top shares (0.01% and 0.001) to be more clearly

statistically significant and brings estimates for the wartime subperiod (1940-1945) more in line with estimates for the full period. Figure 2 shows the effect of the subcategories of war spending on the share of income going to the top 1% of income earners. The black lines indicate estimates for the full population of states and the red lines indicate estimates excluding Delaware. The largest differences in estimates for subcategories are for nonequipment supply contracts and industrial contracts. Industrial contracts (plant and equipment spending) are more or less statistically insignificant with and without Delaware. When Delaware is dropped nonequipment supply contracts produce a slightly stronger response of top income shares between the two wars which filters through into the response to total war contracts.

Figure 3 shows the effect of total war contract spending on the share of income going to different top percentiles with and without Delaware. The analysis for 5% and 10% share is unchanged and is consistent with the claim in the main text that the behavior of the top 1% and smaller percentiles is distinctly different than the behavior of top 5th and 10th percentiles. In terms of the top percentile, dropping Delaware has the largest effect on the Top 0.05% and smaller percentiles. For the top three income categories, there is a small reduction in the wartime effect of total contract spending on shares and an, on average, larger postwar effect. Standard errors are somewhat tighter, as is expected, but this effect is small.

The main implication of dropping Delaware for the in the analysis in the main paper is that there is less ambiguity about the statistical significance of the results for the top 0.01% and 0.001% shares. This change affects estimates for the top 0.001% in particular.

A.2 Subperiod Analysis

There are two main potential issues with using a single per state observation of war spending to capture the effect of WWII on inequality for the full 1940-1957 period. The first centers around concerns that the single war variable is a good proxy for annual spending during the war. The second centers on issues of estimating the effect of the war for the

full 1940-1957 period when it is obvious that there are two distinct subperiods: the war period (1940-1945) and the postwar period (1946-1957). Most clearly an issue are potential Yule-Simpson effects where the aggregated period does not adequately captures estimates for either period. We demonstrate that the single contract variable is, in fact, a good proxy for annual spending. As well, the full period captures estimates of the individual subperiods reasonably well.

Figure 4 shows the response of the share of income going to the top 1% for the period 1940-1945, using various measures of war supply activity. The regression is the same as that in the main text, though the Korean War variable has been omitted. The black lines in the figure below are estimates for our single observation per state of total supply contract spending (total equipment + heavy equipment supply contracts) with three alternative measures of total war supply activity. Cumulative total annual supply contracts are preliminary, contemporary, estimates of annual total cumulative supply contract spending from the War Production Board. This panel is directly comparable to our single total supply contract spending variable for the 1940-1945, but the cumulative estimates are annual for 1942-1944. This series is rounded out from an additional estimate of state level cumulative total supply contract spending in 1945 from “State and Regional Market Indicators 1939-1945” (US Department of Commerce, 1947). War industry payrolls are also from the “State and Regional Market Indicators “1939-1945” and is total wage and salary income from war industries. War industries designated by the Department of Commerce are manufacturing industries that include petroleum, chemicals, rubber, steel and iron, nonferrous metals, machinery, electrical equipment, automobiles, and other transportation equipment. The “constructed series” is attempt to blend the two series to approximate total contract spending for each year as opposed to cumulative spending for the years 1942-1945. War industry payrolls are used to estimate contract spending for the years 1940 to 1941 and to resolve some issues with the cumulative supply contract spending estimates for the individual years.

As you can see form Figure 4 the single observation per state can be thought of as a

reasonable proxy for annual war spending. It is obvious from the figure that payroll and annual contract data suggest a smaller effect than the cumulative total variable. However, both annual series are likely to underestimate wartime supply spending. The annual cumulative supply contract data is likely to be less well measured relative to the total supply contract variable because the annual estimates are contemporary and preliminary. For instance in some states, cumulative contract spending declines between yearly estimates. This is obviously impossible. The payroll measure of wartime activity is also likely to understate the effect of contract spending for two reasons. First, war industries did not produce solely for the military. Certainly a large portion of output from these industries went to the war effort, but the broader measure of economic activity in “war industries” is going to less exactly capture economic activity generated by war contracts than a direct measure of contracts themselves. The second reason we would expect a reduced effect, even if war industries captured contract spending perfectly, is that payrolls are only a portion of war contracts. What is missing, of course, is ownership income. Where there is overlap, there is a fair amount of difference in the evolution of payrolls and contracts. The constructed series suffers from the weaknesses of both individual series, but is included because it reinforces the stability of the estimates across measures of war spending.

Figure 6 shows estimates of the effect of total war contracts and total supply contracts on both the full period and the wartime (1940-1945) and postwar (1946-1957) periods. The figures show estimates for all states and also estimates when Delaware is dropped. Additionally the figures include the effect of war spending on the share of income going to the top 1% when Delaware, Washington DC and Florida are excluded. Figure 6 offers the main reason why Delaware has been excluded from this study. Dropping Delaware brings the wartime estimates of the effect of contract spending on the share of the top 1% more in line with our full period estimates. We feel that demonstrating that the full period captures the responses for the two subperiods individually is crucial to establishing the credibility of our estimates. As such, dropping Delaware brings our wartime subperiod estimates and our full

period estimates more into line. The final panel also shows the effect on subperiod estimates of dropping DC and Florida as well as Delaware. This goes even further to bring our full period and wartime estimates in line with each other, especially for total supply contracts (not shown). However, while DC and Florida are somewhat outliers in terms of manufacturing growth, particularly during the war, we feel there are no real grounds for treating these states as outliers. They are included in this discussion to establish that the difference in estimates between the full period and the wartime subperiod is being driven by specific states and there is no indication of a systematic Yule-Simpson effect when disaggregating the full period.

It should also be noted that the full period consistently overestimates the effect of the postwar period relative to subperiod estimates and dropping individual states has no real effect on this. This overestimation is not large, less than 0.1 percentage point on average when Delaware is dropped.

A.3 Historical Endogeneity

Figure 6 shows the results for a simple test of historical engogeneity. We have regressed total war contract spending “backwards” on top income shares from 1929-1940 using the same regression specification use above, without the Korean War variable. The year 1940 is omitted as with the main regression so that these estimates can be interpreted as relative to 1940. There are likely two sources of potential bias. The first source is related to the idea that “WWII ended the Great Depression.” The problem this poses for our analysis is that any correlation between the Depression and the war may result in attributing a decline in inequality to the war that was actually caused by the Depression. As Figure 6 shows, there is a strong correlation between war spending and the recession phase of the great depression (1929-1933) for all income shares. However, one would expect the shock of the Depression to be correlated with the shock of the war. Both historical events were massive shocks to manufacturing in the United States. As the figure also makes clear, the Depression

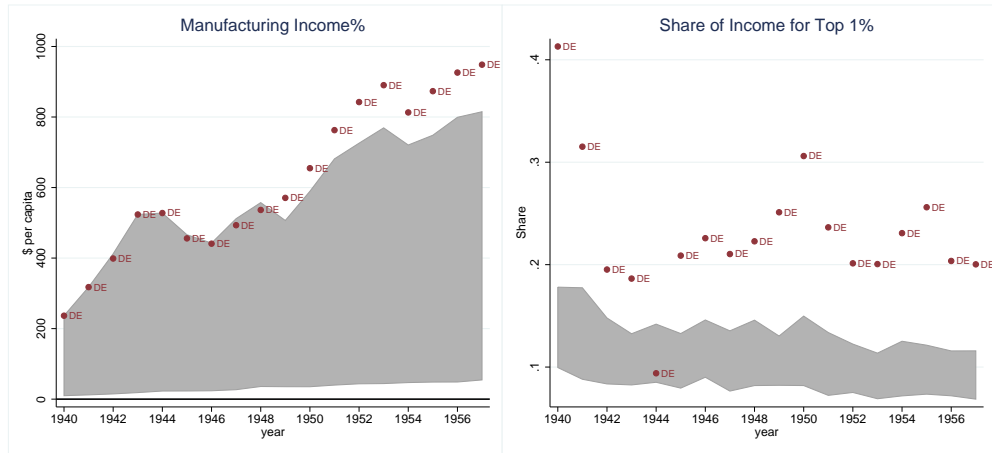
brought with it an compression in income. This Depression compression, however is clearly due to different historical factors and can be thought of as “bad compression” because it accompanied by a collapse in income. The compression associated with WWII can be thought of as “good compression”, since it was the produce of generalized prosperity. More to the point of this section, while correlation between two larges shocks to manufacturing within a 20 year period is to be expected, the fact that this correlation is temporally distinct means that we are not concerned that Depression bias is distorting our results.

Another historical force to take into consideration is the fact that there was a long period of increasing global instability and a gradual, though stunted, military buildup. The increase in demand for munitions, both foreign and domestic and the gold inflows from Europe (Romer, 1992) may have also played a role in changing top income shares in the lead up to the war. it is quite clear this is an issue for the top 5% and top 10% income shares. However, as stated above, we consider these income shares as distinctly different than top 1% and smaller quantiles. In fact we take the clear correlation between war spending and the top 5% and 10% income shares after 1934 as further evidence that we cannot say anything about income shares below the top 1%. For the top income shares there is some hint towards possible bias from the second half of the 1930s, in particular in 1937. However, for all ownership and control shares this bias resolves itself into a tightly estimates zero after 1937. It should be pointed out, though, that even though the estimate is essentially zero correlation for the top 0.001% it is plausible the share of income going to that particular quantile was on a down trajectory before the war. However, as with the top shares the bias is positive, suggestion that the correlation during the build up to the war is biasing the post 1940 estimates towards zero.

References

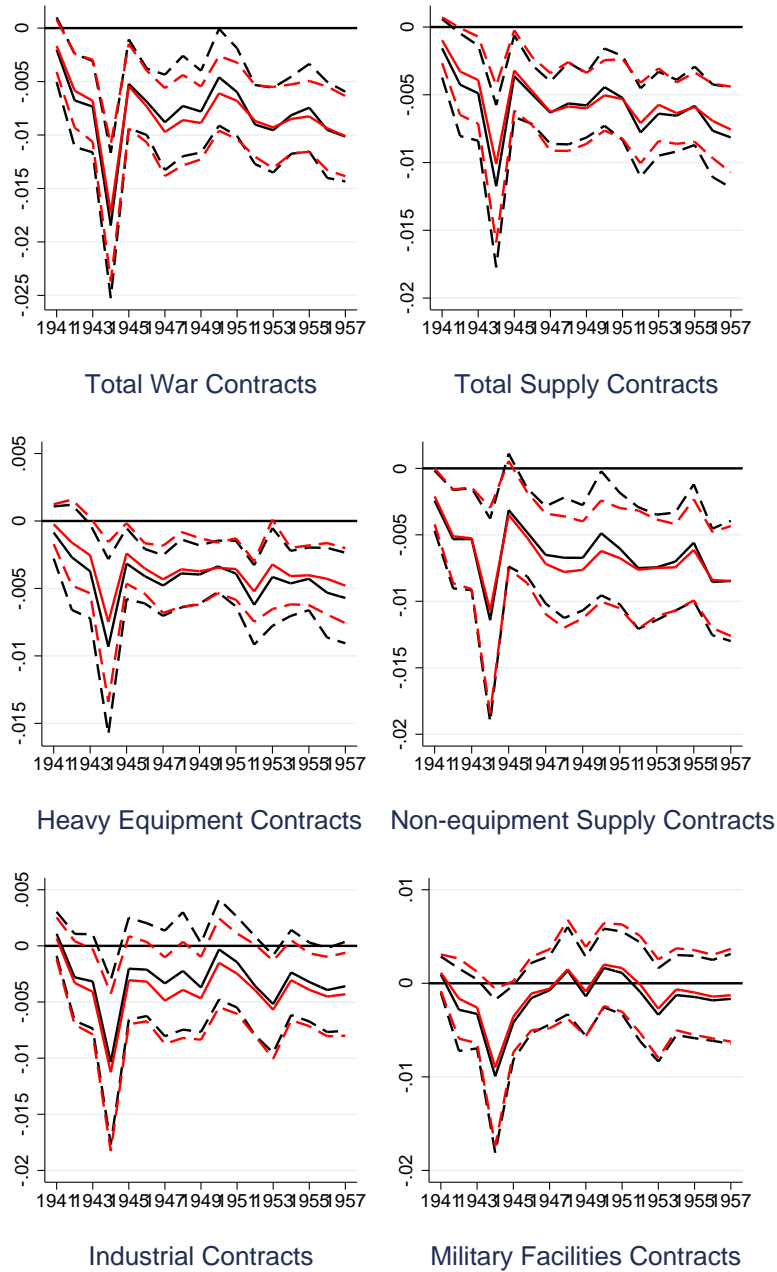
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A.4 Figures



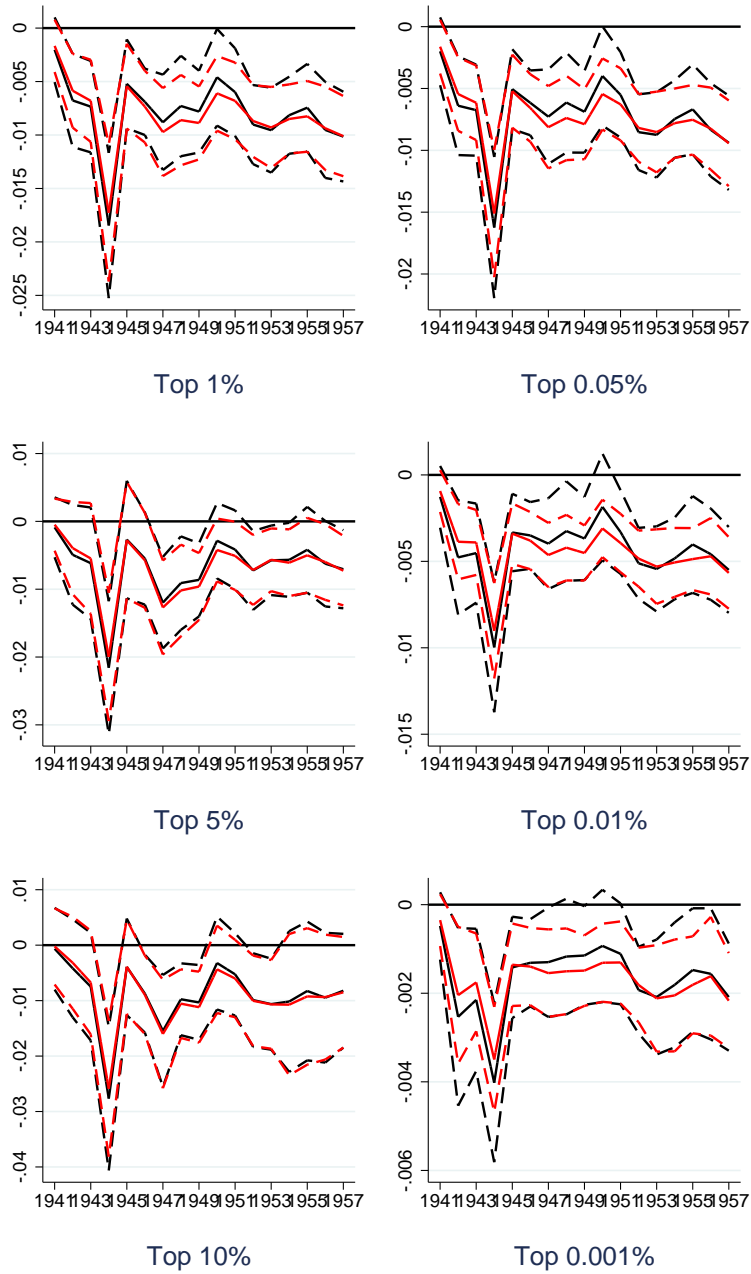
Gray area covers 0-90th percentile

Figure 1: The Evolution of Manufacturing and the Share of the Top 1% by State



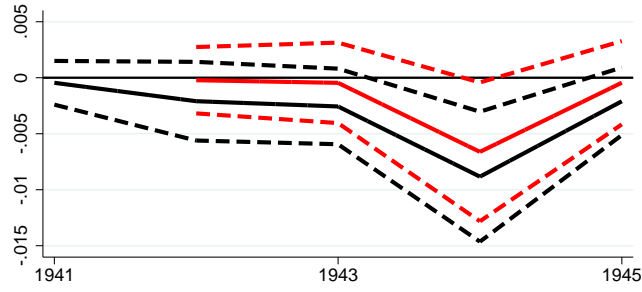
Black lines indicate full population. Red lines exclude Delaware.
 Dashed lines are 95% confidence intervals.

Figure 2: Response of Top 1% Income Shares to War Contract Spending with and without Delaware

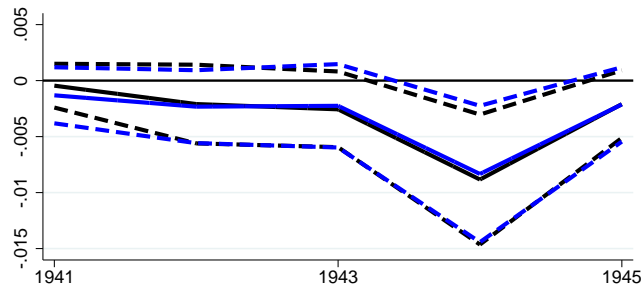


Black lines indicate full population. Red lines exclude Delaware.
Dashed lines are 95% confidence intervals.

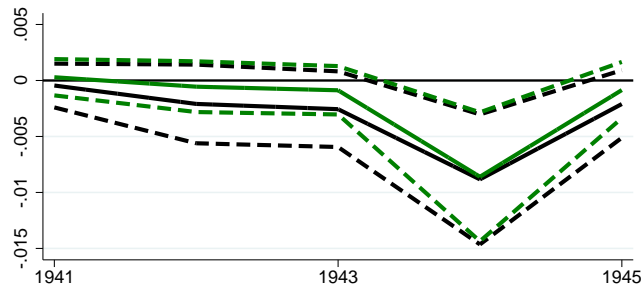
Figure 3: Response of Income Shares to Total Contract Spending With and Without Delaware Included



Annual Cummulative Total War Supply Contracts



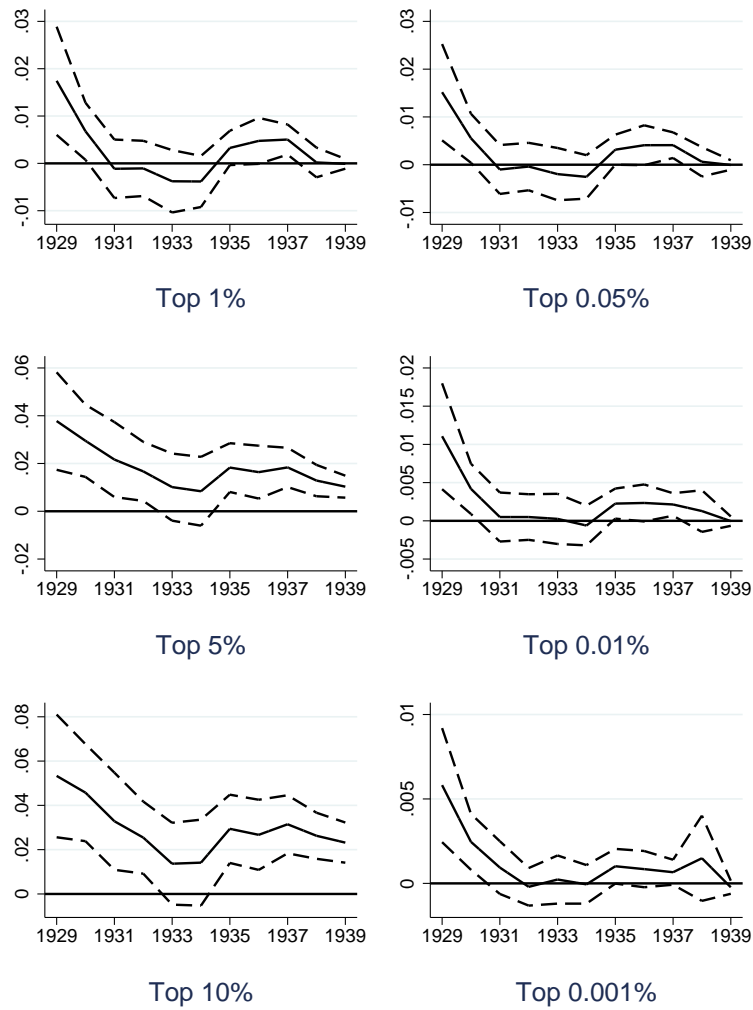
War Industry Wages and Salaries



Constructed Series

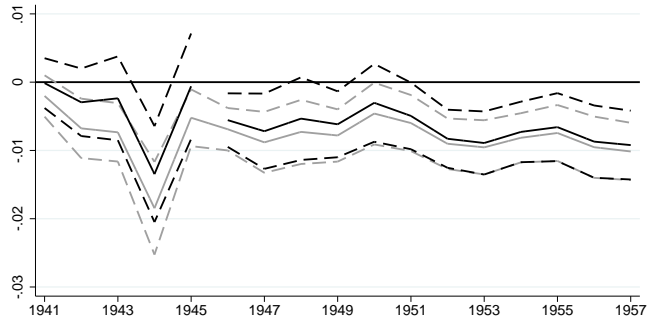
Colored lines are annual series, black lines are for the single observation of total supply contract spending. Dashed lines are 95% confidence intervals.

Figure 4: Comparison of Annual Wartime Spending with Total Supply Contract Spending Effect on Top 1% Income Share

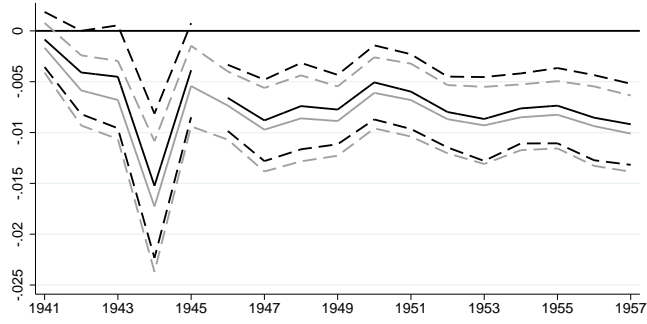


Dashed lines are 95% confidence intervals.

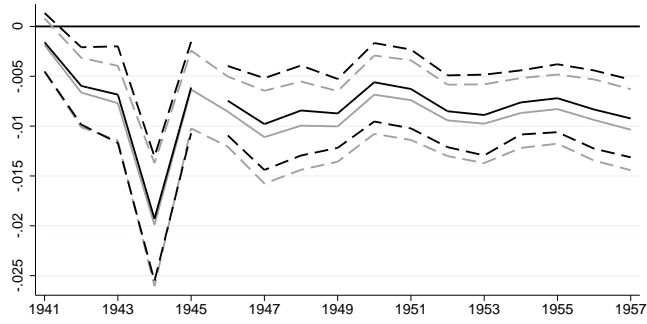
Figure 5: Endogeneity Test of Top Income Shares 1929-1940 and Total WWII Contract Spending



All States



DE Dropped



DE, DC, and FL Dropped

Dashed lines are 95% confidence intervals.

Figure 6: Total War Contract Spending Effect on Top 1% Various States Dropped