

The Rise and Fall of Female Labor Force Participation During World War II in the United States

Online Appendix

January 30, 2018

Female wartime employment

I digitized data on total, female, and nonwhite reported employment, as well as number of reporting establishments, by metro area from ES-270 summaries from July, September and November 1943, June, July and September 1944, and January and March 1945. Some metro areas reported lie in multiple states. In these cases, I assign the recorded employment counts to both states for analyses at that level of aggregation. Results are robust to dropping these areas, which account for less than a third of reported employment. I also recorded reported aggregate total and female employment by industry. I use the data from July 1944, when aggregate female employment was roughly at its peak, but have also considered the average employment in all data collected.

I collected data from USES reports on total, female, veteran and World War II veteran placements by state for 37 months between 1942 and early 1946. Not all months from 1942-1946 are included due to gaps in the reported information and changes in reports' layout. There is continuous data on total and female placements by state for 1943 and the second half of 1944 through 1946. Aggregate female and total placements are available continuously. The precise set of variables recorded varies over time. Beginning in 1944, the data contain information on total new job applications by state. In 1946, new female job applications are reported. In addition to the state-level data, I collected information on placements for men

and women in 37 detailed industry categories from November 1944 to April 1946. In analyses using state-level information on total female placements, I sum total placements over 1943 and the second half of 1944 through 1945, omitting the first half of 1944 because the data is missing. Results are robust to several variations, including dropping 1943 data.

Manpower mobilization

Inductions data come primarily from the National Archive’s online database of Army Enlistment Records. The full database includes records for 9,200,232 total observations. From these, I identified 8,361,427 records with valid state and county of residence fields after dropping Alaska and Hawaii, records with corrupt or missing data. For a small subset of records with missing state of residence data, I replaced the field using the state of enlistment. I then summed total enlistment counts by SEA and state and divided by the 1940 male population aged 21-54 to form the primary measure of induction intensity.

Casualty data primarily come from the Army and Army Air Forces “Honor Roles of Dead and Missing.” These documents list the total Army and Army Air Force deaths in the line of duty for each state and county and cover the period May 27, 1941 through January 31, 1946. These figures include those killed in action, deaths from wounds or injuries, non-battle deaths, missing men, and all others determined dead by law. For each death, the War Department also reported a location. This location corresponds to either the soldier’s home upon induction or, if he gave no address when inducted, the address of his next-of-kin. If neither of these addresses were available, the reports list the location of the soldier’s draft board. Failing that, soldiers are listed as “State at Large.”¹ I digitized these records to obtain county-level sums.

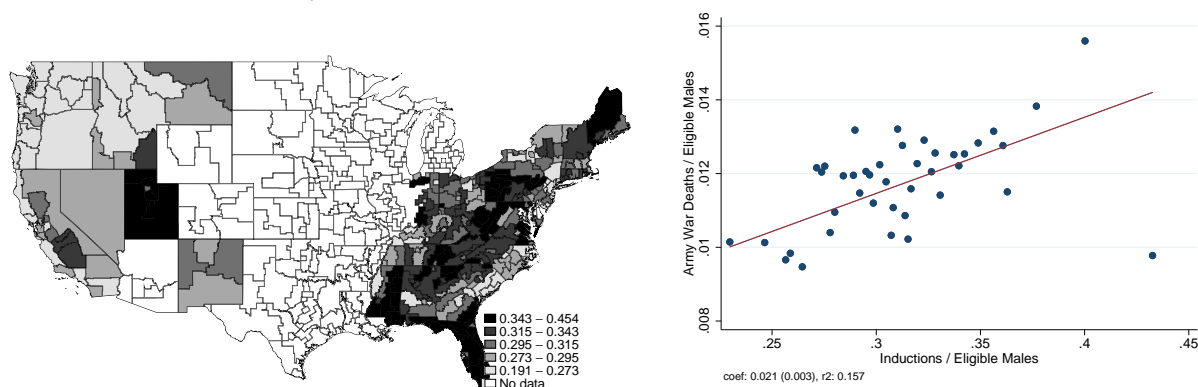
I then added total deaths from lists of War Casualties for the Navy, Marine Corps, and Coast Guard, which comprised roughly (25%) of the total fighting force. These records

¹A negligible number of soldiers fall into this category.

list individuals killed in the service and their home address. Addresses were digitized and geocoded, yielding a roughly 93% match rate. After throwing out corrupted and missing entries, the combined induction and casualty data record information for 3,064 counties. This includes the distribution of 368,592 deaths.

Casualties are a strong predictor of inductions in areas where the induction data is high quality, as shown in Figure 1 Panel B. The figure is a binned scatter plot of inductions (i.e., mobilization rates) against war deaths as a fraction of military aged males for commuting zones in all states where at least 80% of known induction totals are captured.

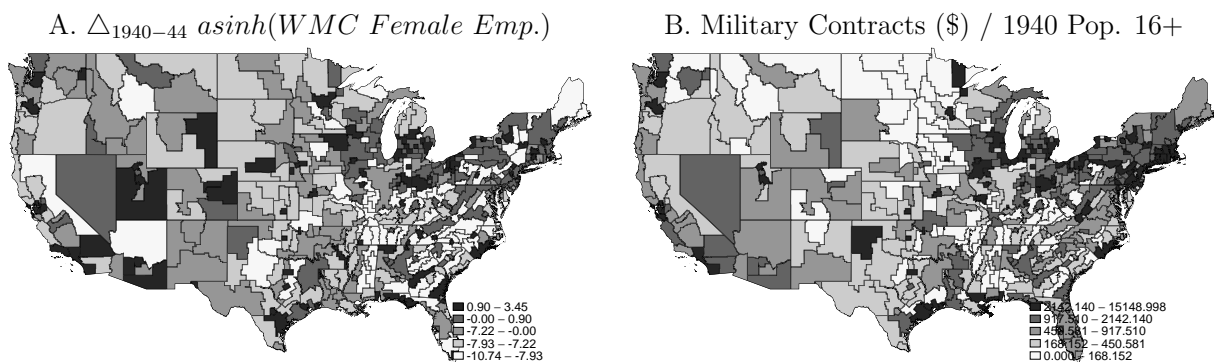
Figure 1: Induction Data Availability and Relationship with War Deaths
A. Inductions / Eligible Males B. War Deaths vs. Inductions



Notes: The outcome mapped in Panel A is total inductions measured in the National Archives dataset divided by the 1940 male population aged 21-54. Only areas where the data provides at least 80% coverage of the known totals are mapped. Panel B plots total war deaths divided by the 1940 male population aged 21-54 against induction rates in the same areas. The regression line is weighted by total 1940 population.

Supplemental Figures and Tables

Figure 2: War Contracts, Manpower Mobilization, and Female Employment



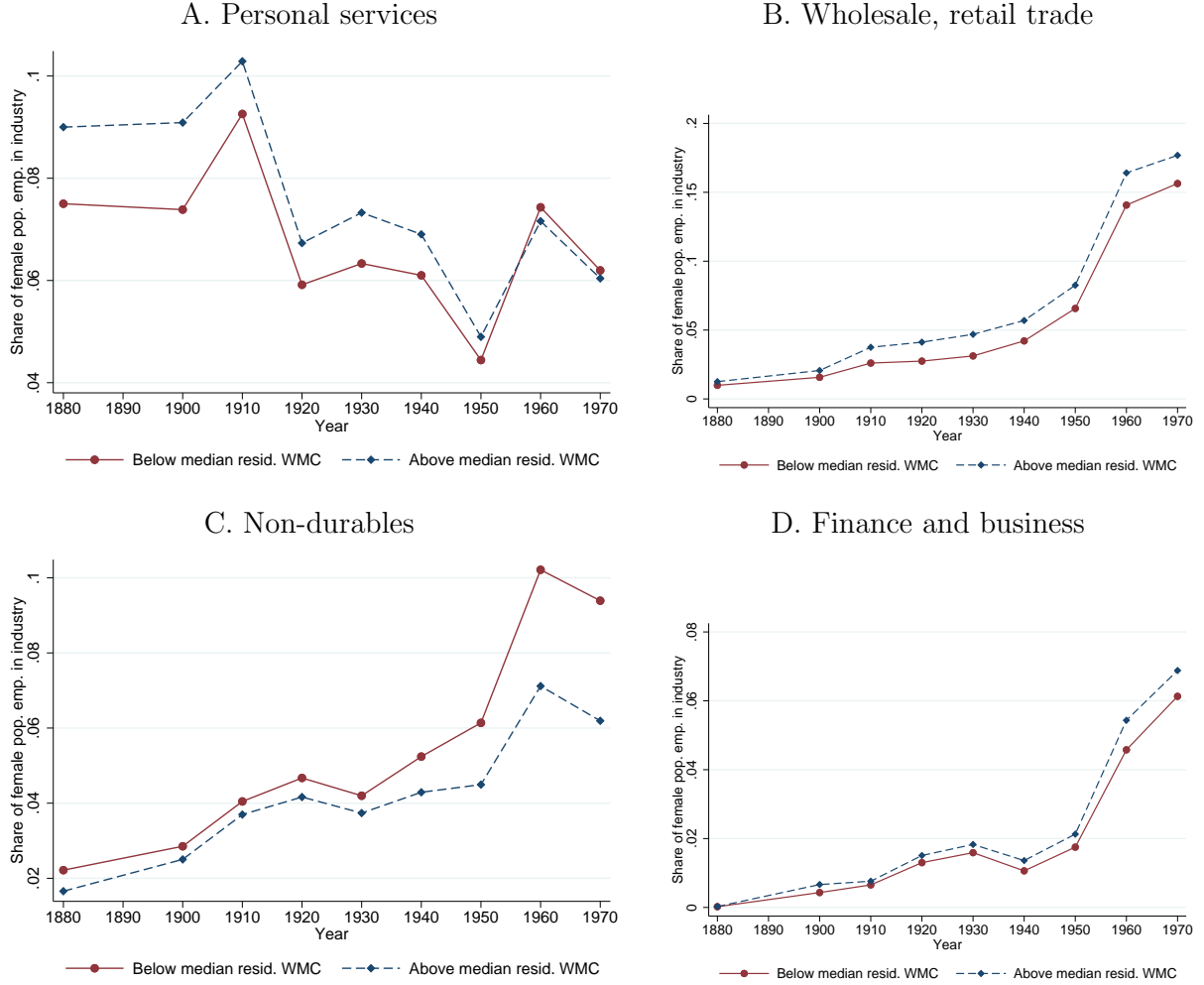
Notes: Panel A maps the change in the inverse hyperbolic since of WMC female employment from 1940 (measured as IPUMS 1950 industry codes 200-599 and 900-946) to July 1944. Asinh provides an approximate to natural logs when some values are zeros. Panel B maps total war contracts spending from 1940-1945 divided by the 1940 population aged 16 or older.

Figure 3: Weeks Worked in 1940 and Mobilization



Notes: Sample is the same as in Table ?? but restricted to women with positive weeks worked and in the year 1940 only. See the notes to Table ?? for additional details on sample.

Figure 4: Pre-trends in Additional Industry Categories



Notes: Figures plot the share of women employed in various industries for SEAs with above and below median WMC employment intensities residualized on the 1940 controls included in all regressions. Results should be interpreted with caution because definitions of and the universe asked about labor force participation and industry changed across years. Until 1930 participation was defined as reporting any gainful occupation. In 1940 and after, participation meant having, seeking, or being temporarily absent from work. From 1880-1920 all those reporting gainful occupation were asked about their industry. In 1930, all individuals were asked. For 1940-1950, only those in the labor force were asked. And in 1960, those who had worked in the previous 10 years but not persons with a job but not at work last week or new workers were asked..

Table 1: **Summary of WMC and USES Data by State (1)**

state	WMC Employment July 1944 (multistates double counted)				Total USES Placements			
	Total ('000)	Female ('000)	% female	Female / 1940 fem. pop	Total ('000)	Female ('000)	% female	Female / 1940 fem. pop
AL	227.4	65.81	0.289	0.0693	528.6	152.6	0.289	0.161
AR	42.87	20.92	0.488	0.0320	315.5	78.45	0.249	0.120
AZ	19.84	7.332	0.370	0.0456	151.9	44.64	0.294	0.277
CA	1005	308.6	0.307	0.116	2639	807.5	0.306	0.302
CO	61.25	21.11	0.345	0.0523	252.5	60.05	0.238	0.149
CT	381.7	140.1	0.367	0.209	312.0	112.4	0.360	0.168
DE	50.02	14.42	0.288	0.145	59.92	20.79	0.347	0.208
FL	129.6	36.70	0.283	0.0521	503.1	173.5	0.345	0.246
GA	225.7	86.58	0.384	0.0797	611.3	210.6	0.344	0.194
IA	147.1	47.18	0.321	0.0506	322.6	118.8	0.368	0.127
ID	6.667	2.255	0.338	0.0132	95.75	20.24	0.211	0.118
IL	1263	417.3	0.330	0.137	1166	316.4	0.271	0.104
IN	670.4	198.4	0.296	0.156	745.8	268.8	0.360	0.211
KS	174.8	66.08	0.378	0.0997	332.0	96.21	0.290	0.145
KY	298.8	98.43	0.329	0.103	419.1	106.5	0.254	0.111
LA	126.4	30.73	0.243	0.0374	246.9	58.77	0.238	0.0716
MA	697.7	267.3	0.383	0.155	666.9	284.5	0.427	0.165
MD	362.2	104.3	0.288	0.154	395.4	160.9	0.407	0.237
ME	91.00	24.93	0.274	0.0818	157.7	51.39	0.326	0.169
MI	1099	327.6	0.298	0.174	881.5	247.5	0.281	0.132
MN	131.6	39.89	0.303	0.0397	480.4	135.3	0.282	0.135
MO	339.1	115.3	0.340	0.0800	689.2	209.2	0.303	0.145
MS	11.30	3.930	0.348	0.00542	280.4	94.87	0.338	0.131
MT	4.328	1.017	0.235	0.00545	78.39	11.43	0.146	0.0613
NC	138.1	59.52	0.431	0.0501	544.5	197.0	0.362	0.166
NE	53.61	21.18	0.395	0.0444	175.0	42.50	0.243	0.0891
NH	63.13	20.86	0.331	0.112	65.82	29.01	0.441	0.156
NJ	1283	418.6	0.326	0.257	854.3	329.8	0.386	0.202
NM	3.055	1.296	0.424	0.00785	85.12	14.89	0.175	0.0902
NV	7.681	2.230	0.290	0.0618	94.75	19.48	0.206	0.539
NY	1166	384.6	0.330	0.0723	2779	1113	0.401	0.209
OH	1075	336.4	0.313	0.129	1634	552.6	0.338	0.212
OK	86.79	33.18	0.382	0.0415	311.6	72.16	0.232	0.0903
PA	1448	387.1	0.267	0.105	1381	452.2	0.328	0.123
RI	130.2	55.88	0.429	0.198	166.9	70.35	0.422	0.250
SC	108.0	38.72	0.358	0.0622	298.9	112.5	0.376	0.181
SD	5.304	2.158	0.407	0.00992	46.33	13.65	0.295	0.0627
TN	190.1	68.72	0.361	0.0675	519.5	155.7	0.300	0.153
TX	358.3	95.00	0.265	0.0422	1466	369.1	0.252	0.164
UT	44.27	16.60	0.375	0.0909	195.5	52.62	0.269	0.288
VA	196.0	62.12	0.317	0.0672	478.1	171.0	0.358	0.185
WA	333.3	97.25	0.292	0.152	779.5	213.7	0.274	0.334
WI	362.5	106.8	0.295	0.0946	544.7	202.7	0.372	0.179
WV	156.9	31.34	0.200	0.0504	260.9	64.96	0.249	0.104
WY	3.437	1.646	0.479	0.0203	52.11	8.714	0.167	0.107
DC	50.97	12.73	0.250	0.0450	135.1	70.82	0.524	0.250
ND	0	0	0	0	46.29	13.34	0.288	0
OR	139.0	39.44	0.284	0.0970	482.5	139.6	0.289	0.343
VT	13.20	3.391	0.257	0.0263	32.60	11.48	0.352	0.0891

Notes: Table displays raw state-level measures of total employment / placements, female employment / placements, female shares, and female employment / placements normalized by each state's 1940 female population 16+ years old. The left-hand side of the table uses WMC data for July 1944 with geographies that lie in multiple states are assigned to both states (double counted). The right-hand side uses USES placement data for 1943 and the second half of 1944 through 1945, which represents all data available from Pearl Harbor to VJ day.

Table 2: **Summary of WMC and USES Data by State (2)**

state	WMC Employment July 1944 (multistates dropped)				USES Placements 1944q3			
	Total ('000)	Female ('000)	% female	Female / 1940 fem. pop	Total ('000)	Female ('000)	% female	Female / 1940 fem. pop
AL	191.5	49.68	0.259	0.0523	73.82	22.61	0.306	0.0238
AR	27.34	14.99	0.548	0.0229	35.23	9.158	0.260	0.0140
AZ	19.84	7.332	0.370	0.0456	17.68	5.980	0.338	0.0372
CA	954.0	295.9	0.310	0.111	362.4	109.6	0.303	0.0410
CO	61.25	21.11	0.345	0.0523	30.68	7.500	0.244	0.0186
CT	381.7	140.1	0.367	0.209	39.62	14.33	0.362	0.0214
DE	50.02	14.42	0.288	0.145	7.128	3.032	0.425	0.0304
FL	129.6	36.70	0.283	0.0521	58.48	20.88	0.357	0.0296
GA	147.0	53.77	0.366	0.0495	98.94	38.49	0.389	0.0354
IA	55.04	17.90	0.325	0.0192	54.07	22.37	0.414	0.0240
ID	6.667	2.255	0.338	0.0132	12.04	3.366	0.280	0.0196
IL	811.5	295.0	0.364	0.0968	212	40.03	0.189	0.0131
IN	291.7	101.1	0.347	0.0795	98.85	31.88	0.322	0.0250
KS	60.99	23.54	0.386	0.0355	39.01	12.89	0.330	0.0194
KY	8.031	2.968	0.370	0.00309	58.07	17.45	0.301	0.0182
LA	126.4	30.73	0.243	0.0374	34.79	7.269	0.209	0.00885
MA	582.0	215.5	0.370	0.125	84.32	35.81	0.425	0.0207
MD	230.0	69.24	0.301	0.102	72.13	32.55	0.451	0.0479
ME	67.11	19.46	0.290	0.0639	18.74	6.230	0.333	0.0204
MI	965.9	285.7	0.296	0.152	110.1	28.10	0.255	0.0150
MN	108.7	36.73	0.338	0.0366	63.60	22.45	0.353	0.0224
MO	9.121	3.587	0.393	0.00249	89.33	24.23	0.271	0.0168
MS	11.30	3.930	0.348	0.00542	39.70	14.52	0.366	0.0200
MT	4.328	1.017	0.235	0.00545	10.85	1.629	0.150	0.00873
NC	138.1	59.52	0.431	0.0501	83.64	31.68	0.379	0.0267
NE	11.82	5.690	0.481	0.0119	21.60	6.054	0.280	0.0127
NH	26.04	12.01	0.461	0.0644	7.640	3.801	0.498	0.0204
NJ	689.9	245.8	0.356	0.151	112.3	44.55	0.397	0.0273
NM	3.055	1.296	0.424	0.00785	10.45	1.818	0.174	0.0110
NV	7.681	2.230	0.290	0.0618	8.386	2.083	0.248	0.0577
NY	1133	372.2	0.328	0.0700	312.7	121.5	0.389	0.0229
OH	725.9	234.1	0.322	0.0897	220.9	75.22	0.341	0.0288
OK	86.79	33.18	0.382	0.0415	47.54	10.30	0.217	0.0129
PA	683.1	165.3	0.242	0.0448	192.1	62.51	0.325	0.0170
RI	14.54	4.005	0.276	0.0142	22.32	12.12	0.543	0.0430
SC	96.27	34.12	0.354	0.0549	52.85	18.95	0.359	0.0305
SD	5.304	2.158	0.407	0.00992	5.253	2.058	0.392	0.00946
TN	127.1	43.57	0.343	0.0428	82.68	22.30	0.270	0.0219
TX	342.8	89.07	0.260	0.0396	199.0	41.88	0.210	0.0186
UT	44.27	16.60	0.375	0.0909	24.11	8.666	0.359	0.0475
VA	164.0	49.05	0.299	0.0530	86.28	31.62	0.367	0.0342
WA	194.3	57.81	0.298	0.0904	100.2	27.52	0.275	0.0430
WI	322.2	98.17	0.305	0.0869	68.05	24.56	0.361	0.0217
WV	60.28	7.038	0.117	0.0113	42.35	8.506	0.201	0.0137
WY	3.437	1.646	0.479	0.0203	6.178	1.151	0.186	0.0142
DC	.	.	.	.	29.28	16.36	0.559	0.0578
ND	.	.	.	.	4.846	1.281	0.264	0
OR	.	.	.	.	56.75	16.28	0.287	0.0400
VT	.	.	.	.	4.738	1.645	0.347	0.0128

Notes: Table displays raw state-level measures of total employment / placements, female employment / placements, female shares, and female employment / placements normalized by each state's 1940 female population 16+ years old. The left-hand side of the table uses WMC data for July 1944 with geographies that lie in multiple states are dropped entirely. The right-hand side uses USES placement data for the third quarter of 1944, which was a peak in female wartime employment.

Table 3: Detailed Industry Placement Declines

Industry	1945 Jan-Mar to Sep-Nov change		1945 Jan-Mar total
	Share female	Total placements	
Total	-0.00401	-0.428	883300
Aircraft and parts	-0.132	-0.940	55712
Apparel and related products	0.0571	-0.285	48051
Automobiles and automobile equipment	-0.0822	-0.482	6080
Chemicals	-0.102	-0.656	25853
Contract construction	-0.0226	-0.356	6942
Electrical machinery	-0.101	-0.680	54804
Establishments, n.e.c.	-0.0951	-0.774	1979
Finance, insurance and real estate	0.00908	-0.178	9033
Food and kindred products	-0.0592	0.754	49685
Forestry and fishing	-0.0286	1.018	99
Furniture and finished lumber products	-0.0372	-0.472	11138
Interstate railroads	-0.0216	-0.607	4581
Iron and steel and their products	-0.0689	-0.569	33066
Leather and leather products	0.0797	-0.240	11589
Lumber and timber basic products	-0.0399	-0.517	3951
Metal working machinery	-0.0335	-0.724	7355
Mining	-0.00567	-0.576	1219
Miscellaneous manufacturing	-0.0237	-0.325	18169
Nonferrous metals and their products	-0.00944	-0.643	11250
Ordnance and accessories	-0.190	-0.947	69583
Other machinery	-0.0860	-0.564	21633
Other public utilities	-0.0385	-0.565	24317
Other transportation equipment	-0.0918	-0.369	463
Paper and allied products	-0.0555	-0.403	12909
Printing, publishing and allied industries	0.0423	-0.179	5244
Private households	-0.0277	0.444	73496
Products of petroleum and coal	-0.0274	-0.682	2536
Railroad equipment	-0.0801	-0.644	1275
Regular government establishments	-0.0527	-0.550	62936
Rubber products	-0.172	-0.561	12640
Service industries except private households	0.0186	-0.189	63849
Ship and boat building and repairing	-0.0502	-0.832	17086
Special government projects	-0.0213	-0.765	755
Stone, clay and glass products	-0.0921	-0.346	10288
Textile-mill products	-0.0131	-0.598	46468
Tobacco manufactures	-0.0122	-0.764	6813
Wholesale and retail trade	0.00280	-0.136	90453

Notes: Table displays the data underlying Figure 6 Panel C. See the notes to that table for additional details.