

# Historical Differences in Female-Owned Manufacturing Establishments: The United States, 1850–1880

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We characterize female-owned manufacturing establishments using newly digitized manuscripts from the US Census of Manufactures (1850, 1860, 1870, 1880). Female-owned establishments were smaller than male-owned establishments and had lower capital-to-output ratios, which could reflect more-constrained financial access and other distortions. Female-owned establishments employed more women and paid women higher wages, potentially creating a virtuous cycle between increased female business ownership and increased female labor market participation. Female-owned establishments concentrated in sub-industries like women’s clothing and millinery, which is associated with some but not all of these differences. We also show how female owners differed from other women in the Population Census.

The 19th century United States experienced substantial industrial growth and technological advancement, which altered women’s roles in the economy. Views into women’s business ownership have been limited by data availability, however, in contrast to a larger literature on women’s labor market participation (e.g., Goldin and Sokoloff, 1982). Using newly digitized records from the Census of Manufactures, we identify female-owned establishments based on owner name and links to the Census of Population.

Female-owned manufacturing establishments represent only 1% of all establishments in our data, but these 4,105 establishments still provide a view into the distinctive features of female-owned manufacturing. These historical differences complement a modern literature that explores differences between female-owned and male-owned businesses, particularly in modern developing countries (e.g., Ashraf, Delfino and Glaeser, 2022; Asiedu et al., 2023).

## I. Establishment-level Data

We use the decennial Census of Manufactures (CMF) from 1850 to 1880 (see Hornbeck et al. 2024 for a description of the data coverage). Enumerators recorded establishments’ name, county, industry, output value, capital value, materials costs, labor costs, and number of female and male workers. In 1850 and 1860, establishments reported female wages, and in 1870 and 1880 they reported the number of child workers. We group establishments into 29 general industries and 313 detailed industries.

We classify 4,105 establishments as female-owned using the recorded “Name of Corporation, Company, or Individual Producing Articles.” We manually designate these female-owned establishments, following Gozen (2024), excluding company names. When the CMF records a unisex name or a first initial only, we assign these as male-owned establishments. This process potentially understates total female-owned establishments, but provides a cleaner comparison between (likely) female-owned establishments and (likely) male-owned establishments. When there are multiple owners, we classify the establishment as female-owned if any owner is female (2% of female-owned establishments).

We attempt to hand-link 3,837 distinct

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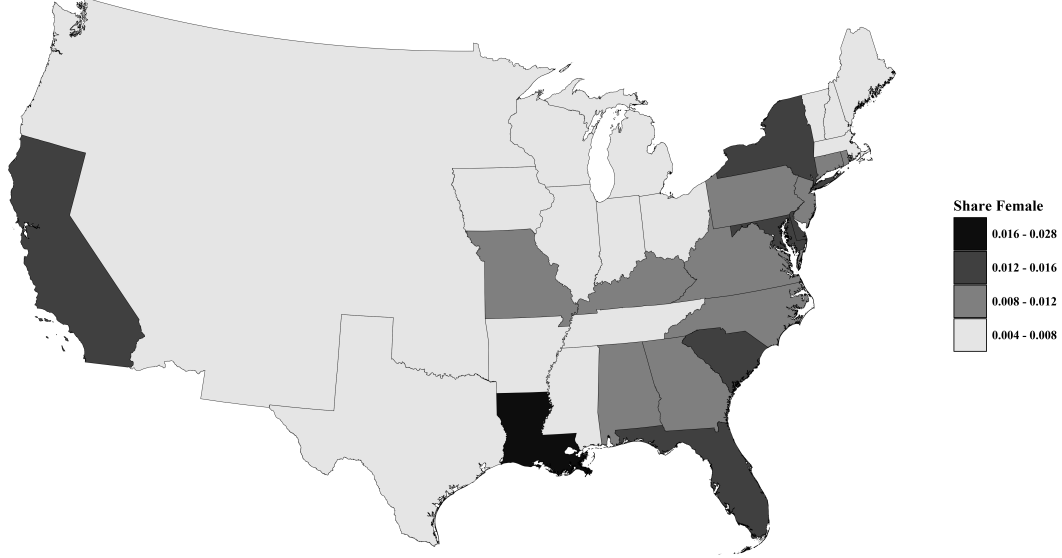


FIGURE 1. FEMALE OWNERSHIP SHARES ACROSS STATES, 1850-1880

*Note:* These data are pooled across available decades for each state: GA, LA (1880 only); MD (not in 1870); all other mapped states (1850-1880); and the combined rest of the West (MN, OR Terr. in 1850; KS, NE, UT, WA Terr. and MN, OR in 1860; CO, ID, MT, UT, WA Terr. and KS, MN, NE, NV, OR in 1870; ID, Dakota, MT, UT, WA, WY Terr. and CO, KS, MN, NE, NV, OR in 1880).

female owners of these establishments to the Census of Population, using: name, county, industry/occupation, and Census age. We link 1,700 to the Census of Population, and 74% of these linked owners are female.<sup>1</sup> For 1,247 distinct female owners, the Census of Population also provides a demographic comparison to other women in the Census.

## II. Variation by State and Industry

Figure 1 shows geographic variation in the share of manufacturing establishments owned by women. Female-owned establishments were less than 2.6% of establishments in all states, though were more common along the East and Gulf Coasts and in California. In the South, the higher share of female-owned establishments accompanies a lower total number of establishments.

Figure 2, panel A, shows the 10 general industries with the highest share of female-

owned establishments. Female-owned establishments are 8% of all clothing establishments, and no more than 2.3% in the others. In the 19th century, gender roles and social norms strongly influenced women's primary involvement in household production of clothing and food. That these sectors were particular areas of focus for women's market-focused manufacturing activity is also reflected in women inventors' focus on technologies related to household appliances and apparel (Gozen, 2024).

Figure 2, panel B, shows the 10 detailed industries with the highest share of female-owned establishments. Female-owned establishments were 25-40% of establishments in millinery (women's hats) and women's and children's clothing, and around 10% in hair-work and artificial flowers & feathers. This concentration could reflect greater relative experience, as well as trust and connections with other women in these industries (Ashraf, Delfino and Glaeser, 2022; Asiedu et al., 2023).

<sup>1</sup>The estimated differences for female-owned establishments could be divided by 0.74, to adjust for misgendered establishments in the CMF, though linkage errors to the Census of Population would understate the female share.

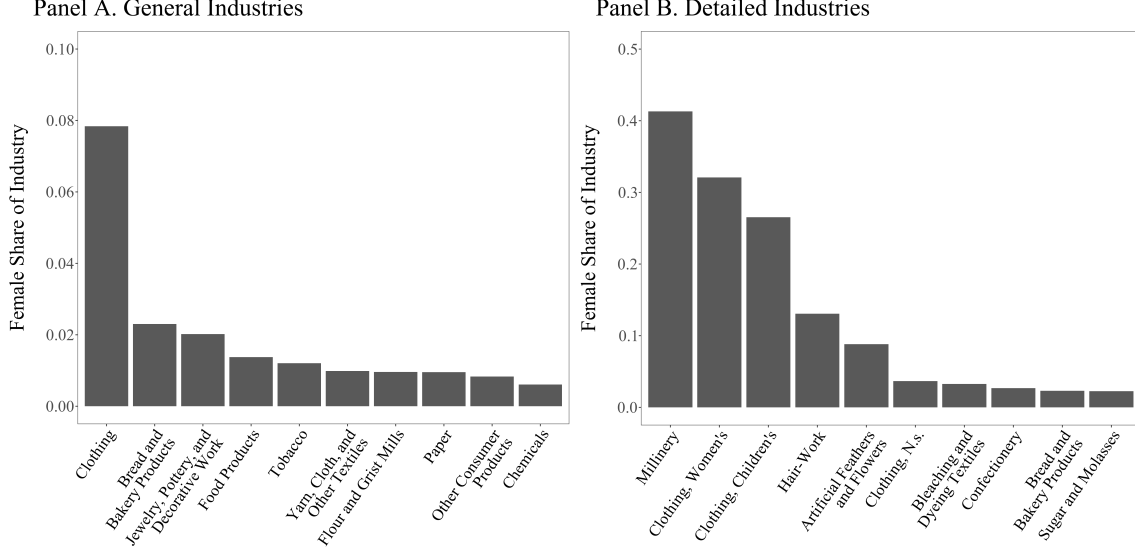


FIGURE 2. FEMALE OWNERSHIP SHARES ACROSS THE 10 MOST-COMMON INDUSTRIES

*Note:* These industries are restricted to those with at least 10 female-owned establishments.

### III. Differences in Female-Owned Establishments

Table 1 reports average characteristics of female-owned and male-owned establishments (Columns 1 and 2), along with differences for female-owned establishments relative to male-owned (Column 3). Column 4 reports similar differences, comparing establishments within the same state and decade.

Female-owned establishments have lower output, along with lower input expenditures on capital in particular. Total expenditure, as a share of total output, is slightly lower for female-owned establishments. This is consistent with greater input distortions faced by female-owned establishments, along with any differences in markups, whereby aggregate productivity would increase through reallocating inputs to more-distorted female-owned establishments (Chiplunkar and Goldberg, 2024; Hornbeck and Rotemberg, 2024).

Female-owned establishments employed a substantially higher share of female workers. These establishments are also substantially more likely to employ only female workers, which was rare among male-owned establishments, and more likely to employ

any female workers.<sup>2</sup> Female-owned establishments also paid female workers \$2 more per month, or roughly 20% more. The combination of higher quantities and higher wages for female workers suggests a greater demand for female workers among female-owned establishments, along with perhaps also a greater supply of female workers to female-owned establishments. Increased female business ownership could then expand employment opportunities for women and vice versa (as in Hunt and Moehling, 2024). By contrast, female-owned and male-owned businesses employed child workers at similar low rates.

Industry is an endogenous choice, reflecting sorting of female business owners based on different opportunities. Within 29 general industries (Column 5): female-owned establishments are even smaller than male-owned establishments; expenditure is a smaller share of output, consistent with greater distortions (though the capital ex-

<sup>2</sup>When owners were working on their own account, Census enumerators were supposed to include them in worker counts. If we subtract one female worker from female-owned establishments, and one male worker from male-owned establishments, female-owned establishments continue to employ a greater share of female workers, only female workers, and any female workers.

TABLE 1—ESTIMATED DIFFERENCES FOR FEMALE-OWNED MANUFACTURING ESTABLISHMENTS

Outcome:	Average Outcomes:		Difference for Female-Owned Establishments, Relative to Male-Owned:				
	Female-Owned	Male-Owned	(3)	(4)	(5)	(6)	(7)
1. Log Output Value	7.93 [1.05]	8.18 [1.27]	-0.249 (0.017)	-0.280 (0.016)	-0.490 (0.016)	-0.354 (0.017)	-0.316 (0.018)
2. Log Material Expenditure	7.08 [1.28]	7.26 [1.52]	-0.175 (0.020)	-0.207 (0.020)	-0.511 (0.019)	-0.371 (0.020)	-0.338 (0.021)
3. Log Labor Expenditure	6.25 [1.10]	6.60 [1.25]	-0.352 (0.017)	-0.366 (0.017)	-0.531 (0.017)	-0.305 (0.017)	-0.278 (0.018)
4. Log Capital Expenditure	4.06 [1.34]	4.50 [1.45]	-0.444 (0.021)	-0.469 (0.021)	-0.539 (0.020)	-0.395 (0.021)	-0.366 (0.021)
5. Capital / Total Expenditure	0.045 [0.048]	0.051 [0.052]	-0.0066 (0.0008)	-0.0068 (0.0007)	0.0003 (0.0007)	-0.0006 (0.0008)	-0.0006 (0.0008)
6. Expenditure / Output	0.776 [0.222]	0.785 [0.238]	-0.0091 (0.0035)	-0.0057 (0.0034)	-0.0179 (0.0034)	-0.0007 (0.0036)	-0.0024 (0.0037)
7. Female Share of Workers	0.412 [0.473]	0.046 [0.162]	0.366 (0.007)	0.363 (0.007)	0.200 (0.005)	0.059 (0.004)	0.052 (0.004)
8. Only Female Workers	0.363 [0.481]	0.008 [0.088]	0.355 (0.008)	0.354 (0.007)	0.297 (0.007)	0.101 (0.005)	0.090 (0.005)
9. Any Female Workers	0.459 [0.498]	0.097 [0.296]	0.362 (0.008)	0.357 (0.008)	0.118 (0.005)	0.040 (0.005)	0.034 (0.005)
10. Female Monthly Wage (\$) 1850 and 1860 Only	13.0 [5.6]	11.2 [6.3]	1.73 (0.20)	1.42 (0.20)	0.96 (0.20)	0.37 (0.23)	0.48 (0.26)
11. Child Share of Workers 1870 and 1880 Only	0.0287 [0.1153]	0.0262 [0.1071]	0.0025 (0.0023)	0.0015 (0.0023)	-0.0008 (0.0023)	-0.0041 (0.0025)	-0.0034 (0.0025)
12. Any Child Workers 1870 and 1880 Only	0.0833 [0.2764]	0.0824 [0.2750]	0.0009 (0.0056)	-0.0026 (0.0055)	-0.0134 (0.0055)	-0.0185 (0.0059)	-0.0158 (0.0059)
Number of Observations:	4,105	432,578	436,683	436,683	436,683	436,683	436,683
Included Fixed Effects:							
State-Year FE			No	Yes	Yes	Yes	Yes
Broad Industry-Year FE			No	No	Yes	Yes	Yes
Detailed Industry-Year FE			No	No	No	Yes	Yes
Detailed Industry-State-Year FE			No	No	No	No	Yes

*Note:* Columns 1 and 2 report average outcomes, with standard deviations in brackets. Columns 3 to 7 report differences for female-owned establishments, relative to male-owned establishments, conditional on the indicated fixed effects with robust standard errors in parentheses. We calculate annual capital costs as the book value of capital multiplied by a 7% interest rate. The sample is manufacturing establishments with: output  $\geq 500$ ; non-zero materials, labor cost, capital expenditure, and workers; average wages between \$1 and \$200; total input expenditures less than twice output. Row 10 has 812 and 19,818 observations, and Rows 11 and 12 have 2,473 and 245,077 observations, in columns 1 and 2.

penditure share is more similar, reflecting female owners sorting into less capital-intensive industries); and use of female workers continues to be substantially distinct, though more similar, reflecting female owners sorting into industries with greater female employment. Within 313 detailed industries (Column 6): female-owned establishments have lower output and inputs, by similar percentages indicating similar total factor productivity as male-owned establishments under constant returns to scale; have similar capital shares and total expenditure shares, consistent with selection into more-distorted sub-industries; more-similar employment of women; and are less likely to employ any child workers. Column 7 reports similar estimates, condi-

tional on detailed industry-state-year fixed effects.<sup>3</sup>

Table 2 reports average characteristics for linked female owners (Column 1), along with the difference from all women ages 14+ conditional on state-year fixed effects (Column 2). Female owners are older, more often literate/white/immigrants, and less likely married. They are more likely widows, with widows making up 40% of female business owners in 1880 (when reported directly in the Census). Female owners are more likely to report owning real estate themselves, though their household overall owns real estate at similar rates, and

<sup>3</sup>Estimates are similar restricting the sample to female-owned establishments linked to the Census of Population.

the average value of household real estate is higher. Female owners are more likely to have a child at home, but this result flips conditional on age fixed effects (Column 3). The distinctive characteristics of female owners suggests highly varied opportunities to become owners of manufacturing establishments, with interacting individual circumstances and social structures.

TABLE 2—DEMOGRAPHICS OF FEMALE OWNERS

Outcome:	Female Owners Avg	Difference from All Women 14+	
	(1)	(2)	(3)
Age	40.3 [12.8]	6.76 (0.36)	—
Literate	0.953 [0.211]	0.169 (0.007)	0.126 (0.006)
White	0.990 [0.102]	0.051 (0.004)	0.047 (0.004)
Immigrant	0.314 [0.464]	0.104 (0.013)	0.073 (0.013)
Married	0.333 [0.471]	-0.206 (0.013)	-0.354 (0.013)
Widowed	0.434 [0.496]	0.321 (0.026)	0.272 (0.023)
1880 Only			
Owns Real Est.	0.334 [0.472]	0.299 (0.016)	0.284 (0.015)
1850 - 1870 Only			
HH Owns Real Est.	0.531 [0.499]	0.027 (0.017)	0.003 (0.016)
1850 - 1870 Only			
HH Real Est. Value	3382 [9547]	787 (322)	699 (319)
1850 - 1870 Only			
Child at Home	0.650 [0.477]	0.115 (0.013)	-0.063 (0.013)
Observations:	1,247	42,049,669	42,049,669
Fixed Effects:			
State-Year FE		Yes	Yes
Age FE		No	Yes

#### IV. Conclusion

This paper uses new data to show how female-owned manufacturing establishments differed from male-owned establishments in the 19th century United States. Female-owned establishments were more prevalent in specialized industries, particularly women’s clothing and women’s hat making, but also present across manufacturing more broadly. Female-owned establishments were substantially smaller, across industries and within industries, potentially reflecting constraints that vary with social and financial institutions. Female-owned establishments employed more female work-

ers, and paid women higher wages, consistent with a virtuous cycle between increased female business ownership and increased female labor market participation. Our estimates highlight challenges and opportunities for women’s historical participation in business ownership that complement ongoing research across modern contexts.

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