

# Structural transformation over 150 years of men's and women's work

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Women's Work, Men's Work, and Development: Micro Data and Macro Outcomes  
AEA, January 6, 2024

# Background and motivation

- ▶ High-income countries witnessed a rise in female employment and gender convergence in earnings since WW2
- ▶ But not a universal phenomenon
  - ▶ female employment has been falling during other time windows and/or in other countries
  - ▶ evidence that female employment declines at early stages of development and then rises at later stages, in sync with fall in agriculture and rise in services.

# This paper

- ▶ Aim to understand various phases in the evolution of female and male employment through the lens of structural transformation
  - ▶ labour reallocation across agriculture, manufacturing and services
  - ▶ and marketization of home production
  - ▶ focus on unpaid family work
- ▶ Different sectors vary in productivity growth and female intensity
- ▶ Uneven productivity growth feeds into gender trends via differences in female intensity (gender comparative advantages)
- ▶ Mostly US historical evidence, 1870-2019.

# Approach

- ▶ Build consistent measure of market work by gender, US 1870-2019:
  - ▶ Extensive margin: persons in paid and unpaid market work.
  - ▶ Intensive margin: hours in paid and unpaid work.
    - Market work is U-shaped for women and declining for men.
- ▶ Unified framework for understanding these trends
  - ▶ Consumer preference for variety, uneven productivity growth, and income effects
    - structural transformation and marketization.
      - ▶ Decline in agriculture → fall in market work.
      - ▶ Marketization of home services → increase in market work.
  - ▶ The gender impacts of forces are mediated by within-sector gender intensity
    - ▶ Home services are female intensive → U-shape for women but not for men.

## Related work

- ▶ U-shape idea pioneered by Sinha (1965), Boserup (1970), Durand (1975), Goldin (1986)
  - ▶ Mostly cross country evidence (Goldin 1995); except Goldin (1990) – based on revision of 1890 Census statistics.
- ▶ Harmonized labor force and time use surveys across: U-shaped market work, hump-shaped domestic work (Doss et al 2023).
- ▶ Interplay between female work and rise in services modeled by Lee and Wolpin (2006), Akbulut (2011), Ngai and Petrongolo (2017), Rendall (2018), Bridgman et al (2018), Buera et al (2019), Cerina et al (2021).
  - ▶ framework and quantitative evaluation for recent decades

Data

# Employment definitions and measurement (I)

- ▶ ILO definition of employment covers *work for pay, profit or family gain in cash or kind* – i.e. including unpaid family workers
- ▶ ILO definition well established, but measurement is not consistent over time and in country-level sources
- ▶ U.S Census:
  - ▶ pre-1940: *gainful employment*; but with early (and inconsistent) attempts to capture some unpaid work when done “regularly” or “most of the time”
  - ▶ 1940–: *ILO employment*; but definition of unpaid work not entirely consistent over time and restrictive. Historical Statistics From Colonial Times to 1970, Ch.K
    - ▶ hired (paid) workers: if working any positive hours
    - ▶ unpaid workers: if working 15h+ per week
    - ▶ (Kendrick 1961, Lebergott 1966, Ramey and Francis 2009, Herrendorf et al 2014)
- ▶ Challenge: identifying unpaid family work when most widespread.

## Undercount of female unpaid work

- ▶ Early Census instructions reflected social attitudes towards women's employment and unstructured/unpaid nature of female work in agriculture (Smuts 1960).

### Example:

- ▶ 1890: about 40% population on farms
- ▶ about 4m white married women on farm
  - ▶ census reported about 23k in agricultural occupations.
- ▶ 1950: about 14% population on farm
  - ▶ nearly 200k as unpaid family laborers
- ▶ Also, 1888 Survey of 693 Farmers in Connecticut: in 94% of farms at least 1 female family member 'employed' (Carter et al 1993.)

# Adjustment for unpaid employment - Extensive Margin

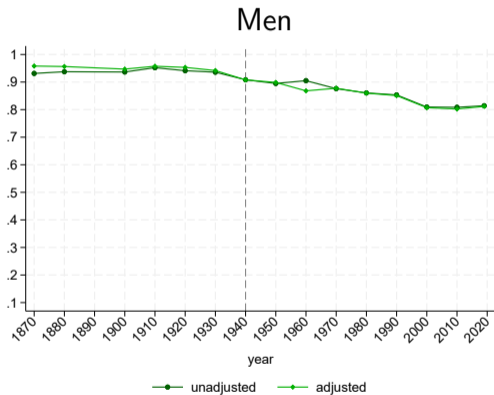
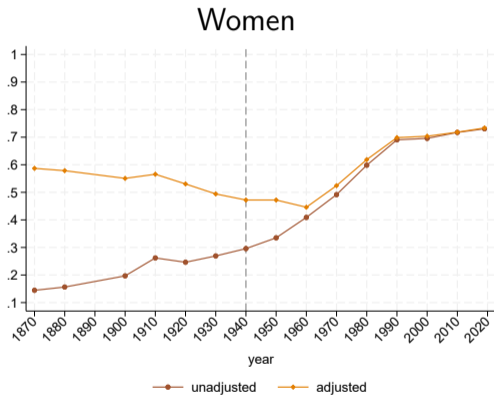
Ruggles (2015): importance of family enterprise in 19th century, through to mid-20th century. Family economy

- ▶ “production was carried out by families”;
- ▶ “all family members that were old enough contributed to farm production.”  
pop on farm
- ▶ Nonfarm family business: shoemakers, tailors, boarding etc.

Obtain unpaid employment using micro data at the household level:

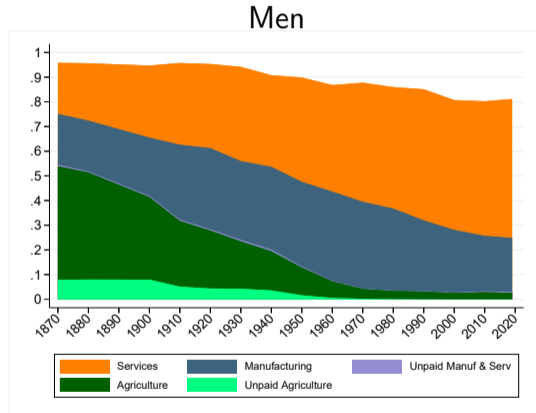
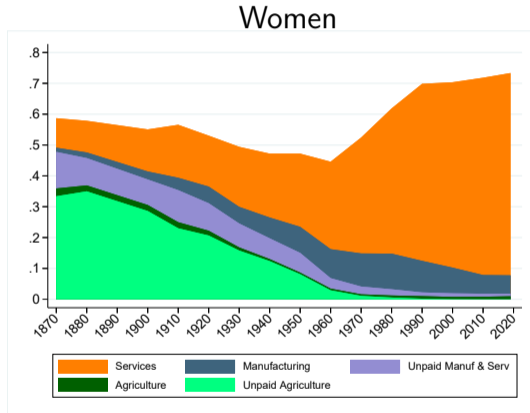
- ▶ Assign to labour force women on farms, whose head of household is farmer, whether or not they report an occupation.
- ▶ Method extended to non-farm families in which the head is self employed.

# US Employment by gender, 1870-2019



Note: Age 18-64, US Census. Marital Status

# Employment and Structural Transformation by Gender



Note: Age 18-64, US Census. Employment by Marital Status

# Market hours

- ▶ Intensive margin relevant as hours per employed vary widely over time and across genders and sectors.
- ▶ **Weekly hours fell substantially for all non-farm employees** (Costa, 2000)
  - ▶ 1880s: 10 hours per day, 6 days a week;
  - ▶ 1940: 8 hours per day, 5 days a week
  - ▶ Post 1940: further reductions via paid holidays, etc.
- ▶ **Unpaid hours on farm shorter than paid hours**  
(Surveys of farmers; Time-use studies).
  - ▶ 1870: Farm laborers worked 10-14h per day, 6 days a week.
  - ▶ 1920s: Housewives on farm spent 10-15h per week in unpaid agricultural work

## Paid hours: sources

- ▶ **Historical Statistics of the US, 1860-1930**

- ▶ Drawing from: Census of Manufacturers, Weeks Report, Aldrich Report, series produced by E Jones, A Rees and J Owen (Whaples, 1990)
- ▶ good coverage for manufacturing; by gender from 1914

- ▶ **Historical Labor Statistics Project, 1884-1901**

at U California (Carter, Ransom, Sutch, 1991)

- ▶ Drawing from Surveys of Workers by several state bureaus
- ▶ Complete dataset: about 100,000 workers in 14 states  
Our sample: 52.5k men and 25.5k women in 12 states
- ▶ Cover all 3 sectors, but thin on agriculture

- ▶ **Women Working project, 1920s and 1930s**

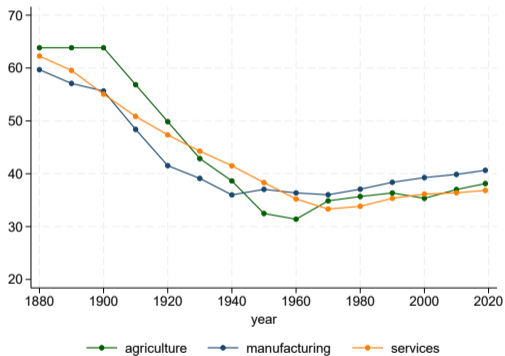
(Harvard University Library's Open Collections Program)

- ▶ 20-30 studies (mostly firm surveys), little info on men

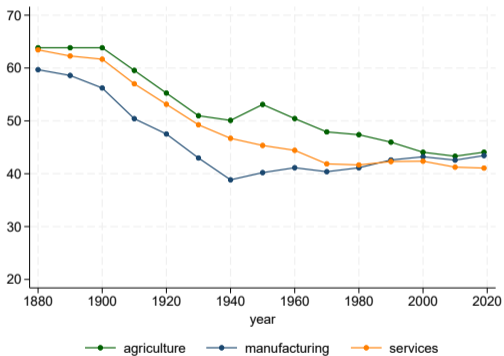
- ▶ **1940–: US Census**

# Paid hours per employed

## Women



## Men



Hours distribution

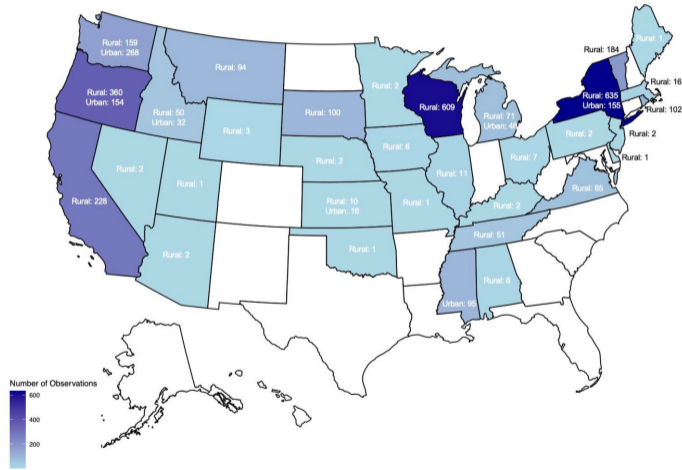
Gender gaps in paid hours

# Unpaid hours: sources

## **Purnell Diaries; 1920s-1950s**

- ▶ With 1925 Purnell Act, USDA funded nationally representative time-use survey of American *homemakers* (predominantly *rural*)
- ▶ Survey replicated across several state-level agricultural stations
- ▶ Combined sample of about 4,000 women, over 1924-53.

# Geographic distribution of USDA TU Studies, 1926–1953



Source: Gershuny and Harms (2016) household-level data and several tabulated studies.

# A 1929 TU diary

UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF HOME ECONOMICS  
WASHINGTON, D. C.

## DAILY TIME RECORD OF HOMEMAKER

Name Mr. John Doe

Address R. F. D. #1

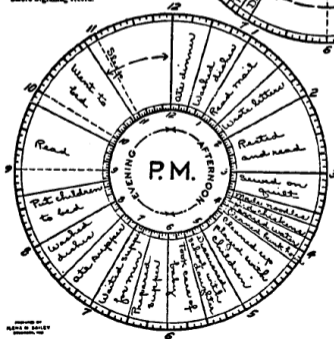
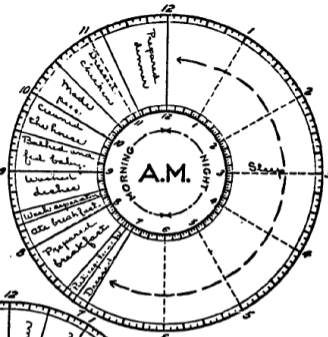
Boysen, Mont.

Day of week Monday

Date Feb. 9, 1929

Each small space between the lines on the "clock" represents five minutes. Begin this day's record by drawing a line on "A. M. clock" from outer to inner circles at time of arising. At end of time given to the next activity draw another line, and in space between lines describe this activity. Continue in this way changing to "P. M. clock" at noon and accounting for all of the 24 hours of the day.

Read separate "Instructions" carefully before beginning record.



NUMBER OF PERSONS

|                              | At each following location per day |            |       |               |
|------------------------------|------------------------------------|------------|-------|---------------|
|                              | Lodging                            | Restaurant | Store | Work or other |
| Family                       | 5                                  | 5          | 5     | 5             |
| Guests                       |                                    |            |       |               |
| Neighbors and household help |                                    |            |       |               |
| From table                   | 1                                  | 1          | 1     | 1             |
| TOTAL                        | 6                                  | 6          | 6     | 6             |

NOTES

## Unpaid hours estimates in Purnell Diaries

- ▶ Snapshot from subset of studies with information on farm hours by season (Oregon, Washington, Nebraska, Montana, Vermont, New York.)

|             | Weekly<br>Spring Hours                           | % Helping | Nobs |
|-------------|--|-----------|------|
| <hr/> <hr/> |  |           |      |
|             | All Homemakers                                   |           |      |
| 1920s-1930s | 14 (10)  | 99% (95%) | 900  |
| 1942        | 12   | 77%       | 140  |
| 1952        | 7.5  | 58%       | 180  |
|             | <hr/> Homemakers working 15+ farm hours per week |           |      |
| 1920s-1930s | 26   | 32%       | 663  |
| 1942        | 26.4   | 26%       | 140  |

Annual averages in parentheses. Excluding time to prepare meals for farm laborers/lodgers, about 2.3h (Bureau of Human Nutrition, 1944).

# Lower and upper bounds from Purnell Diaries and Census

## US Census from 1940–

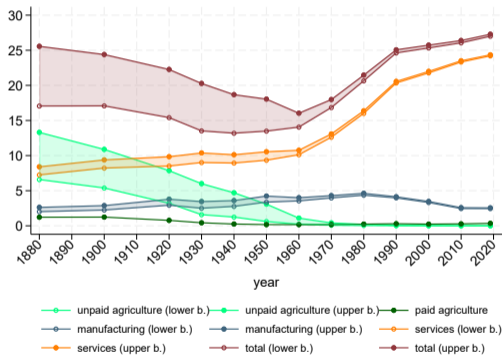
- ▶ unpaid women in agriculture work on average 32.7h in 1940 and 1950 ( $\approx 93\%$  of paid hours)
- ▶ (note different sample and definition from Purnell diaries)

## Estimates used:

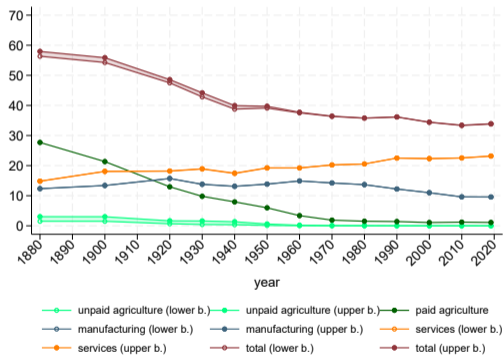
- ▶ *Lower bound from Purnell Diaries*: 15 for 1920-1930 (& backward trend extrapolation); 12 for 1940; and 7.47 for 1950-2019.
- ▶ *Upper bound from Census*: 33 for whole period.

# Market hours per person

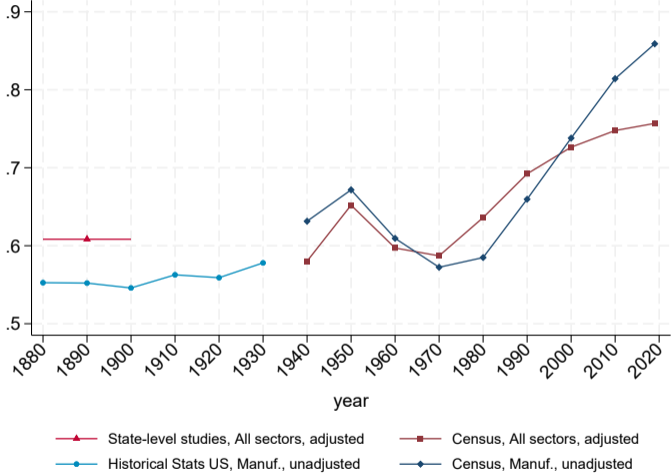
## Women



## Men



# Wage ratio (salaried workers)



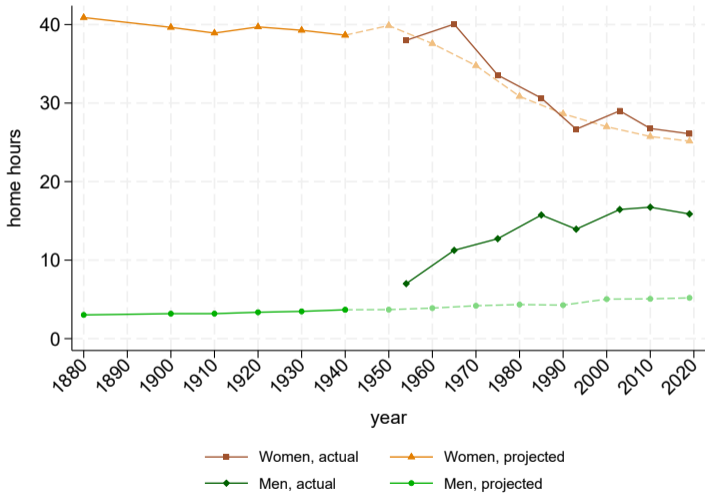
# Home production hours

- ▶ producing goods and services for *own use* (→ not market).
- ▶ enjoy the *output* not time spent (→ not leisure).

## Sources

- ▶ Harmonized Time Use Surveys for 1965–
- ▶ Purnell Diaries for 1920s-1950s
  - ▶ Extrapolated backwards using projections by demographic group (gender, employment status, rural/urban), as in Ramey (2009).

# Home production hours



Source: Purnell Diaries; US Census.

## Summary of evidence 1870-2019

- ▶ Important role of unpaid family work up until mid-20th century for understanding female employment and hours.
- ▶ U-shape in female employment, with 1960 as the turning point.
- ▶ Shallow, asymmetric U-shape in female hours: flat or slightly falling hours until 1950-60, then rising.
- ▶ Male hours and employment falling throughout.
- ▶ Gender convergence in home hours.
- ▶ Wage ratio essentially constant until about 1970, then rising.

Model

# The model economy: Building blocks

- ▶ **Households** derive utility from consumption of agriculture, manufacturing and service output
  - ▶ gross complements in utility (Baumol's relative price effects)
  - ▶ subsistence requirement on agricultural consumption (Engel's income effects)
- ▶ 3 market sectors: **agriculture, manufacturing, services**
  - ▶ productivity growth: agr , man > serv
  - ▶ female intensity: serv > agr, man
- ▶ **Family farms** are part of the agriculture sector.
  - ▶ Output sold to market; part of GDP.
- ▶ **Home production** makes close substitutes to market services; for own use.
  - ▶ Slower productivity growth than the service sector.

# Firms

- ▶ Production function for the representative firm:

$$Y_j = A_j N_j, \quad N_j = \left[ \xi_j l_{fj}^{\frac{\eta-1}{\eta}} + (1 - \xi_j) l_{mj}^{\frac{\eta-1}{\eta}} \right]^{\frac{\eta}{\eta-1}}; \quad j = a, m, s$$

- ▶  $A_j$ : sector-specific productivity, growing at  $\gamma_j$
- ▶  $\xi_j$ : sector-specific gender weight, capturing comparative advantages
- ▶ Competitive labor markets and perfect mobility:

$$w \equiv \frac{w_f}{w_m} = \frac{\xi_j}{1 - \xi_j} \left( \frac{l_{mj}}{l_{fj}} \right)^{1/\eta}; \quad j = a, m, s$$

# Households (I)

- Utility: consumption ( $a, m, z$ ) and leisure ( $l$ )

$$U(c_a, c_m, c_z, c_l) = \left[ \omega_a (c_a - \bar{c})^{\frac{\varepsilon-1}{\varepsilon}} + \omega_m c_m^{\frac{\varepsilon-1}{\varepsilon}} + \omega_z c_z^{\frac{\varepsilon-1}{\varepsilon}} \right]^{\frac{\varepsilon}{\varepsilon-1}}$$

with  $\varepsilon < 1$  and  $\bar{c} > 0$ .

- Services: produced at home or purchased from the market:

$$c_z = \left[ \psi c_s^{\frac{\sigma-1}{\sigma}} + (1 - \psi) c_h^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}}$$

with  $\sigma > 1$ .

## Households (II)

- ▶ Allocate time to market **work**, **home production** and **leisure**.
- ▶ Home production:

$$c_h = Y_h = A_h N_h, \quad N_h = \left[ \xi_h l_{fh}^{\frac{\eta-1}{\eta}} + (1 - \xi_h) l_{mh}^{\frac{\eta-1}{\eta}} \right]^{\frac{\eta}{\eta-1}}$$

- ▶ Leisure compound  $N_l$  is a function of male and female leisure:

$$c_l = N_l, \quad N_l = \left[ \xi_l l_{fl}^{\frac{\eta_l-1}{\eta_l}} + (1 - \xi_l) l_{ml}^{\frac{\eta_l-1}{\eta_l}} \right]^{\frac{\eta_l}{\eta_l-1}}$$

with  $\eta_l < 1$ .

- ▶ Budget constraint:

$$\sum_{i=a,m,s} p_i c_i \leq w_m (L_m - l_{mh} - l_{ml}) + w_f (L_f - l_{fh} - l_{fl})$$

# Assumptions

- ▶ **Comparative advantages**

- ▶  $(\xi_s, \xi_h) > (\xi_a, \xi_m)$  : service production more intensive in female labour than agriculture and manufacturing.

- ▶ **Uneven productivity growth**

- ▶  $\gamma_s > \gamma_h$  : productivity growth faster in market than home services.
- ▶  $(\gamma_a, \gamma_m) > \gamma_s$  : productivity growth is slowest in services

# Marketization

- ▶ Female and male labor allocation depend on relative expenditures:

$$\frac{l_{fk}}{l_{fj}} = \frac{l_k(w)}{l_j(w)} E_{kj}; \quad \frac{l_{mk}}{l_{mj}} = \left[ \frac{\xi_j (1 - \xi_k)}{(1 - \xi_j) \xi_k} \right]^\eta \frac{l_k(w)}{l_j(w)} E_{kj}; \quad \forall j, k.$$

- ▶ Relative expenditures: market vs home services

$$E_{sh} \equiv \frac{p_s Y_s}{p_h Y_h} = \left( \frac{A_s}{A_h} \right)^{\sigma-1} \left( \frac{\psi}{1 - \psi} \right)^\sigma g_{sh}(w).$$

# Structural transformation

- ▶ Manufacturing vs (total) Services

$$E_{mz} = \left( \frac{A_m}{\left[ A_s^{\sigma-1} \psi^\sigma + g_{sh}^{-1}(w) A_h^{\sigma-1} (1 - \psi)^\sigma \right]^{\frac{1}{\sigma-1}}} \right)^{\varepsilon-1} \left( \frac{\omega_m}{\omega_z} \right)^\varepsilon g_{mz}(w),$$

- ▶ Agriculture vs (total) Services

$$E_{az} = \frac{1}{1 - \frac{\bar{c}}{y_a}} \left( \frac{A_a}{\left[ A_s^{\sigma-1} \psi^\sigma + g_{sh}^{-1}(w) A_h^{\sigma-1} (1 - \psi)^\sigma \right]^{\frac{1}{\sigma-1}}} \right)^{\varepsilon-1} \left( \frac{\omega_a}{\omega_z} \right)^\varepsilon g_{az}(w),$$

## Total work vs leisure

- ▶ Equilibrium reduces to 3 equations solving for female leisure time  $I_{fl}/L_f$ , agriculture output  $y_a$  and gender wage ratio  $w$ .

$$\frac{I_{fl}}{L_f} = \frac{I_l(w)}{I(w) \left[ \frac{E_{ml}(w)}{(1-\bar{c}/y_a)\bar{E}_{ma}(w)} + \sum_{i \neq a} E_{il}(w) \right]}.$$

where  $I_l$  and  $I$  are both function of gender wage ratio.

- ▶ Income effect on leisure (total work) through subsistence consumption.

# Labour reallocation

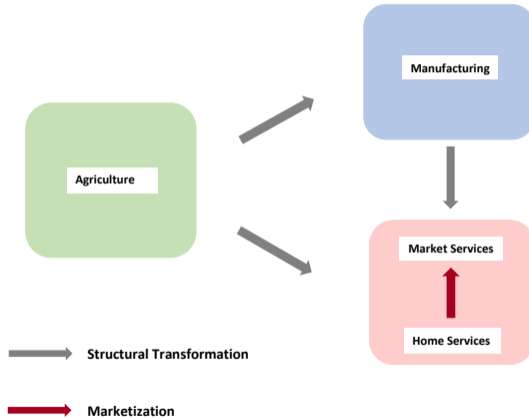
## Structural transformation

- ▶ Faster productivity growth in agriculture and subsistence consumption reallocates labour **away from agriculture**:
  - ▶ Substitution effect through consumption complementarity ( $\varepsilon < 1$ )
  - ▶ Income effect through subsistence consumption ( $\bar{c} > 0$ ): non-homothetic preferences; as income rises expenditure in agricultural output falls
- ▶ For same reason: faster productivity growth in manufacturing reallocates labour **from manufacturing into services**

## Marketization

- ▶ As home and market services are good substitutes, faster productivity growth in market services reallocates labour **from home to market services**

# Predicted Labour Reallocation



# Stage 1: Structural Transformation and Decline in Agriculture

- ▶ 19th century; large agricultural sector.
- ▶ Structural transformation dominates marketization  
 $\gamma_a > (\gamma_s, \gamma_h)$ ,  $\bar{c}/y_a$  large;  $\gamma_s - \gamma_h > 0$  but small.
- ▶ → Agriculture declines, services expand (home & market), leisure increases.  
→ market hours fall.
- ▶ Both male and female hours decline.
- ▶ Interplay between agriculture and services delivers declining market hours.
- ▶ Role of manufacturing depends on differential  $\gamma_a - \gamma_m$ .

## Stage 2: Marketization and Rise in Services

- ▶ Mid-20th century, the share of agriculture is small and subsistence consumption less relevant ( $\bar{c}/y_a$  small).
- ▶ Structural transformation limited to reallocation from manufacturing to services.
- ▶ Large service share, strong marketization.  
→ market services rise and home production falls.
- ▶ Market services are intensive in female labour.  
→ rise in female market hours.
- ▶ Manufacturing is intensive in male labour.  
→ male hours fall, reflecting deindustrialization.

Uneven productivity growth and gender specialization: may induce U-shape in female hours and monotonically declining male hours.

Quantitative illustration

# Quantitative illustration of model properties

Dynamics of market hours by gender driven by:

- ① Structural transformation and marketization .
- ② Gender-specific demand shifts ( $\xi_a, \xi_m, \xi_s$ ):
  - ▶ Gender 'biased' technological changes.
  - ▶ Within-sector compositional change (eg disappearance of family farms).
  - ▶ Evolution in gender norms or policies regarding female work.
- ③ Gender-specific population changes  $L_f/L_m$ .

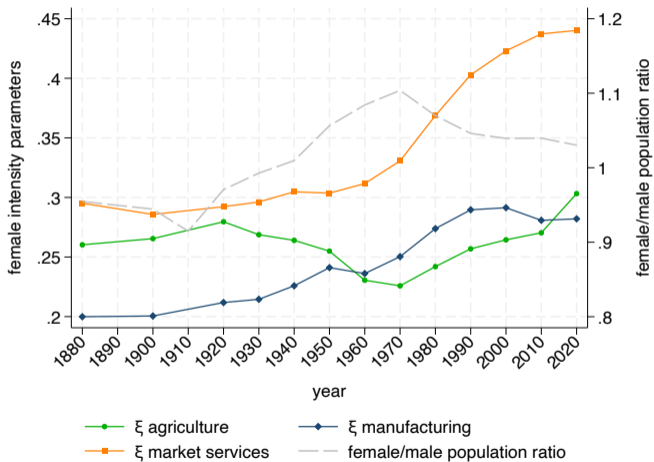
# Calibration

- ▶ Borrow elasticity parameters  $(\eta, \sigma, \epsilon)$  from existing calibration
- ▶ Productivity growth rates  $\gamma_j$  from available data
- ▶ Match time allocation and wage ratio in period  $T = 1950$ : pin down gender-specific demand  $\{\xi_{aT}, \xi_{mT}, \xi_{sT}, \xi_h, \xi_l\}$ ; preference parameter  $\phi$ ; productivity terms  $\{A_{shT}, A_{msT}, A_{maT}\}$
- ▶ For other periods  $t$ :
  - ▶ Productivity growth implies values for  $\{A_{sht}, A_{mst}, A_{mat}\}$
  - ▶ Gender-specific demand  $\xi_{jt}$  from FOC and gender-specific population  $L_f/L_m$  from data
- ▶ Set the strength of the income effect  $\bar{c}$  to match the agriculture employment share in 2019.

# Calibrated parameters

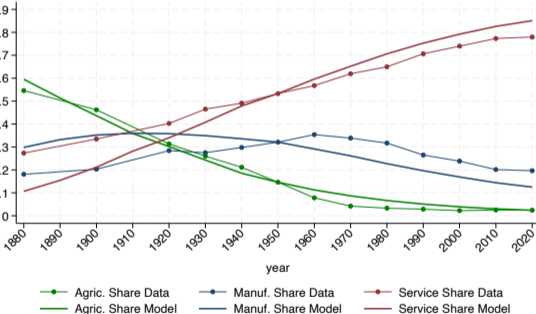
| Parameters                     | Values           | Data or targets  |
|--------------------------------|------------------|--|
| <i>Model free parameters</i>   |                  |  |
| $\gamma_a, \gamma_m, \gamma_s$ | 3.6%, 2.5%, 1.4% | BEA for 1950-2020                                      |
| $\gamma_h$                     | 0.6%             | Bridgman et al. (2022) for 1950-2020                   |
| $\sigma$                       | 2                | Various estimates in Aguiar et al. (2012)              |
| $\epsilon$                     | 0.002            | Herrendorf et al. (2013)                               |
| $\eta, \eta_l$                 | 2, 0.2           | Ngai and Petrongolo (2017)                             |
| $L_{ft}/L_{mt}$                | Figure 11        | Census data  |
| <i>Baseline parameters</i>     |                  |  |
| $A_{aT}L_{fT}$                 | 1                | Normalization  |
| $\phi$                         | 0.96             | Relative hours in leisure vs manufacturing in 1950     |
| $\xi_h, \xi_l$                 | 0.59, 0.26       | Wage ratio and hours ratio in home and leisure in 1950 |
| $\hat{A}_{maT}$                | 0.33             | Relative hours in manufacturing vs agriculture in 1950 |
| $\hat{A}_{msT}$                | 7.65             | Relative hours in manufacturing vs services in 1950    |
| $\hat{A}_{shT}$                | 0.93             | Relative hours in market services vs home in 1950      |
| $\xi_{aT}, \xi_{mT}, \xi_{sT}$ | 0.22, 0.24, 0.3  | Wage and hour ratio in market sectors in 1950          |
| $\bar{c}$                      | 0.014            | Agriculture employment share in 2019                   |
| $\xi_{at}, \xi_{mt}, \xi_{st}$ | Figure 11        | Equilibrium condition (8)                              |

# Gender-specific factors

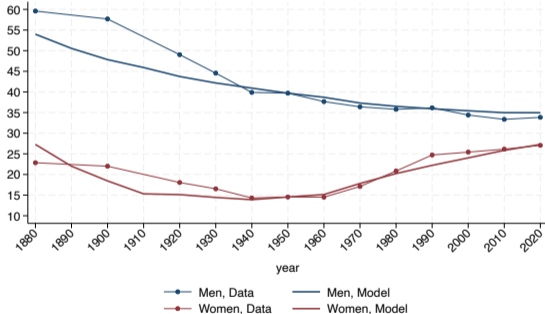


# Structural Transformation and Market Hours by Gender

## Structural Transformation



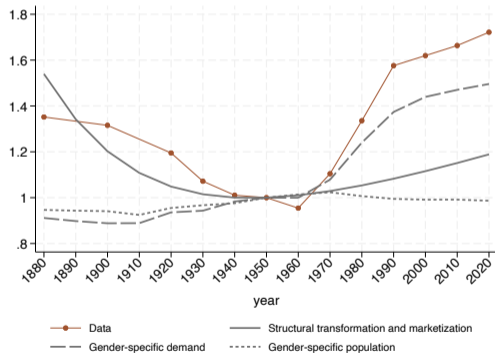
## Market Hours by Gender



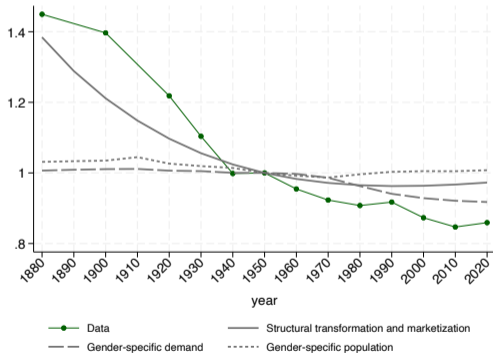
# Market hours: decomposition of various forces

(all normalized to 1950)

## Women



## Men



# Pre-1950 Productivity Growth I

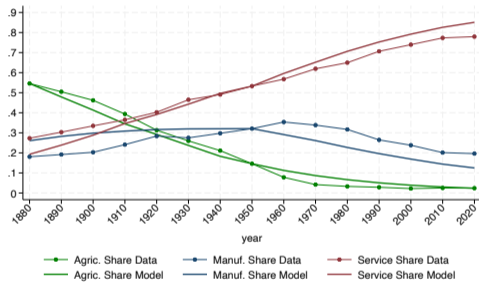
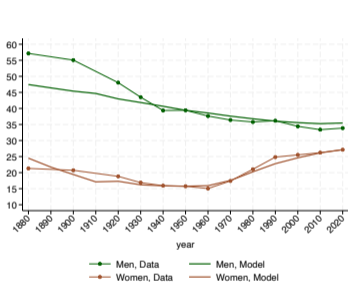
Baseline uses constant growth: 1950-2020 values (3.6%, 2.5%, 1.6%, 0.6%).

- ▶ For manufacturing and services up to 1900:
  - ▶ Gallman (1960) for manufacturing and Gallman and Weiss (1969) for services.
  - ▶ Productivity growth 1880-1900: 2.6% for manufacturing and 1.3% for services.→ keep constant productivity growth for manufacturing and services.
- ▶ Farm data from Kendrick (1961): agriculture productivity growth at 2.1%.
  - ▶ Lower agriculture productivity growth relative to manufacturing linked to the observed relative farm prices (fell after 1930s).→ Agricultural productivity growth increases from 2.1% to 3.6%.
  - ▶ Could reflect compositional effects linked to decline of family farm.

## Pre-1950 Productivity Growth II

- ▶ Assume home productivity growth is 1.4% pre-1950 (same as market service).
    - ▶ Bridgman (2016) estimates home productivity at 2.1% for 1929-1950.
    - ▶ Improvement in home technology brought by diffusion of basic facilities such as electricity and water, and household durables such as refrigerator, washer and vacuum (Greenwood et al 2005 and Vidart 2023).
  - ▶ Objective is to understand how much structural transformation can contribute to the decline in market hours. To make up for the decline in agriculture, allow a preference shift  $\uparrow \omega_m/\omega_s$ .
    - ▶ Comin et al (2021) changes in  $\omega_j$  in the CES can capture the income effect in a more general non-homothetic CES utility function.
- Reconcile the mild increase in  $p_a/p_m$  with the fall in agricultural employment.

# Predictions, Varying Productivity Growth

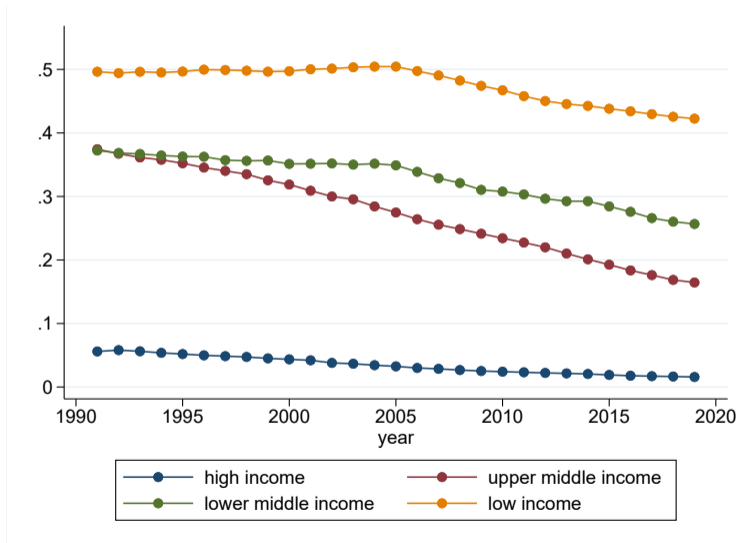


MT+ST alone predicts the pre-1950 decline in market hours: 32% (female) 22% (male).  
Predicted  $p_a/p_m$  matches the 0.5% rise during 1880-1950 in the data.

# Conclusions

- ▶ Female employment declines at early stages of development, and then rises again
  - in sync with decline in agriculture and rise in services
- ▶ Male employment declines throughout
  - in sync with decline in agriculture and manufacturing
- ▶ Build a measure of male and female work during 1870-2019 in the US
  - ▶ *Early stage*  
Structural transformation: shrinking agriculture and rising services, home production and leisure  
Male and female work decline
  - ▶ *Later stage*  
Reallocation from manufacturing to services & marketization of home services  
Female work increases and male work declines

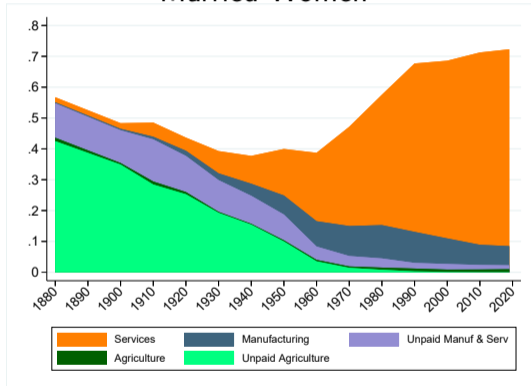
# Unpaid family workers as % of employment



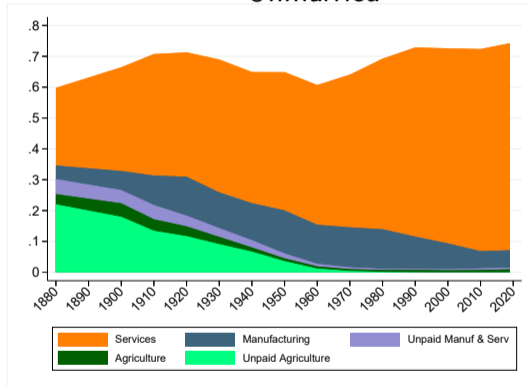
Notes: groups according to GNI pc. Source: WDI & ILO. [back](#)

# Employment and Structural Transformation by Marital Status

## Married Women



## Unmarried



Note: Age 18-64, US Census.

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# Wage equations, 1884-1901 (HSUS)

|                    | All                       | All                       | M+S                       | M+S                       | M+S                      | All                      |
|--------------------|---------------------------|---------------------------|---------------------------|---------------------------|--------------------------|--------------------------|
| female             | <b>-0.884</b><br>(0.0552) | <b>-0.511</b><br>(0.0309) | <b>-0.606</b><br>(0.0329) | <b>-0.497</b><br>(0.0283) | <b>-0.676</b><br>(0.140) | <b>-0.659</b><br>(0.124) |
| skilled            |                           | 0.201<br>(0.0246)         |                           | 0.223<br>(0.0269)         | 0.205<br>(0.0201)        | 0.202<br>(0.0204)        |
| clerical           |                           | 0.245<br>(0.0441)         |                           | 0.272<br>(0.0472)         | 0.300<br>(0.0375)        | 0.292<br>(0.0322)        |
| prof               |                           | 0.619<br>(0.0618)         |                           | 0.633<br>(0.0617)         | 0.551<br>(0.0247)        | 0.552<br>(0.0237)        |
| f × sk             |                           |                           |                           |                           | 0.176<br>(0.197)         | 0.126<br>(0.178)         |
| f × cl             |                           |                           |                           |                           | 0.0754<br>(0.216)        | 0.0954<br>(0.212)        |
| f × prof           |                           |                           |                           |                           | 0.343<br>(0.200)         | 0.379<br>(0.204)         |
| controls           | study FE                  | study FE                  | study FE                  | study FE                  | study FE                 | study FE                 |
| Obs                | 55611                     | 52004                     | 45776                     | 44751                     | 44751                    | 52004                    |
| Adj R <sup>2</sup> | 0.562                     | 0.605                     | 0.441                     | 0.522                     | 0.525                    | 0.608                    |

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