An Economic History of Fertility in the U.S.: 1826 - 1960

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Summary

- **Motivation:** Modeling fertility decisions is challenging. Try to identify facts that will be useful for future modeling.

- **Data:** U.S. Census data for 1900-1990, to build 5-year cohorts between 1826 and 1960.
  - Focus on married women, who have completed fertility.
  - Data on their age and Children Ever Born (CEB), and husbands' occupation/education.

- **Questions:** What is the relationship between fertility and income? How much of fertility drop comes from negative time invariant relationship with income?

- **Findings:**
  - Strong negative relationship. Overall income elasticity of -0.38.
  - Shifted income distribution can explain a big share (up to 90%) of reduction in fertility.
  - But observe deviations from time invariant, isoelastic relation.
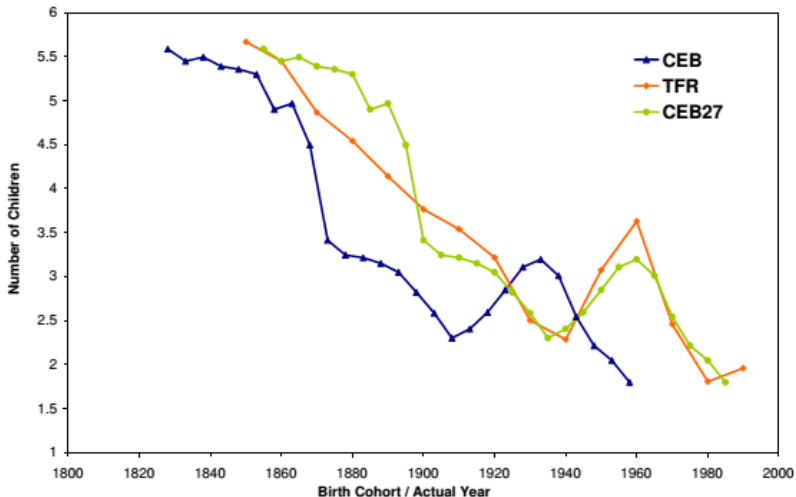 - Reduction in elasticity over time.

Outline

Total Fertility

Figure 1: CEB by Birth Cohort.

Total Fertility

- Fertility was **roughly constant** at 5.5 until 1850 (1870).
- **Steep decline** around 1870 (1900).
- **Baby bust** around 1910 (1930), followed by **baby boom** of 1930 (1950).
- **Common Hypotheses**:
    1. Fertility was **delayed**: NO. Data here is by cohort.
    2. **Reduction in marriage**: NO. Data here is on married women.
- **Total Fertility Rate** (TFR) is another measure of fertility, based on given year (not cohort).
    - It **mixes** fertility decisions of all birth cohorts alive at the time.
    - With declining fertility, it overestimates (underestimates) fertility of young (old).
    - So decline in CEB is faster than in TFR.

Diversity

Figure A2: Number of Children.
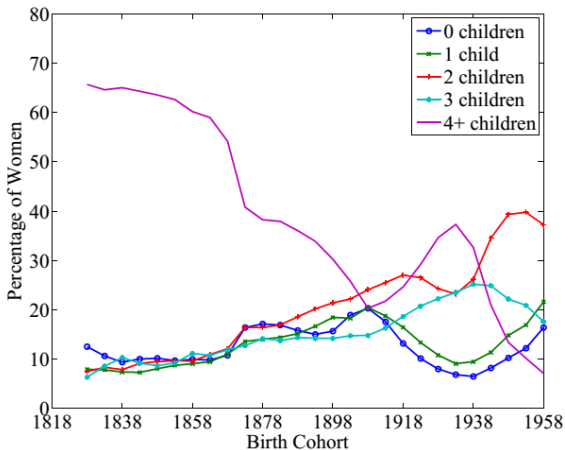
Similarly, observed reduction in **standard deviation of CEB**.
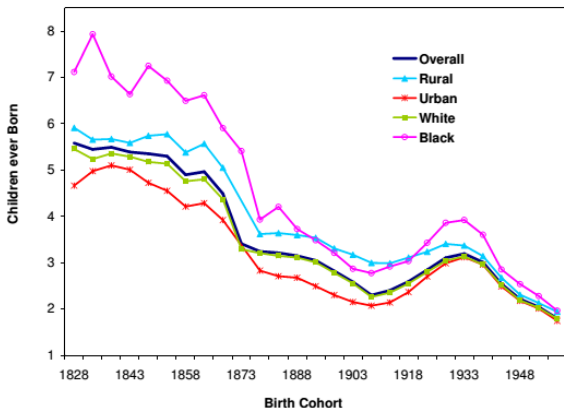
Compositional Arguments

One **common hypothesis** is that:

- There are groups with different **constant fertilities**.
- **Relative sizes** of groups have changed.

Some of the **proposed groups** are: urban vs. rural, region, race, immigrant. But main features of US fertility history are **common across them**.
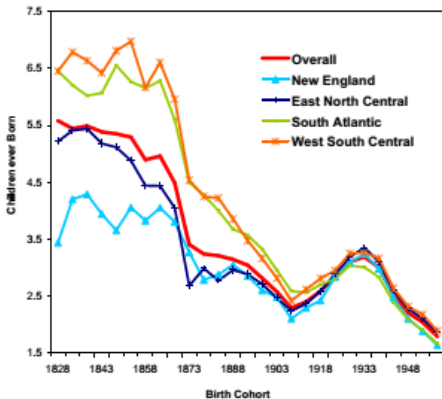
Compositional Arguments

Figure 3: CEB by Sub-Groups.

- Differences are quite **stable**, and **narrowing**.
- **Fertility decline** is not from movement between groups.

Compositional Arguments

Figure A4: CEB by Region.

- Differences were substantial earlier, but also **narrowing**.
- But proportion of women living in "low fertility region" is shrinking. Does not explain fertility decline.

Negative Income Elasticity $+$ Increasing Income

So far we have seen that **delayed fertility** and **reduced marriage** do not seem to explain shifts. Similarly, *observable* **compositional arguments** fail.

Another **popular hypothesis** is that:

- There is a **negative relationship** between fertility and income. (Ex: Time Intensive Children/Opportunity cost model)
- **GDPpc growth** pushes people into low fertility range.
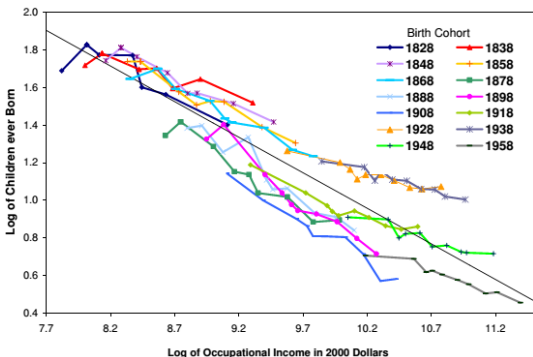
So main questions are:

- Is it a **move along** a time independent relationship?
- Or was there a **shift of** the relationship instead?

To **proxy income** in Census data, use

- Occupation of husband.
- Occupational Income Score (OIS) $\rightarrow$ misses temporary shocks. Focus on lifetime earnings instead.
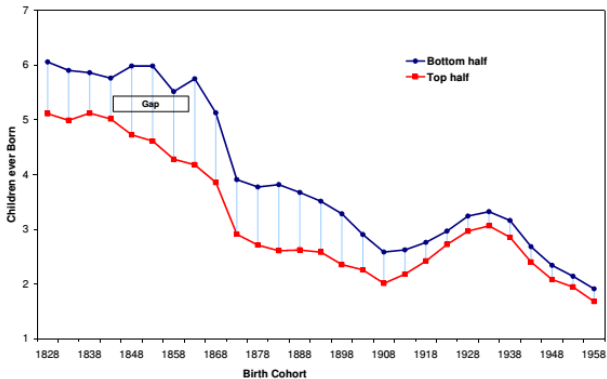
Negative Income Elasticity + Increasing Income

Figure 5: CEB by Occupational Income.

- Negative relationship when women did not work: problem for opportunity cost model.
- Relationship looks surprisingly **time invariant**.
- But there are systematic **deviations**.

Less Income Sensitive
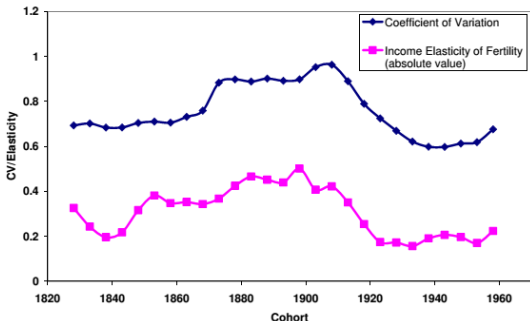
Figure 7: CEB by Top and Bottom Half of the Income Distribution.

- Rich reduce fertility first (gradually), increasing gap.
- Then fertility has become compressed.

Reduction of Elasticity

Figure 8: CV of Fertility and Income Elasticity.

- Implies that fertility compression, was not just from compression in income.
- Moreover, with updated CPS data, elasticity closer to 0.

What if we use education?

Basically, the pattern is **very similar**:

- Substantial **negative relationship**.
- Considerable **increase in education** over the 100 years.
- Relationship is quite **stable**, but there is a **downward shift** as well.

For more recent census, we can combine both **husband and wife educations**.

- **CEB is declining in both**.
- Also add positive assortative mating, and effect is larger.

Elasticities by Groups

We saw:

- Decline was not even across the income distribution.
- Non-monotonicity of income elasticities.

Question: Are elasticities by groups the same?

Finding: Not the same, but quite similar.

Elasticities by Groups

Table 4: Income Elasticity of CEB by Groups.

Group	Intercept	Income Elasticity	OI	CEB	log(CEB) gap explained by log(income) gap**
All	4.82	-0.38	19,941	3.57	
By Location					
Urban	4.66	-0.37	21,751	3.21	B
Rural	4.64	-0.35	18,294	3.95	53%
Farm	4.46	-0.33	14,108	4.28	69%
Non-Farm	4.65	-0.36	21,109	3.30	B
By Race					
Black	5.29	-0.42	15,944	4.52	47%
White	4.71	-0.37	20,252	3.49	B
By Immigration Status*					
Foreign Born*	5.78	-0.48	14,287	4.06	none***
US born, Foreign Parents*	5.05	-0.41	15,050	3.66	57%
US born, US parents*	4.88	-0.39	13,882	3.84	B
By Region					
New England	3.43	-0.24	21,105	3.05	B
East North Central	4.26	-0.32	20,146	3.42	26%
South Atlantic	5.60	-0.45	19,193	4.06	29%
West South Central	5.39	-0.43	19,006	4.25	26%

* Immigration status is available only for the cohorts between 1828 and 1928.

** relative to benchmark (B) category.

*** Foreign born Americans have higher incomes *and* higher fertility than US born, US parents.

- **Urban vs. Rural:** Very similar. CEB difference from income.
- **Region:** Biggest difference. "Regional fixed effects"?
- **Comp. effects?** No. Pattern over time holds within groups.

Outline

Conclusion

Facts to keep in mind when modeling fertility.

- Fertility has **decreased** substantially since 1820s.

- **Less diversity**:
  - Stable 10-20 % having 0 or 1 children.
  - Less families having 4+ children.

- **Marriage** reduction does **NOT** explain it.

- **Compositional arguments** (urban vs. rural, region, race, etc) are **NOT** key. Patterns are similar across groups.

- CEB **Income elasticity**:
  - Apparently **stable negative** relationship, but with **deviations**.
  - **Income sensitivity** has reduced over time.
  - **Compression of fertility** is NOT just from **income compression**. **What then?**