WEB APPENDIX

Did Improvements in Household Technology Cause the Baby Boom?
Evidence from Electrification, Appliance Diffusion, and the Amish

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Appendix 1. Household and Market Equipment Price Series

The information presented here supplements the discussion in section I of the paper, which notes that differential trends in price series might reveal evidence of differential trends in sector-specific technological progress. In this case, where the pace of improvement in home production technology relative to market production technology is of particular interest, one can examine the price of equipment used for home production relative to the price of equipment used for market production. We are wary of the problems associated with constructing and interpreting such data series over long periods of time, and we describe these concerns in greater detail here for completeness.

Several issues obscure the interpretation of the price series in the context of our investigation. First, the goods-of-interest are likely to have experienced rapid quality gains early in their product cycles, and an accurate price series should incorporate adjustments for these quality gains. Griliches (1971) and Gordon (1990) discuss these issues at length. The standard Bureau of Economic Analysis (BEA) price series, and therefore the quantity series that rely on them, do not make such adjustments for the period of time and the goods that are important here. Second, although Gordon (1990) provides quality-adjusted price information for the post-1947 period, there is little quality-adjusted information for earlier years. Third, important early improvements in household production, such as running water and canned goods, are not incorporated in durable good or appliance price series. Fourth, capital goods are inputs to household and market production; their prices are not measures of home or market productivity *per se*.

With these caveats in mind, if one takes the BEA price series at face value, it appears that the price of consumer durables, expressed relative to the price of private investment in equipment, increased sharply in the early 1940s and then gradually declined (appendix figure 1.1). It was not until 1955 that the relative price returned to its 1940 level, by which time the baby boom had nearly peaked. If we focus on the household appliance subset of consumer durables, it appears that from 1929 (when the series starts) to 1941 the series declines, then there was a sharp increase during the war, and a resumption of the pre-existing trend downward after the war. By 1950, the relative price had returned to its level in 1940, but in the meantime the fertility rate had increased from 80 to 106 (compared to 118 in 1960). Both relative price series from the BEA suggest that the baby boom was launched during a period of relatively high prices for equipment used in home production.[1]

Gordon (1990) shows that adjusting the prices of durable goods for changes in quality can make a large difference in the post-war price trends. This implies that the failure to incorporate quality adjustments in the BEA series can lead to large biases over long periods of time, and the biases need not be similar in the price series for different goods, so they would not simply difference out in a relative series. According to Gordon's series, there was no decline in the relative price of consumer durables from the late 1940s onward (appendix figure 1.2). There was, however, a notable decline in the relative prices of specific household appliances, with considerable variation depending on the appliance and adjustments for energy efficiency.[2] Because the series start in the late 1940s, it is impossible to infer whether the relative price declines reflect a return to a pre-existing trend after a wartime price shock (as suggested by the BEA appliance price series), accelerating productivity in the production of household equipment, or neither. Moreover, it is difficult to put the quality-adjusted decline for any specific appliance into quantitative perspective without having a longer and broader set of historical examples.[3]

It is apparent that improvements to the price series could have serious implications for macroeconomic studies that rely on long time series of national accounts data. Rather than attempt to resolve those issues in this paper, we go on (in section II of the paper) to provide direct analyses of the correlations between actual appliance diffusion and fertility rates from 1940 to 1960. The analyses directly assess whether there is a positive link between the spread of new household technologies and the baby boom.

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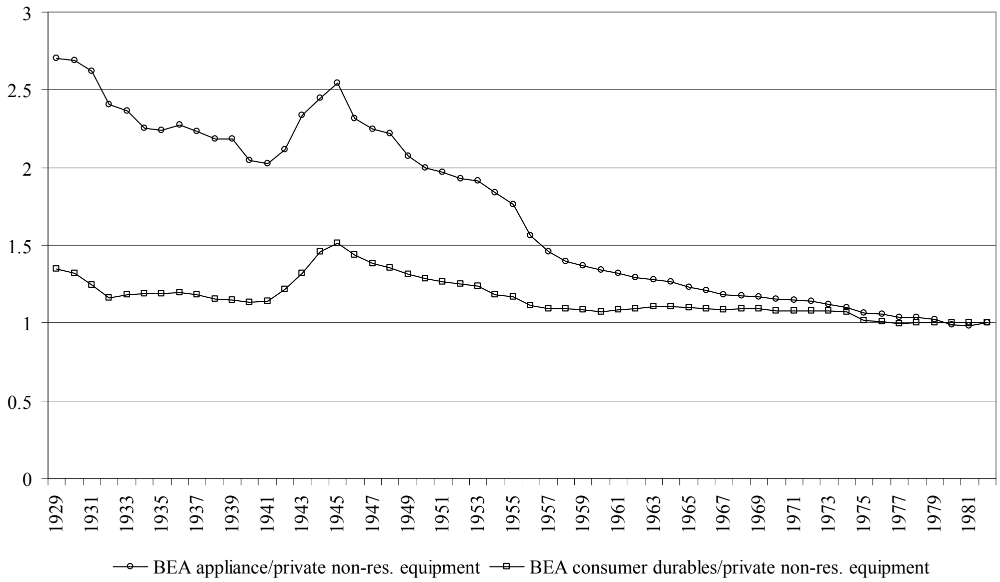
[1] Data are drawn from Table 1.6.4. Price Series for Gross Domestic Purchases and Table 2.4.4. Price Indexes for Personal Consumption Expenditures by Type of Product, from the BEA website: http://www.bea.gov/national/nipaweb/Index.asp.

[2] The numerator of the washing machine plot is based on the *Consumer Reports* series (Gordon 1990, column 5 of table 7.12), which has a larger decline than the series based on Sears catalogs. The denominator is the producer durable equipment deflator (Gordon 1990: 541).

[3] Assessing pre-war innovations of great value, such as running water and electric irons, would be important in this regard, as would be incorporating quality improvements in stoves, ranges, refrigerators and iceboxes.

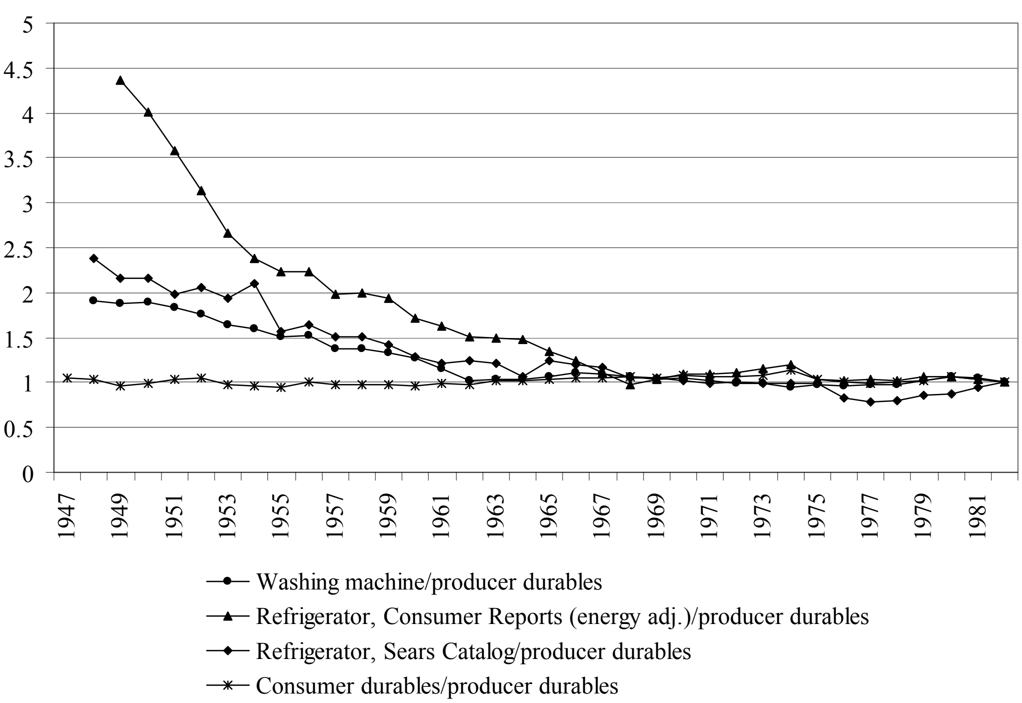
Appendix Figure 1.1. Relative Price of Consumer Durables,

BEA Price Indexes, 1982=1



Appendix Figure 1.2. Quality-Adjusted Relative Price of Consumer Durables,

Gordon Price Series, 1982=1



Appendix 2. Data Sources

County-level data

Data for infants per woman aged 15 to 44 and for the proportions of homes with lights (in 1940), refrigerators (in 1940 and 1950), and washing machines (1960) are from the files compiled by Michael Haines (2004). Specifically, files "32: 1940 Census I", "33: 1940 Census II", and "70: 1947 County Data Book" provide demographic and economic data for 1940. Files "35: 1950 Census I", "36: 1950 Census II", "72: 1952 County Data Book" and "73: 1956 County Data Book" provide data for 1950. Files "39: 1960 Census II", "40: 1960 Census III", "74: 1962 County Data Book", and "75: 1967 County Data Book" provide data for 1960. In 1950 and 1960 the housing appliance data are based on subsamples of the full population.

We typed in the data for electric lights in 1950 and for cooking fuel in 1940, 1950, and 1960 from the published volumes of the *Census of Housing*, and combined that information with the data from Haines (2004) described above. For 1940, the cooking fuel figures are from Volume 2, Table 23 (for each state) of the *Census of Housing*. For 1950, the lighting and cooking fuel figures are from Volume 1, Table 27 (for each state) of the *Census of Housing*. For 1960, the cooking fuel figures are from Volume 1, Tables 16 and 29 of the *Census of Housing*.

The proportion of homes with "modern stoves" is the ratio of the number using electricity, utility gas, or bottled gas for the principal cooking fuel divided by the total number of units that report the cooking fuel variable; implicitly, we define those using wood, coal, kerosene, "other", or no fuel as "not modern." The "mechanical refrigerator" variable pertains to any type of refrigeration equipment powered by electricity, gas, kerosene, or gasoline; this is distinct from an "ice box." The "washing machine" variable that is reported in the Haines files for 1960 includes "automatic and semi-automatic" washing machines that wash, rinse, and damp dry the laundry; "washer-dryer combination" machines that wash, rinse, and fully dry the clothes in the same tub; and power-operated "wringer or spinner" machines.

We made the following adjustments to the data from Haines (2004):

1. In 1940, the proportion of housing units with refrigerators in Raleigh County, West Virginia should be 41.8 percent, and the proportion in Washington, DC should be 79.1 percent. The median years of schooling for women and men in Cooke County, Texas should be 8.9 and 8.3 respectively. The county code for Warwick, Virginia is adjusted in 1940 to facilitate merger across datasets.

2. In 1950, approximately 40 counties with missing values for refrigerators in the 1952 County Data Book (underlying the Haines data) are listed as zeros in the Haines files. We referred back to the original Census volumes to fill in the correct figures when possible, or to set the value to

"missing" if unavailable in the Census (replacing zero). Separately, the proportion of housing units with refrigerators in Washington, DC should be 92.0. In 1960, the figure for washing machines in Lee County, Kentucky should be 73.2 percent according to the 1962 County and City Data Book. The median property value in Milam County, Texas should be $5,400.

Matching counties over time is imperfect due to occasional mergers and changes in boundaries. Partial county entries for Yellowstone National Park are dropped from the analysis, as are counties/territories in Hawaii and Alaska. Excluding counties with reported changes of more than 5 square miles does not change the qualitative results from tables 3 and 4. The coefficient in panel A, column 3 (refrigerators, 1940-50) increases in magnitude from -0.101 (s.e.=0.094) to -0.121 (s.e.=0.091); the coefficient in panel B, column 3 (stoves 1940-1960) falls in magnitude from -0.088 (s.e.=0.049) to -0.076 (s.e.=0.051). The coefficient change for electric lighting (1940-50) in table 4 is from -0.182 to -0.187 (s.e.=0.054 in both cases).

In 1960, approximately 15 percent of counties have a bottom code for median property values of $5,000 in the census data. The results in the text are not sensitive to resetting these observations to $3,750 (75% of 5,000). In table 2, panel C, column 3, the coefficient on washing machines falls from 0.068 to 0.057 (s.e.=0.069 in both cases); the coefficient on modern stoves falls from -0.309 (s.e.=0.113) to -0.327 (s.e.=0.116). In table 3, panel B, column 3, the coefficient on modern stoves (1940-60) falls from -0.088 to -0.093 (s.e. = 0.50 in both cases); in panel C, column 3, the coefficient on modern stoves (1950-60) increases from -0.044 to -0.043 (s.e. = 0.053 in both cases).

State-level, annual electricity data

The numerator for the "mean exposure to electricity" variable is constructed from the Edison Electrical Institute (EEI) publication, *Statistical Bulletin*. The *Bulletin* provides annual state-level reports of the number of residential electrical customers from 1925 to 1960. In the EEI data, Maryland and Washington DC customers are always counted together. North Carolina and South Carolina customers are often counted together, and for consistency we used these larger units of aggregation for all years.

To calculate the denominator, we used the housing unit counts from the census, which we interpolated between dates with constant growth rates. Then, we divided the EEI customer counts by the Census of Housing counts of families (in 1920 and 1930) or occupied dwelling units (in 1940, 1950, and 1960) in each state to estimate the proportion of families with electrical service. The figures for the denominator are consistent with the housing unit counts in *Historical Statistics of the United States* (Carter et al., 2006). Kenneth Snowden discusses the comparability of housing count data across census years in Volume 4 of *Historical Statistics* (4-500 and 4-501): "Before 1940 the census enumerated "families" and not housing unit… However, the two concepts are closely related: a census family was defined in 1930 as a single person living alone, a small group of unrelated persons sharing living accommodations, or, more normally, a group of related persons who live together as one household. Despite differences in terminology, therefore, the basic notion of a family, dwelling unit, or housing unit has provided essentially comparable measures of the residential housing stock since 1890."

On occasion, the ratio of residential customers from EEI to housing units from the Census slightly exceeds unity (in approximately 10 percent of state-year cells from 1925 to 1960). Nearly all such cases (84 percent) occur between 1950 and 1960 when the true rate of electrification is likely to be close to 100 percent for some states. We have left these values in place rather than making *ad hoc* adjustments to the underlying data.

Amish data

The Amish fertility series presented in the text combine information from several different IPUMS samples to maximize sample size. This combined sample includes the 1940 1% sample; pooled 1980 5%, 1%, 1% Detailed Metro/Nonmetro, 1% Urban/Rural, and 1% Labor Market Areas samples; and pooled 1990 5%, 1% Metro, 3% Elderly and 0.5% Labor Market Areas samples of the U.S. decennial census (Ruggles et al. 2009). For comparison groups we select non-Pennsylvania Dutch speaking respondents from farms in Pennsylvania, Ohio, and Indiana (the main settlement areas of the Amish) and a set of non-farm households from throughout the US (to show the general population's baby boom). As described in the main text, we check the robustness of trends by excluding respondents with telephones in the 1980 and 1990 censuses and also excluding Pennsylvania Dutch speakers residing in Pennsylvania. Appendix table 2.1 reports the estimates and sample sizes underlying figure 7.

The main criterion for selection into the sample of potential Amish respondents is whether Pennsylvania Dutch is the respondent's primary language spoken at home (1980 and 1990) or "mother tongue" (1940 census). There is a close link between Amish-status and the use of Pennsylvania Dutch (also known as Pennsylvania German) as one's primary language. This claim is based upon several external sources.

i. We contacted a contributor to the linguistics literature on the Pennsylvania German language, Karen Johnson-Weiner, a Professor of Anthropology at SUNY-Potsdam. She confirmed that the overwhelming majority of Pennsylvania German speakers, the term used by linguists to refer to Pennsylvania Dutch speakers, are Old Order Amish or from smaller groups of conservative "horse-and-buggy" Old Order Mennonites [specifically the Stauffer and Wenger Mennonite groups]. The most easily and widely accessible source of reliable information on the Amish is Elizabethtown College's Amish Studies website, which is supported by the Young Center for Anabaptist and Pietist Studies. As of May 2010, the website notes that "Regardless of where they live, the Amish speak the Pennsylvania German dialect (popularly known as Pennsylvania Dutch), except in a few communities where they speak a Swiss Dialect" (http://www2.etown.edu/amishstudies/FAQ.asp). It also notes that "Although the Amish originally comprised only a small minority of the Pennsylvania German-speaking population [in the 1700s], they and the Old Order Mennonites are the last groups to use the language actively and pass it on to their children" (http://www2.etown.edu/amishstudies/Language.asp). Our reading suggests that when scholars attempt to estimate the number of Pennsylvania Dutch speakers in the world, they start by estimating the number of Old Order Amish; other groups are comparatively small. In sum, there is no controversy in the claim that Pennsylvania Dutch is the primary language of the Amish, and that the Amish comprise the vast majority of speakers of Pennsylvania Dutch.

ii. We also undertook additional reading of the linguistics literature on Pennsylvania German. Huffines (1980) notes: "Pennsylvania German is the main language used within plain families and communities, the language which is passed on to children as their mother tongue" and "The use of Pennsylvania German among non-plain Pennsylvania Germans is diminishing rapidly. Most of the non-plain Pennsylvania Germans learn Pennsylvania German as a second language if they learn it at all" (p. 352).[4] Moelleken notes, "From all accounts the cluster speakers have already assumed the dominant role in the Pennsylvania German-speaking landscape and will, in all likelihood, all but displace the other groups in a few years" (1988, p. 107).[5] Overall, our reading suggests a rapid decline in the use of Pennsylvania German among non-Amish residents of Pennsylvania starting in the early 1900s at the latest. Like many other ethnic groups in the early 1900s, non-Amish adult speakers of Pennsylvania Dutch stopped speaking and teaching the language to their children (who attended English-speaking schools) because of perceptions about the importance of learning and using English. This may have been heightened by anti-German sentiment associated with World War I and II. Daily and primary use of the language has all but died in non-Amish communities, and even among those non-Amish who have rudimentary

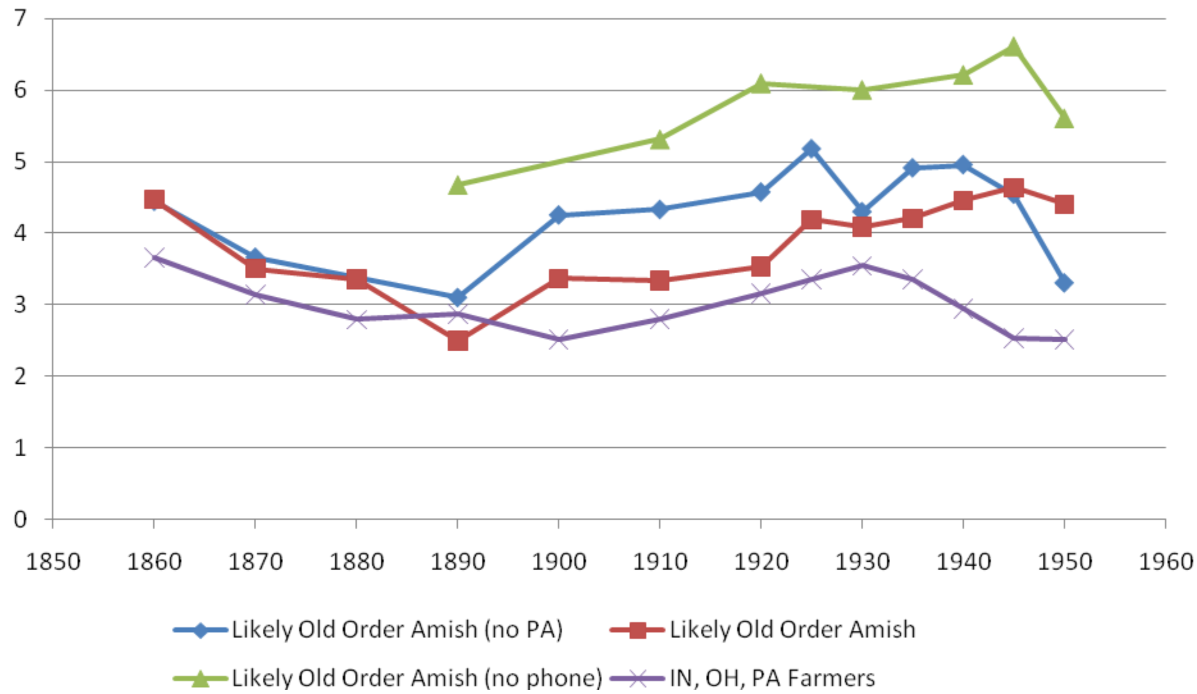
[4] In this context, "plain" families are members of conservative, Old Order sects of Amish and Mennonites.
[5] "Cluster speakers" of Pennsylvania Dutch are those apart from mainstream society due to their religious beliefs. The Amish are the largest such group.

knowledge of the Pennsylvania Dutch language, nearly all view English as their first language.

We find the information above to be helpful in confirming our interpretation of the Pennsylvania Dutch language variable as a strong correlate of Old Order Amish religion, but we have pursued an additional robustness check: Suppose that non-Amish Pennsylvania Dutch speakers contaminate our sample. To the extent that non-Amish Pennsylvania Dutch speakers are in our sample, nearly all should reside in Pennsylvania. Therefore, we constructed an IPUMS-based series that *excludes everyone from Pennsylvania*. Appendix figure 2.1 shows that this restriction does not change our conclusions. This robustness check squares nicely with other checks reported in the paper.

Finally, it is worth noting that our work with the IPUMS data offers confirmation of facts that were originally generated in a completely independent literature on the demographic history of Amish—a literature that uses genealogical records in which there is no ambiguity about Amish status. This literature is discussed and cited in section III of the paper.

Appendix Figure 2.1. Baby Boom among Pennsylvania Dutch Speakers Outside of Pennsylvania



Appendix Table 2.1. Summary Statistics for the Likely Old Order Amish Sample

Birth Cohort	Likely Amish	Likely Amish (no phones)	Farm residents in IN, OH, PA	Non-farm U.S. residents
1860	3.96		3.66	3.38
	(0.513)		(0.236)	(0.038)
	[23]		[141]	[6,204]
1870	2.686		3.14	2.89
	(0.490)		(0.143)	(0.025)
	[35]		[331]	[12,410]
1880	3.121		2.79	2.42
	(0.464)		(0.12)	(0.019)
	[33]		[471]	[15,878]
1890	2.721	4.680*	2.88	2.39
	(0.261)	(0.554)	(0.093)	(0.007)
	[104]	[50]	[704]	[120,368]
1900	3.072		2.52	2.25
	(0.141)		(0.054)	(0.003)
	[426]		[1,622]	[536,506]
1910	3.238	5.314	2.80	2.38
	(0.107)	(0.385)	(0.038)	(0.002)
	[769]	[105]	[3,186]	[1,078,488]
1920	3.458	6.098*	3.16	2.71
	(0.169)	(0.36)	(0.045)	(0.003)
	[365]	[132]	[2,292]	[686,069]
1925	4.013		3.36	2.96
	(0.167)		(0.044)	(0.003)
	[377]		[2,451]	[707,994]
1930	3.308	6.005*	3.55	3.12
	(0.189)	(0.281)	(0.044)	(0.003)
	[318]	[187]	[2,376]	[671,161]
1935	4.363		3.36	2.98
	(0.192)		(0.04)	(0.002)
	[300]		[2,314]	[683,298]
1940	4.542	6.216	2.95	2.54
	(0.188)	(0.324)	(0.037)	(0.002)
	[332]	[139]	[2,381]	[815,073]
1945	4.419	6.614	2.53	2.16
	(0.240)	(0.435)	(0.046)	(0.002)
	[210]	[70]	[1,303]	[591,659]
1950	4.283	5.609	2.52	1.93
	(0.229)	(0.361)	(0.055)	(0.002)
	[205]	[92]	[1,067]	[585,480]
Total	3.757	5.888	3.033	2.567
	(0.054)	(0.139)	(0.015)	(0.001)
	[3,497]	[775]	[20,639]	[6,510,588]

Notes: The table entries are the mean number of children ever born, the standard error of the mean in parenthesis, and the number of observations in brackets. Birth cohorts are grouped into five or ten-year categories to maintain informative samples sizes. *The cohort labeled 1890-99 for the likely Old Amish (no phones) corresponds to the 1890 to 1909 cohort. The younger cohorts of the likely Amish (no phones) are grouped into ten year cohorts, so the cohorts labeled 1920-24 and 1930-34 correspond to the ten-year groupings 1920-29 and 1930-39, respectively. For sample definitions and source information, see text and figure 7 notes.

Appendix 3. Additional Results

This appendix reports additional results from regressions of county-level fertility rates on appliance ownership and electrification.

Median regressions

Footnote 8 of the paper reports that median regressions yield results that are similar to those from the paper's OLS regression specifications, which are reported in tables 2, 3, and 4. For comparison, the median regression results are reported in appendix tables 3.1, 3.2, and 3.3 presented below.

Instrumental variable regressions

Because access to the electrical service is related to the use of modern appliances, it is a potential instrumental variable for appliance ownership. At the request of a referee, we ran regressions of fertility on appliances (refrigerators or modern stoves), using electricity in 1940 and 1950 as an instrumental variable. This yields uniformly negative coefficients on appliance diffusion. Results are reported in appendix table 3.4 below. Standard errors are adjusted for clustering at the state level and reported in square brackets. F-statistics on the excluded instrument from the first-stage regression are reported in curved brackets. In some cases the IV results are close to the OLS results in tables 2 and 3 of the paper, but in other cases the IV results are much larger in magnitude (i.e., much more negative). We are not fully convinced that this is a valid IV strategy because it is hard to rule out the possibility that electrification had a direct effect on fertility through its effect on the local economy.

Additional control variables

To address concerns about cross-county differences in the distribution of income across families, we have re-run the paper's county-level regressions with additional control variables that measure the proportions of families with "low" and "high" income. The 1950 census reports the proportion of families with income under $2,000 and proportion of families with income above $5,000 in each county. The 1960 census reports the proportion of families below $3,000 and the proportion above $10,000. Regression results are reported in appendix table 3.5 for both the original specification (as in the paper) and the expanded specification (with low and high income). Adding these variables has a negligible effect on the results. There is not comparable information for the 1940 census, which did not ascertain family income or its distribution.

Appendix Table 3.1. Quantile Regressions of Fertility on Appliances in U.S. Counties, Cross-Sectional Specifications, 1940-1960

	Dependent Variable: General Fertility Rate		
	(1)	(2)	(3)
Panel A: 1940			
Percent with refrigerator	-0.702	-0.667	0.021
	[0.024]	[0.022]	[0.032]
	{0.020}	{0.023}	{0.038}
Observations	3034	3034	3034
Pseudo R-squared	0.21	0.32	0.42
Percent with modern stove	-0.414	-0.393	0.026
	[0.014]	[0.013]	[0.024]
	{0.011}	{0.013}	{0.024}
Observations	3034	3034	3034
Pseudo R-squared	0.18	0.31	0.42
Panel B: 1950			
Percent with refrigerator	-0.407	-0.490	-0.383
	[0.020]	[0.030]	[0.031]
	{0.019}	{0.025}	{0.046}
Observations	3031	3031	3031
Pseudo R-squared	0.07	0.24	0.31
Percent with modern stove	-0.180	-0.256	0.004
	[0.016]	[0.017]	[0.030]
	{0.015}	{0.020}	{0.031}
Observations	3031	3031	3031
Pseudo R-squared	0.03	0.21	0.30
Panel C: 1960			
Percent with washing machine	-0.067	-0.191	0.075
	[0.033]	[0.038]	[0.048]
	{0.049}	{0.069}	{0.056}
Observations	3022	3022	3022
Pseudo R-squared	0.001	0.17	0.28
Percent with modern stove	-0.148	-0.391	-0.263
	[0.030]	[0.035]	[0.036]
	{0.043}	{0.046}	{0.046}
Observations	3022	3022	3022
Pseudo R-squared	0.004	0.19	0.28
State fixed effects	No	Yes	Yes
Economic and demographic controls	No	No	Yes

Notes: Each point estimate is from a separate median regression corresponding to equation 1 (cross-sectional specification). Stata's default method for calculating standard errors is based on Koenker and Bassett (1992) and Rogers (1993); these are reported in square brackets. Bootstrapped standard errors (1,000 repetitions) are reported in curved brackets; the method is based on Gould (1992, 1997). The dependent variable is the number of infants (under 1 year) per thousand women ages 15 to 44. A "modern stove" is defined to use electricity or gas (not wood, coal, or kerosene). The unit of observation is a county. The covariates in column 3 include the urban proportion of the county's population, log population density, nonwhite proportion of the county's population, proportion of employment in agriculture and manufacturing (separately), median years of schooling for those over age 24, log of median property value, and the proportion of women in the labor force. The 1950 and 1960 specifications also control for log median family income (this variable is unavailable in 1940). The urban variable generally measures the proportion of the population residing in incorporated places with more than 2,500 residents. The density measure is the log of residents per square mile. Nonwhite includes black and "other" racial categories. The proportion of workers employed in agricultural and manufacturing industries are expressed relative to total employment. The percent of women in the labor force is the ratio of all women in the labor force divided by the number of women over age 14. The median schooling variable in the 1940 table is for women, whereas in 1950 and 1960 it is for both men and women. Observations with missing values for any economic or demographic control variable are dropped to maintain a consistent sample across specifications.

Sources: Data for refrigerators, washing machines, and covariates are from Haines (2004). Data on the type of cooking fuel, which are used to define "modern stoves," were entered from the published Census of Housing volumes (U.S. Department of Commerce 1943, 1953, 1963).

Appendix Table 3.2. Quantile Regressions of Fertility on Appliances in U.S. Counties, Difference Specifications, 1940-1960

	Dependent Variable: Change in General Fertility Rate		
	(1)	(2)	(3)
Panel A: Refrigerators 1940-50			
Δ Percent with refrigerator	-0.042	-0.242	-0.055
	[0.032]	[0.041]	[0.032]
	{0.035}	{0.038}	{0.042}
Observations	3023	3023	3023
Pseudo R-squared	0.00	0.12	0.18
Panel B: Modern stoves, 1940-60			
Δ Percent with modern stove	-0.265	-0.333	-0.091
	[0.021]	[0.020]	[0.029]
	{0.021}	{0.023}	{0.027}
Observations	2990	2990	2990
Pseudo R-squared	0.04	0.18	0.26
Panel C: Modern stoves, 1950-60			
Δ Percent with modern stove	-0.236	-0.216	-0.056
	[0.020]	[0.026]	[0.023]
	{0.020}	{0.027}	{0.033}
Observations	2990	2990	2990
Pseudo R-squared	0.03	0.11	0.15
State fixed effects	No	Yes	Yes
Economic and demographic controls	No	No	Yes

Notes: Each point estimate is from a separate median regression corresponding to equation 2 (difference specification). Stata's default method for calculating standard errors is based on Koenker and Bassett (1992) and Rogers (1993); these are reported in square brackets. Bootstrapped standard errors (1,000 repetitions) are reported in curved brackets; the method is based on Gould (1992, 1997). The dependent variable is the change in the number of infants (under 1 year) per thousand women ages 15 to 44 between two census years at the county-level. The covariates in column 3 include the change in urban proportion of the county's population, the change in log population density, the change in nonwhite proportion of the county's population, the change in proportion of employment in agriculture and manufacturing (separately), the change in median years of schooling for those over age 24, the change in log of median property value, and the change in the proportion of women in the labor force. Urban, density, nonwhite, employment and labor force variables are defined as in table 2's notes. In this table, for better comparability with the variables available in 1950 and 1960 (which include both men and women), the schooling variable in 1940 is the average of the median schooling values for men and women. When necessary, observations with missing values are dropped to maintain a consistent sample across specifications.

Sources: Data for refrigerators, washing machines, and covariates are from Haines (2004). Data on the type of cooking fuel were entered from the published census volumes in each year as described in the data appendix.

Appendix Table 3.3. Quantile Regressions of Period Fertility on Electrical Service, 1940-1950

	Dependent Variable: General Fertility Rate		
	(1)	(2)	(3)
Panel A: Fertility cross section, 1940			
Percent with electric lights	-0.419	-0.529	-0.174
	[0.011]	[0.013]	[0.029]
	{0.011}	{0.015}	{0.032}
Observations	3034	3034	3034
Pseudo R-squared	0.21	0.36	0.42
Panel B: Fertility cross section, 1950			
Percent with electric lights	-0.518	-0.565	-0.360
	[0.028]	[0.022]	[0.041]
	{0.038}	{0.028}	{0.055}
Observations	3031	3031	3031
Pseudo R-squared	0.07	0.25	0.31
Panel C: Fertility change, 1940-1950			
Δ Percent with electric lights	-0.289	-0.351	-0.188
	[0.021]	[0.026]	[0.022]
	{0.018}	{0.024}	{0.036}
Observations	3023	3023	3023
Pseudo R-squared	0.05	0.15	0.18
State fixed effects	No	Yes	Yes
Economic and demographic controls	No	No	Yes

Notes and sources: See appendix table 3.1. We compiled the data for electric lights in 1950 from the published volumes of the Census of Housing (U.S. Department of Commerce 1953); the 1940 electric light data are from Haines (2004).

Appendix Table 3.4. Using Electric Lights to IV for Appliance Ownership in 1940 and 1950

Panel A: Cross Section Regressions, Corresponding Specifications in Table 2	Table 2, Col. 1, OLS	Table 2, Col. 1, IV	Table 2, Col. 2, OLS	Table 2, Col. 2, IV	Table 2, Col. 3, OLS	Table 2, Col 3, IV
1940 Refrigerator	-0.689	-0.800	-0.665	-0.858	0.017	-0.414
	[0.056]	[0.060]	[0.067]	[0.071]	[0.050]	[0.162]
		{933.06}		{1161.29}		{58.03}
1940 Modern Stove	-0.428	-0.638	-0.410	-0.672	0.029	- 1.031
	[0.034]	[0.051]	[0.038]	[0.075]	[0.034]	[0.946]
		{258.11}		{219.11}		{1.85}
1950 Refrigerator	-0.402	-0.459	-0.483	-0.589	-0.401	-0.659
	[0.056]	[0.060]	[0.057]	[0.058]	[0.104]	[0.142]
		{1017.90}		{777.55}		{382.83}
1950 Modern Stove	-0.193	-0.397	-0.246	-0.519	0.004	-2.335
	[0.036]	[0.061]	[0.033]	[0.067]	[0.049]	[1.160]
		{378.25}		{211.49}		{5.48}

Panel B: Difference Regressions, Corresponding Specifications in Table 3	Table 3, Column 1, OLS	Table 3, Column 1, IV	Table 3, Column 2, OLS	Table 3, Column 2, IV	Table 3, Column 3, OLS	Table 3, Column 3, IV
Refrigerators 1940-1950	-0.007	-3.570	-0.214	-0.932	-0.101	-0.573
	[0.099]	[2.064]	[0.089]	[0.168]	[0.094]	[0.192]
		{3.30}		{99.77}		{62.73}
State fixed effects	No	No	Yes	Yes	Yes	Yes
Control variables	No	No	No	No	Yes	Yes

Notes: The table reports both OLS and IV regressions of fertility on appliance ownership, corresponding to tables 2 and 3 in the paper. Robust standard errors are clustered by state and reported in square brackets. In the IV columns, the first-stage regression's F-statistic on the excluded instrument (proportion of households with electrical lights) is reported in curved brackets. The 1960 census did not inquire about electric lights, so the IV approach cannot be attempted for that year.

Appendix Table 3.5. Regressions with Controls for Proportions of Families with "Low" and "High" Income, 1950 and 1960

	Original coefficients and standard errors from "column 3" of relevant table and panel	After adding controls for families with "low" and "high" income
Table 2, Panel B: 1950, Refrigerators	-0.401	-0.413
	(0.104)	(0.089)
Table 2, Panel B: 1950, Modern Stoves	0.004	-0.034
	(0.049)	(0.049)
Table 2, Panel C: 1960, Washing Machine	0.068	0.085
	(0.069)	(0.063)
Table 2, Panel C: 1960, Modern Stove	-0.309	-0.291
	(0.113)	(0.103)
Table 4, Panel B: 1950, Electric Lights	-0.375	-0.262
	(0.083)	(0.066)

Notes and sources: See tables 2 and 4 of the paper.

Additional References

Gould, William. 1992. “sg11.1: Quantile Regression with Bootstrapped Standard Errors.” *Stata Technical Bulletin* 9: 19-21.

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