Do Higher Rents Discourage Fertility? Evidence from U.S. Cities, 1940-2000*

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Abstract

This paper documents the existence of a negative cross-sectional correlation between the price of living space and fertility using U.S. Census data over the period 1940-2000. This correlation is not spurious, nor does it reflect the tendency of larger families to locate within less-expensive areas of a given metropolitan area. We examine the extent to which the results reflect the sorting of married couples across metropolitan areas on desired fertility. The relationship between the unit price of living space and fertility in fact tends to be more negative for households that have moved recently. However, the probability of migration between metropolitan areas is smaller for larger families, even those originating in more expensive cities. Moreover, Durbin-Wu-Hausman tests reveal only limited evidence of endogeneity. The weaker effects of the price of living space for less mobile couples seems to be at least in part a result of their choosing to live in less-expensive portions within a given metropolitan area.

> "Increased splendor, with higher prices for the necessaries of life, keep men from marrying in the cities." Johann Suessmilch, 1760 (in Adna F. Weber, 1899, p. 330).

1. Introduction

A good deal of research has examined the emergence of low fertility rates in Europe. Kohler et. al. (2002) investigates the emergence of what they call "lowest-low fertility" in Europe. Among other factors, they noted that the availability of housing was of particular concern, especially in Italy and Spain. Recent research by Giannelli and Monfardini (2003) found that the price of housing had an effect on household membership among Italian youths.

The importance of housing in the family economic decisions is not limited to Europe. Recently, Egan (2005) wrote in the *New York Times* that

> "Portland is one of the nation's top draws for the kind of educated, self-starting urbanites that midsize cities are competing to attract. But … [o]fficials say that the very things that attract people who revitalize a city - dense vertical housing, fashionable restaurants and shops and mass transit that makes a car unnecessary - are driving out children by making the neighborhoods too expensive for young families."

To take another example, San Francisco is legendary for the small fraction of children in its population, due at least in part to its high cost of housing, with a median price of about $700 thousand (Gonazales 2005).

This paper examines the relationship between fertility and the price of living space across metropolitan areas. A growing literature, much of it focused on developing countries, has found just such a relationship. Although researchers have used U.S. data to examine the relationship between the price of living space and living arrangements (Hughes 2003; Borsch-Supan 1986; Haurin et. al. 1993), there is, to our knowledge no work on fertility per se.

This paper examines the relationship between fertility and the scarcity of living space across U.S. metropolitan areas over the period 1940-2000 using data from the Integrated Public Use Microdata Samples (IPUMS) and the 1985-96 American Housing Surveys (AHS). To foreshadow our findings, we document a statistically significant negative cross-sectional relationship between the price of living space and fertility. This relationship does not arise as an artifact of our measure of the price of living space – rent per room – or merely due to the effects of timing.

We recognize that fertility choice and geographic location are potentially simultaneous, with couples who desire larger families being able to move to less expensive neighborhoods within a metropolitan area, or, indeed, to less expensive metropolitan areas. We try to reduce the potential for simultaneity of fertility and within-metro location choice by measuring the scarcity of living space at the level of the Consolidated Metropolitan Statistical Area (CMSA), the most inclusive metropolitan unit of observation available. We also examine the potential for simultaneity between fertility choice and choice of CMSA, both by exploiting information in the IPUMS on mobility 5 years prior to the Census, as well as by testing for endogeneity of the price of living space in our fertility models. In practice, there was modest evidence of endogeneity bias for the 1960 and 1970 Census years, but not for the other years.

The paper is organized as follows. Section 2 motivates the paper with some cross-country data and briefly reviews the literature. Section 3 outlines a simple model.[2] Section 4 is devoted to a discussion of the various sources of data and Section 5 to our empirical strategy. An overview of the data is provided in Section 6. Section 7 focuses on the demand for living space. The basic fertility results are presented in Section 8. Section 9 investigates whether the estimates in Section 8 might be explained by timing effects (delayed marriage and fertility). Section 10 examines the potential role of selective migration. Section 11 presents additional endogeneity diagnostics and IV estimates. Section 12 concludes with some implications of our findings and suggestions for future research.

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[2] Our (2007) working paper presents a formal model.

2. Motivation and Literature

To our knowledge our paper is the first to examine the relationship between fertility and the scarcity of living space using U.S. Census micro data. However, our paper is related to work in a number of areas. A good deal of work has analyzed the link between the scarcity of land and fertility in rural populations, as well as the impact of urbanization on fertility. Relatively few studies focus on the relationship between the scarcity of living space and fertility in an urban setting, and those that we have found are relatively early and use data on single cities.[3]

Economists have long theorized that the demand for children is inversely related to the availability of land. Alfred Marshall (1920), for example, professed that there existed "no conditions more favourable to the rapid growth of numbers than those of the agricultural districts of new countries," where, in addition to other advantages, "land is to be had in abundance" (p. 152). By contrast, urbanization should temper fertility, for in the towns "the gradual rise in the value of land" would tend to "check the increase of population."[4] Early empirical studies of the question include F.S. Crum (1897) and Adna F. Weber (1899). More recently, Lindert (1978) hypothesized that "an extra urban child, relative to the urban alternatives to that child, is definitely more expensive in the city, where (a) real wages are higher, (b) food is more expensive relative to luxuries, and (c) land-intensive, child-oriented living space is more expensive" (p. 133)."

Lindert (1978) and Easterlin and Crimmins (1985) were skeptical that higher rents would discourage fertility because parents of larger families can substitute towards lower-quality

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[3] Kitagawa and Hauser (1967) studied the city of Chicago. Heeren and Moors (1969) found housing pressures to be an important determinant of desired fertility in their study of young couples in Utrecht, The Netherlands. Felsen and Solaún (1975), using data from a "natural" experiment in Bogota, Columbia, found that couples living in apartments were less likely to have children than couples living in houses.

[4] Marshall was referring to "districts in which the system of peasant properties prevails, in which there is not much enterprise for opening out new trades or for emigration, and parents feel that the social position of their children will depend on the amount of their land" (p. 152).

housing.[5] Rather, they have emphasized the role of tastes, particularly when it comes to explaining the urban-rural fertility differential.[6] Although our study is focused on fertility differentials across urban areas and not on the urban-rural fertility differential, variations in tastes may still be important.

Our paper is closely related to a number of studies of living arrangements using data on U.S. metropolitan areas. For example, Borsch-Supan (1986) used data on three metropolitan areas from the 1976-77 Annual Housing Surveys to show that household formation was strongly negatively related to housing prices. Similar conclusions were reached by Haurin et. al. (1993), who examined data from the National Longitudinal Survey of Youth, and by Ermisch (1999), who examined data from the British Household Panel Survey. Gianelli and Monfardini (2003) examined data on household formation among Italian youths, and found, too, that the price of housing was an important determinant.

Perhaps closest in spirit and to our methodology is Hughes (2003), who used 1990 PUMS data to analyze the impact of rents on domestic living arrangements at the Metropolitan Area level. She categorized households as either married, cohabiting, living alone, living with roommates, or living with parents, and measured the unit price of housing as the average rent, including utilities, of a one-bedroom, three-room apartment within each Metropolitan Area, derived from the housing information on Census records. Multinomial logistic regressions revealed that higher housing costs were associated with greater likelihoods of living alone, with roommates, or with parents compared to being married.

We believe that Kohler et. al. (2002) are the first to suggest that the scarcity of living space might account for falling fertility in Europe. Unfortunately, systematic data on the price of living space in Europe do not appear to be publicly available. Indeed, this is one reason why our

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[5] "Extra children presumably raise the demand for rooms, floor space, and lot acreage…" (p. 125). However, because housing is not homogeneous, a rise in house rents in general need not raise the relative cost of a child, since extra children "reduce the demand for housing value per room or per acre" (p. 125).

[6] According to Lindert (1978), it is necessary "to explain why their tastes (or personal productivities) are more biased toward high-input children" (p. 133). See, too, Easterlin and Crimmins (1985, esp. p. 23).

paper focuses on the U.S. experience. However, to explore in a preliminary way the relationship between fertility and the scarcity of living space, we collected data on fertility and urban population density – intended as a proxy for the scarcity of living space -- for European countries, Canada, and the United States.[7] These data are graphed in **Figure 1**. As can be seen, there is a strong negative correlation between fertility and population density across European and North American countries. Needless to say, these data are only suggestive. They do, however, suggest that further investigation might be warranted.

3. Equilibrium Fertility Differentials

Sato (2006) develops a formal model of equilibrium fertility differentials in which larger city sizes give rise to agglomeration economies, which in turn generate positive income effects and negative substitution effects on fertility. Sato's (2006) model does not include land prices explicitly. Rather, larger city size is accompanied by greater congestion, which reduces the demand for children. In equilibrium, larger cities experience net in-migration, have higher wages, higher land prices, and lower fertility. [8] Of course, differences in the price of living space can arise for reasons other than congestion, such as restrictive zoning and other land use regulations, as in Glaeser, Gyourko, and Saks (2005), as well as consumption amenities and economies of agglomeration in production (Roback 1982).

The higher wages in larger, more expensive cities could induce women to substitute away from household activities and toward market work, and possibly away from child quantity and toward child quality as in Sato (2004). Alternatively, larger cities may offer better labor market opportunities, and hence be particularly attractive to women who are more career oriented, and who have lower demands for children. The empirical work below attempts to control for this source of potential bias.

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[7] The fertility data were taken from the CIA Factbook (2004) and the data on population density were computed from data taken from the Demographia website. The population density data originated as city-level densities. The population densities were then averaged by country (weighted by city populations).
[8]Evidence on the relationship between wages and population density can be found in (Clark et. al. 1988).

4. Data

4.1. IPUMS Census Data

We constructed a comprehensive sample of married, spouse-present U.S. metropolitan households using data from the 1940-2000 Integrated Public Use Microdata Surveys (IPUMS). IPUMS data contain two measures of fertility. The first measure, available for all years, is the number of children currently living in the household (NCHILD). The second, available only through 1990, is children ever born (CHBORN).[9] We therefore concentrate on number of children currently in the household, focusing in particular on younger couples (wives) in order to reduce the possibility that children have moved out of the household. Our results do, however, generally extend to older households, for whom we present a limited subset of findings.

A number of factors limited our analysis. The 1940 and 1950 censuses identify a relatively small number of metropolitan areas and collected detailed information for only a subset of households called "sample line records," thus limiting the number of cells and sample size in those years. The 1950 Census collected data on only one sample-line person per household, so that detailed information on the husband is not available. The finest level of geographic detail for the 1960 Census year is the state. Rather than drop 1960 entirely, we measure rent per room and the other aggregate variables at the state level. We used data only on urban households from the 1960 IPUMS, and the Metro samples from the 1970, 1980, and 1990 IPUMS. The 1970 sample (also known as County Group sample) only identifies areas of 250,000 or more, and the 1980 census only identified migration status for 50 percent of the households. We used the unweighted sample for 2000, which identifies a larger number of CMSAs than the weighted sample.

4.2. Measuring the Scarcity of Living Space

The IPUMS Census data contain information on the scarcity of living space in the form of measures of rent or, for owners, the value of the dwelling. However, variation across

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[9] We excluded households reporting more than 15 births.

households in rent or house value reflects at least in part variation across locations within a metropolitan area (e.g., central city versus outer suburbs). If, for example, larger families tend to locate in less expensive areas within a city, estimates of the effect of the scarcity of living space on fertility, if not corrected for simultaneity bias, will be overstated.

We therefore define the price of living space over a region sufficiently large that it does not reflect location decisions within a city (e.g., between central city and suburb): the Consolidated Metropolitan Statistical Area (CMSA), Metropolitan Statistical Area (MSA), or New England County Metropolitan Area (NECMA), whichever was largest, according to Census 2000 definitions. For simplicity, we refer to our geographic unit of analysis as the CMSA. [10] Variables measured at the CMSA level, by construction, should not be affected by the residential (self-) selection of households between neighborhoods or cities within a CMSA.[11]

Our primary measure of the scarcity of living space is *CMSA RENT/ROOM*, which is calculated as median (gross) rent in the CMSA divided by either the median or average number of rooms. This variable is a population-weighted average of the original county-level data. Although *CMSA RENT/ROOM* reflects average prices of only renters, it is highly correlated in the cross section with (owners') housing value per room, and has the advantage of being less contaminated by errors in judgment on the part of Census households regarding the value of their homes (Glaeser and Gyourko, 2005, p. 370).[12]

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[10]To be precise, the aggregate unit of analysis is the set of counties that comprise the CMSA as of 2000. The resulting metropolitan areas are quite inclusive. For example, the New York City CMSA includes Nassau and Suffolk counties in New York, Bergen-Passaic, Middlesex and Somerset counties in New Jersey. New England NECMAs are similarly inclusive: the Boston CMSA includes the cities of Worcestor, Lawrence, Haverhill, Lowell, and Salem-Gloucestor counties, and includes regions in New Hampshire, Maine, and Connecticut.

[11] It is common to reduce simultaneity bias by using a less fine level of aggregation for the explanatory variable than for the dependent variable (e.g., Guryan, 2004). For example, in their study of urban social interaction, Brueckner and Largey (2007) used metropolitan-wide population density as an instrument for census-tract density. The key identifying assumption is that although "people may self-select across tracts in endogenous fashion, choice of a metro area (and hence a level of aggregate density) is unrelated to unobservable characteristics affecting social interaction." The same logic underlies our use of CMSA-wide rents to measure the price of living space.

[12] We also constructed a price variable using information from the Census household record, *OWN RENT/ROOM*, equal to monthly contract rent divided by the number of rooms in the dwelling (or, for

4.3. An Alternative Price Measure from American Housing Survey Data

If larger families tend to live in houses with square footage similar to that of smaller houses occupied by smaller families, but more rooms, a spurious negative correlation between fertility and real rent per room might arise. Unfortunately, IPUMS data do not report the square footage of the dwelling.[13] Although we cannot circumvent the problem entirely, we used data from the metropolitan samples of the 1988-93 American Housing Surveys (AHS), available for 44 SMSAs on a rotating basis (see Appendix A), to construct two measures of housing cost per square foot, which we were able to match up to 36 CMSAs in our IPUMS samples. The first measure is mean housing cost per square foot (ZSMHC/UNITSF).[14] Monthly housing cost includes basic utilities and insurance payments in addition to rent or mortgage payment. The second is *CMSA RENT/FT*^{2}, which was constructed by dividing *CMSA RENT/ROOM* by mean square foot per room as computed from the American Housing Survey. In addition to using these variables to estimate fertility regressions using IPUMS data, we also estimated fertility regressions using data from the pooled American Housing Surveys. Although statistical significance is often modest in light of the limited number of CMSAs, the results suggest that the relationships we estimate using *CMSA RENT/ROOM* are not merely spurious.

5. Empirical Strategy

5.1. Specification

Our goal is to obtain, in the words of Hotz et. al. (1997), "unbiased (or consistent) estimates of the 'reduced-form' effects of 'exogenous' changes in various prices which are related to children and their production and in household income on the number of children

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owners, imputed based on the value of their dwelling). The results were similar to those obtained using CMSA-level information, but introduced the problem of correcting for dwelling characteristics and exacerbated the issue of simultaneity.

[13] We are not the first researchers to face this difficulty. See, for example, Margo 1996.

[14] Following Glaeser and Gyourko (2005), we tried imputing square footage by regressing square footage on a host of housing characteristics common to both AHS and IPUMS. The imputations were too noisy to be useful, the R-Squares ranging between 0.35 and 0.40, and the errors in measurement driving the estimated coefficients on the price variable toward zero.

demanded (and borne) by parents over their lifetimes" (p. 322).[15] We use a reduced form because our purpose is not to estimate the income and substitution effects of husband's and wife's wages, but rather to control for their determinants.[16]

The use of a reduced form potentially introduces timing bias: that is, couples in more densely populated CMSAs could simply delay fertility until later in life. We assess the importance of timing in a number of ways. First, we estimate the effects of the scarcity of living space on age at first marriage and age at first birth. If the estimated effects are relatively small, one can be more confident that the estimated effects of the scarcity of living space on fertility do not merely reflect delay. Also, as noted earlier, we have information on cumulative lifetime fertility for older households (in which the wife is 41 years of age or older and for whom fertility is presumably complete) for the years 1940 through 1990.

5.2. Simultaneity Bias

Hotz et. al. (1997, pp. 325ff) pointed out that exploiting data from multiple markets to identify the effects of various components of price on the demand for children can result in simultaneity bias.[17] In addition, many variables that typically enter the demand function – for example, wage rates and income – are endogenous.[18] T. Paul Schultz (1997) suggested that the researcher specify a parsimonious set of variables in order to avoid simultaneity bias (p. 384).

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[15]Authors who use the reduced form approach include Naz et. al. (2002).

[16]Structural estimation would introduce numerous complications, including how to interpret cross-sectional results in a life-cycle context. As is the case with labor supply, current-period choices are a function of all current and future prices. Regressions of current-period fertility on current-period wage rates are misspecified and hence lack economic meaning (Hotz et. al. 1997, p. 335). Structural estimation also requires accounting for the simultaneity between fertility and wages (T. Paul Schultz 1997, especially pp. 367 and 380), particularly if market participation affects human capital accumulation (Hotz et. al. p. 324).

[17] Hotz et. al. (1997) considered the problem of estimating the effect of child care costs on fertility. If such services are not perfectly elastically supplied, regions with high tastes for children will have higher fertility, lower rates of female labor force participation, and higher prices for female labor, thus raising the cost of child care services. Not all sources of bias operate in our favor. For example, regions with higher fertility demand could have higher demands for living space and hence higher rents, thus inducing a positive correlation between fertility and the unit price of space.

[18]Some have suggested correcting our price variable for "affordability" by dividing it by some measure of household income. The simultaneity between fertility and income, however, complicates matters. At any rate, our regressions control for the "exogenous" determinants of income.

Such parsimony, although desirable on econometric grounds, runs other risks. Couples may sort on unobserved demands for child quantity and quality. For example, Hotz et. al. (1997) suggested that better – read, more expensive -- neighborhoods might reduce the shadow price of child quality, the effect of which would be to *increase* the shadow price of child *quantity*, thus reducing fertility. Alternatively, more expensive, more densely populated regions may offer amenities that substitute for child quantity, and hence may attract couples with tastes for fewer, higher-quality offspring.

By construction, *CMSA RENT/ROOM* is uncorrelated with factors that generate sorting *within* a given CMSA. However, households might also sort *across* CMSAs on unobservables that are correlated both with fertility and the price of living space. We have tried to address the problem in two ways: (1) control variables; (2) accounting for selective migration.

We take as exogenous variables such as education and age of the husband and wife, race, and residence in each of the nine Census regions. We add to these variables others to control for the most likely sources of sorting in the fertility equations. Although these controls are likely to be endogenous, most of them should work against finding an effect of the price of living space on fertility.

We controlled for sorting on climate using 3 variables: heating degree days, cooling degree days, and average precipitation. To capture (sorting on the) underlying variation in demand for child (school) quality, all regressions control for the percentage of individuals in the CMSA with a college degree or better.[19] To control for sorting on income, all regressions control for log median family income in the CMSA. We controlled for the demand for urban amenities, we included a dummy variable for residence inside a central city.[20] Finally, because more

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[19] Haurin and Brasington (1996), among others, find school quality to be an important determinant of property values. We tried including state-level measures of school quality, which entered inconsistently and with little consequence, and hence were not included here to reduce clutter.

[20] We also tried Richard Florida's (2002) Bohemian Index, a measure of the presence of so-called "creative capital" in the city. The variable was available for most, but not all of the cities in the IPUMS samples, and entered with mixed sign and significance. We therefore dropped the variable from our analysis.

densely populated, more expensive cities appear to offer better labor market opportunities for working women, particularly highly educated women (see Costa and Kahn, 2000), all regressions control for wives' individual labor force participation at the time of the survey and, to capture lifetime labor force attachment, the female labor force participation rate in the CMSA.[21]

Selective Migration. Couples who have moved recently may be more likely to have strong preferences for or against children.[22] We assessed the importance of selective migration in a number of ways. First, we estimated the fertility equations separately for movers and stayers. Such an exercise is not definitive to the extent that parents have already self-selected across cities. Secondly, the IPUMS data contain information on geographic location 5 years prior to the Census. We examined whether larger families were more likely to move out of expensive cities, and whether having a large family was associated with movers choosing less expensive cities. We also estimated fertility regressions for movers as a function of the price of living space in their prior CMSA. If parents can forecast mobility as well as fertility, there is less reason to expect current fertility to be related to rents in the prior CMSA.

Instrumental Variables Estimation. We tested for the endogeneity of the price of living space using two basic classes of instruments: (1) variables measured at the state level in the current state of residence and (2) variables measured at the state level in the state of birth. The instruments included variables measuring educational attainment, climate, family income, female labor force participation, as well as state-level measures of rent per room (except for 1960, which

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[21]Another way to control for unobserved heterogeneity is to pool the data and include CMSA-level fixed effects. Fixed-effects estimates of the effect of the price of living space on fertility were of mixed sign and significance, depending on the period studied. Fixed effects estimates, which use solely within-CMSA variation in rent and fertility (and the other variables) may be contaminated by the fact that increases in rents imply increases in housing prices, which is a source of wealth. We leave this problem for future research.

[22]Suppose, for example, that the indirect utility of couple i in current region c is $U_{ic} = \alpha_i w_{ic} + \beta_i r_{ic} + u_{ic}$, where r_{ic} is the unit price of living space in city c and β_i is more negative for households that have greater preferences for children. A couple will move from c to a less expensive city c' provided that $-(u_{ic'} - u_{ic}) \leq \alpha_i (w_{ic'} - w_{ic}) + \beta_i (r_{ic'} - r_{ic}) - C$, where C is the fixed cost of moving. Couples with more negative values of β_i are more likely to move, other things the same.

data are already at the state level) and population density. The instruments also included CMSA-level measures of construction costs from R.S. Means (2005). As will be seen in Section 10, there was only modest evidence of endogeneity bias, and that, in these cases, IV estimates of the effects of the price of living space on fertility were usually statistically significant.

6. Data Overview

6.1. Fertility Differentials

Table 1 shows the mean number of children in the household for younger (wife age 40 or less), married, spouse-present households in the 40 largest CMSAs for the year 2000, sorted from low to high fertility. The table also shows *CMSA RENT/ROOM* for the same year. The lowest fertility of 1.32 is in the Raleigh-Durham MSA, and two other college towns – Greensboro-Winston-Salem and Austin-San Marcos – are among the bottom 4. San Francisco, with a fertility of 1.47, rounds out the bottom 5. The high end is dominated by cities with large concentrations of Hispanic households, including Los Angeles-Riverside-Orange County CA, Phoenix-Mesa AZ, Houston-Galveston-Brazoria, and San Antonio TX, but also includes Salt Lake City-Ogden UT. Although there is no clear relationship between mean children in the household and *CMSA RENT/ROOM* evident in these 40 cities, a simple bivariate plot of the relationship for the 237 CMSAs in the sample as a whole for that year reveals a negative relationship, seen in **Figure 2**.[23]

6.2. Summary Statistics

Summary statistics for younger couples in the IPUMS samples appear in **Part A** of **Table 2**. Number of children in the household rises from 1.45 children per young household in 1940 and 1.47 in 1950 to 2.03 in 1970, but falls to 1.62 in 1980 and 1.55 in 1990, rising slightly to 1.61 in the year 2000. As might be expected, average education levels rise over time. The proportion of black households rose from 7.4 percent in 1940 to 9.9 percent in 1970, but fell to 8.2 percent in

[23] The equation of the implied regression line is 1.71 – 0.00066 CMSA RENT/ROOM, with a standard error on the slope coefficient of 0.00037 and t-statistic of -1.77, which is significant at the 7.8% level. The robust t-statistic is slightly higher, at 2.25, which is significant at the 2.5% level.

1980 and 7.6 percent in 1990, rising slightly to 7.8 percent in 2000. The proportion of Hispanic households rose gradually over the period from 2.0 percent in 1940 to 17.5 percent in 2000. The geographic shift of the population to the South and West are evident in the regional dummies.

Part B of **Table 2** contains CMSA-level summary statistics.[24] We have deflated *CMSA RENT/ROOM* by a price index described in **Appendix B**. Percent college graduates is equal to the number of individuals age 25 and over with a college degree or better. Percent Catholic is defined as total Catholic adherents or members (whichever was available) divided by population; 1990 data were used for the year 2000, for which information on religious affiliation was unavailable. Real family income was defined as nominal family income divided by the CPI; 1950 income data were used for 1940, which explains the apparent drop between those two decades. Female labor force participation rose gradually from about 25 percent in 1940 to nearly 58 percent in the year 2000.

7. Evidence on the Demand for Living Space

A higher price of living space would be expected to affect fertility primarily through the demand for living space, which is presumably higher for couples with more children. We estimated equations for the demand for living space using data from both the IPUMS and the AHS. Living space is measured as the number of rooms (*ROOMS*) in the dwelling in the IPUMS, available starting with the year 1970, and as square footage (*UNITSF*) in the AHS. The evidence from AHS is particularly important because it is possible, at least in theory, that families with more children could choose to live in houses of the same square footage – and hence the same cost – as families with fewer children, but with more rooms, thus generating a potentially spurious negative correlation between fertility and rent per room.

We restricted the analysis to single-family households, with or without children, but the empirical estimates are robust to including other types of households. Although fertility is clearly

[24]We filled in missing county-level data on religious affiliation using CMSA-level averages.

endogenous, for the purposes of this descriptive exercise, we treat the number of children currently in the household as exogenous.[25] We included as control variables the unit price of living space, husband's and wife's age and education, wife's race, central city residence, and CMSA-level percent college grads, percent Catholic, and log family income.

The empirical findings are reported in **Table 3**. All standard errors are clustered on the CMSA. The estimates from IPUMS data, shown in columns (1)-(4), indicate that each additional child in the household is associated with about 0.3 additional rooms in the dwelling. The other variables enter as might be expected. For example, the number of rooms is negatively associated with the price of living space, is higher among older and better-educated couples, and is lower among couples who live in central cities. Even more importantly, the estimates from the AHS data, shown in column (5), indicate that dwelling space increases by about 75 square feet per child. This last finding means that a negative correlation between fertility and *CMSA RENT/ROOM* is unlikely to arise simply because larger families tend to occupy houses with smaller rooms but similar square footage (and hence similar housing expenditures).

8. Fertility Regressions

8.1. Basic Results

We specified the fertility of individual i in city c, f_{ic}, as a linear function of x_i, a vector of individual-level demographic and economic characteristics, and z_c, a vector of city-level characteristics:

$$f_{ic} = x'_i \beta + z'_c \gamma + \varepsilon_{ic} . \qquad (7)$$

where ε_{ic} is an error term.[26]

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[25]We are aware of the incongruity of treating fertility as exogenous. However, 2SLS estimation often resulted in implausibly large estimated effects of fertility on the demand for living space.

[26]OLS estimates were very close Poisson estimates. We also tried negative binomial, zero-inflated Poisson, and zero-inflated negative binomial specifications. The negative binomial distribution allows the mean to exceed the variance, but some researchers (Santos Silva and Covas, 2000, pp. 173-74) argue that fertility data are characterized by *under*-dispersion. Other researchers use hurdle models to distinguish between the

Table 4 contains OLS estimates of fertility, weighted by person weight (sample line weight in 1940 and 1950). Standard errors are clustered on CMSA throughout. Before turning to the coefficients of primary interest, it is useful to examine the effects of demographic characteristics. Fertility is increasing in wife's and husband's age, entered in the form of categorical dummy variables; the omitted category is 26 to 30-year olds. The estimated effects of wife's and husband's education were negative. Black households had lower fertility in 1940, but higher fertility thereafter. Hispanic households had higher fertility throughout, but the estimated coefficients display an interesting pattern, declining from about 0.5 for the years 1940-1960 to about 0.3 for 1970-1980, to 0.23 for 1990- 2000. Households with a foreign-born husband or wife were estimated to have slightly higher fertility in 1940, but lower fertility thereafter. Women who were participating in the labor market at the time of the survey tended to have fewer children, but the effect of participation declined from about -0.8 for 1940-1960 to -0.4 in 2000.

Couples living in central cities had fewer children, with an estimated effect of about -0.2 from 1940 through 1960, and about -0.1 from 1980 onward. The estimated effects of CMSA percent college graduates varied in sign and significance, while the estimated coefficients on CMSA log family income entered, with the exception of 1950 and 1970, with negative and statistically significant estimated coefficients. The climate variables were usually statistically significant, but in absence of a theory, we have little to say about their signs or magnitudes.

The estimated coefficients on *CMSA RENT/ROOM* were negative and statistically significant across all regressions starting with the 1950 Census year. The estimated coefficients ranged from -0.0011 (t =2.8) in 2000 to -0.0101 (t = 9.0) in 1970. To gauge the economic magnitude of the effects we calculated the effects of a standard deviation increase in *CMSA RENT/ROOM* for each year in **Table 2** on the number of births per 100 households. Excluding

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decision to have children at all and the parity decision, in which the probability of observing zero children is independent of the conditional mean. Our basic results are generally robust, but these alternative procedures are computationally more time-consuming and complex, and convergence was occasionally not achieved in the more complex procedures. OLS, in addition to being faster to compute, are more easily interpreted.

the insignificant estimate for 1940, the estimated effects ranged -3.1 in 2000 to -10.2 in 1970, with a median estimate of -4.2.

Figure 3 shows the partial regression plot of fertility on real rent per room for the year 2000.[27] Although there is considerable variation around the implied regression line, the results do not appear to be driven by outliers.

8.2. Per-Square-Foot Measures from the American Housing Survey

A negative correlation between fertility and *CMSA RENT/ROOM* could arise spuriously if larger families occupied houses and apartments with similar square footage (and hence, price) but smaller rooms. We used data from the metropolitan samples of the 1985-96 American Housing Surveys to examine whether the negative relationship between fertility and the price of living space disappears when the price of living space is measured on a per square foot rather than per room basis. The American Housing Surveys allowed us to compute mean housing cost per square foot, *CMSA COST/FT*^{2}, which includes basic utilities and insurance payments in addition to rent or mortgage payments, as well as *CMSA RENT/FT*^{2}. *CMSA COST/FT*^{2} averaged \$0.4726 (unweighted), with a standard deviation of \$0.1055. *CMSA RENT/FT*^{2} averaged \$0.34 in 1990 (standard deviation = 0.09, and \$0.53 in 2000 (standard deviation = 0.15).

The fertility regressions were re-estimated using 1980, 1990, and 2000 households in the 36 CMSAs common to the IPUMS and American Housing Surveys. The results are reported in **Table 5**. **Part A** contains results using *CMSA COST/FT*^{2}, and **Part B** using *CMSA RENT/FT*^{2}. The estimated coefficients on the individual-level demographic controls are similar to those estimated for the sample as a whole. The estimated coefficients on *CMSA COST/FT*^{2} for the years 1980 and 1990 were -0.386 and -0.350, and both were statistically significant at better than the 1 percent level. Each standard deviation increase in monthly housing cost per square foot

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[27] The figures were generated by regressing children ever born and instrumented real rent per room on the remaining covariates, retrieving the residuals, and averaging the residuals by CMSA. The outlier, clearly visible at the top of the graph, is Provo-Orem, Utah.

(about $0.12) is associated with a reduction in fertility of about 6 children per 100 households. The estimated coefficient on *CMSA COST/FT*^{2} for the year 2000 was positive but economically and statistically equal to zero. Although we are disappointed, we do not think, in light of the small number of CMSAs, that too much weight should be attached to this last finding.

Fertility regressions estimated for households in the American Housing Surveys are contained in the far right of **Table 5**. The specifications were identical to those used for the IPUMS data, augmented to include dummy variables for year (not reported to save space). The estimated coefficient on *CMSA COST/FT*^{2} was -0.43, with a standard error of 0.186 and t-statistic of -2.3, which is statistically significant at the 4 percent level.

The null result for the Census year 2000 aside, the results in this section suggest that the negative estimated effects of *CMSA RENT/ROOM* on fertility are not merely spurious.

9. Timing

9.1. Age at First Marriage and First Birth

Thus far, our analysis has focused on younger households, for many of whom fertility may not yet have been completed. The concern may therefore arise that the estimated effects of the price of living space indicate that households living in more expensive cities merely delay fertility until later in life. We investigated this argument in two ways. First, we estimated regressions for age at first marriage (1940, 1970, and 1980) and age at first birth (all years). Secondly, we estimated equations for cumulative lifetime fertility on households in which the wife is age 41 or higher, for whom fertility is presumably complete, information on which is available through 1990.

OLS estimates for age at first marriage are reported in **Table 6**. The estimated coefficients on *CMSA RENT/ROOM* were 0.0099 (1.56), 0.0148 (3.4), and 0.0069 (4.0) in 1940, 1970, and 1980. The estimated coefficient for 1940 was significant at only the 12 percent level, but the other 2 coefficients are significant at better than the 1 percent level. Each standard deviation in *CMSA RENT/ROOM* implies delays of 0.09 years (1.1 months) in 1940, 1.8 months in 1970, and 0.9 months in 1980. Although small in magnitude, the estimated effects are consistent with those of Borsch-Supan (1986), Haurin et. al. (1993), and Hughes (2003), who found household formation to be slower in more expensive cities.

Table 7 reports least-squares estimates of equations for age at first birth. The estimated coefficients on *CMSA RENT/ROOM* are all positive and, with the exception of 1950, are statistically significant at the 5 percent level or better. Each standard deviation in rent implies a delay of first birth of about 1.9 months in 1940 and 1950, and about 1.3 months thereafter.

Taken as a whole, higher housing prices appear to delay marriage and fertility, but the estimated magnitudes of the delays are too small to explain the negative effects on fertility itself. The next section offers somewhat more direct evidence on the question.

9.2. Lifetime Fertility

Fertility regression results for older women are presented in **Table 8**. As can be seen, the estimated effects of *CMSA RENT/ROOM* are somewhat larger in magnitude than for younger households. The estimated effects were not, however, statistically significant for the years 1950 (t=-1.4) or 1990 (t=-1.3). Recalling that the estimated effects were statistically significant for younger women in **Table 4**, there are at least two reasons why the estimates for older women might be less significant. First, older families are more likely to have finished raising their families; current rental prices do not necessarily reflect the rental prices they faced in the past. Second, older families have had time in which to move away from the city in which they raised their children. Despite these difficulties, all of the estimated coefficients were negative. In addition, they suggest that it is lifetime fertility, and not merely the timing of births, that is impacted by the price of living space.

10. Migration

Part of the negative correlation between fertility and the scarcity of living space could reflect the location decisions across CMSAs of otherwise observationally similar households with different underlying (unobservable) demands for children and urban amenities. We assessed the importance of selection in a number of ways.

10.1 Movers versus Stayers

First, we estimated equations for number of children in the household by mobility status. If our results are driven mainly by selection of high-fertility households into less-expensive CMSAs, the estimated effects of the price of living space on fertility should be smaller and less significant for households that have not moved recently. ***Short stayers*** are defined as households in which the wife lives in the same metropolitan area (METAREAD) as 5 years ago, but lives in a state different than her state of birth. ***Long stayers*** are defined as households in which the wife lives in the same metropolitan area as 5 years ago, and her current state of residence is the same as her state of birth. All other households are called ***movers***.

We re-estimated the fertility equations for number of children in the household by mobility status, and present the estimated coefficients on *CMSA RENT/ROOM* in **Table 9.** The estimated coefficients for short stayers were somewhat larger in magnitude than for the sample as a whole (**Table 4**) except for 1970, and were significant at the 9 percent level in 1940, the 8 percent level in 1990, and at better than the 1 percent level in the remaining years. The estimated coefficients for movers were positive in 1940 and 1950, and negative and significant for the years 1970, 1980, 1990, and 2000. The estimated effects for short stayers and movers were generally of similar magnitude. These results are inconsistent with the notion that selection is primarily responsible for our findings.

The estimated coefficients for long stayers were negative and statistically significant at the 10 percent level for the years 1950, 1970, and 1990, but not for the other years. Although this might be taken as evidence in favor of selective migration, such an explanation would have to explain why the estimated effects of the price of living space differ for stayers living inside and outside of their state of birth. One might posit, for example, that long stayers have higher mobility costs on average, and hence are less able to adjust their location to desired fertility.

The selection story has four implications. First, if households that move are sorting across CMSAs based on desired fertility, there is less reason to expect any relationship between fertility and the price of living space in the *origin* CMSA. Second, households with higher desired fertility should be more likely to move out of expensive CMSAs. Third, among households that choose to move, those with larger families should choose less expensive destinations. Finally, the selection story implies that choice of location *between* CMSAs is a more important determinant of the price of living space than choice of location *within* CMSAs. These implications are examined in the remainder of the paper.

10.2 Mover Fertility and Rent in Origin CMSA

If causality runs primarily from desired fertility to the price of living space, there is no reason to expect a negative relationship between the fertility among movers and the price of living space in their *origin* CMSA. **Table 10** reports fertility regressions for movers as a function of *CMSA RENT/ROOM* in the origin CMSA. Although the magnitudes and statistical significance of the estimated coefficients on origin *CMSA RENT/ROOM* were somewhat smaller than those for current *CMSA RENT/ROOM,* they were negative and statistically significant at the 5 percent level nonetheless: -0.0013 (t=-2.4), -0.0007 (t=-2.1), and -0.0005 (t=-2.1). These results are further evidence that our findings are not driven purely by selection.

10.3 Mobility between CMSAs and Fertility

We next examine whether larger households are more likely to leave more expensive cities. We are able to observe CMSA of residence 5 years prior to the Census survey from 1980 onward. We estimated a linear probability model for whether the household lived in a different CMSA than 5 years ago as a function of *CMSA RENT/ROOM* in the origin CMSA, number of children in the household at the survey date, and their interaction. If large families tend to leave expensive CMSAs, the interaction should have a positive estimated coefficient. The regressions control for age and education as of the 2000 Census survey date, race, labor force participation of the wife, and dummy variables for Census region. Again, we treat the number of children as exogenous.

The regression results are contained in **Table 11**. Focusing on the estimated coefficients of interest, number of children in the household entered with negative and statistically significant estimated coefficients. Each additional child is estimated to reduce the probability of moving between CMSAs by between 2.5 and 2.8 percentage points. The estimated coefficients on the interaction between *CMSA RENT/ROOM* and number of children were positive, but they were small in magnitude and with the exception of the year 2000, were statistically insignificant. Even for the year 2000, the total effect of family size on mobility becomes positive only at rents of $422 per room per month, a figure higher than observed in the data. This evidence is not consistent with strong sorting of larger households into less expensive CMSAs.

10.4 Housing Costs and Location Choice

Consider a household that relocates from neighborhood *n* in CMSA *c* to neighborhood *n'* in CMSA *c'*. The difference in the rent in the two locations can be expressed as the sum of within-CMSA and between CMSA differences:

$$(R_{n'c'} - R_{nc}) = \\ (R_{n'c'} - \overline{R}_{c'}) + (\overline{R}_{c} - R_{nc}) + (\overline{R}_{c'} - \overline{R}_{c})$$

where R denotes the *CMSA RENT/ROOM*, and a bar denotes the mean price of living space within the CMSA. The first term is equal to the within-CMSA deviation in housing prices in the neighborhood from the CMSA mean in the new location, the second is (minus) the within-CMSA deviation in the old location, and the third term is equal to the difference between CMSA means. If within-CMSA mobility is more important than between-CMSA mobility, family size should be more negatively correlated with $(R_{n'c'} - \overline{R}_{c'})$ (in the population as a whole) than $(\overline{R}_{c} - \overline{R}_{c'})$.

We focus first on households that moved between metropolitan areas. The third term on the right-hand side can be constructed for all households that moved between CMSAs. We regressed $(\overline{R}_{c'} - \overline{R}_{c})$ on the number of children and other individual-level covariates. The regression results are shown in **Table 12**. The estimated coefficient (t-statistic) on the number of children was -0.24 (-1.9) in 1980, -0.55 (-2.7) in 1990, and -1.15 (-2.3) in 2000. These coefficients imply that among households that moved between metropolitan areas, each additional child is associated with a decline in mean *CMSA RENT/ROOM* of between \$0.24 and \$1.15 per month. However, it should still be kept in mind that the presence of children in the household is associated with a lower probability of moving between CMSAs in the first place.

We turn next to location within the CMSA as measured by $(R_{n'c'} - \overline{R}_{c'})$, or *OWN RENT/ROOM* minus *CMSA RENT/ROOM*. Although we do not have information on average rents at the neighborhood level, the IPUMS data do contain information on each household's rental expenditure or, for owners, dwelling value in the current location, information that allows us to proxy the first term on the right-hand side. We address two questions. The first is the relationship between $(R_{n'c'} - \overline{R}_{c'})$ and the number of children in the household.[28] The second is whether the weaker relationship between fertility and *CMSA RENT/ROOM* among long stayers might reflect differences in housing choices between stayers and movers. We estimated regressions for $(R_{n'c'} - \overline{R}_{c'})$ as a function of mobility status using two specifications. The first augments the list of regressors to include intercept shifters for mobility status and the second allows mobility status to interact with *CMSA RENT/ROOM*.

The regression results are reported in **Table 13**. The estimated coefficients (t-statistics) on the number of children are all negative and statistically significant, ranging from -3.69 (-7.7)

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[28] For renters, R_{nc} was computed as monthly contract rent divided by rooms occupied; for owners, we converted value per room into rent per room based on bivariate CMSA-level regressions of median value per room on median rent per room for each year.

in 1980 to -7.54 (t=-6.7) in the year 2000. Thus, each additional child implies a reduction in *OWN RENT/ROOM* of between roughly $4 and $8 per month relative to *CMSA RENT/ROOM*, which estimated coefficients are much larger in magnitude than those estimated for movers between CMSAs. These estimates suggest that the relationship between housing expenditures and fertility is more a function of mobility *within* a CMSA than between CMSAs.

The likelihood of selection bias across CMSAs is reduced if households in even expensive CMSAs can find relatively inexpensive housing. Information about the CMSA is likely to be greater among households that have lived there a longer time. Such households might therefore be expected to make more efficient location choices, and hence spend less on housing than households that have recently moved into the CMSA. The models that include mobility intercept shifters indicate that long stayers paid between $7.50 and $16 per room less than otherwise comparable movers, and that short stayers paid between $6.25 and $12.65 per room less. The models that include interactions of the mobility indicators with *CMSA RENT/ROOM* suggest that the stayer-mover differentials are larger in more expensive CMSAs.

To summarize the findings of this section, among movers, the difference in rents between the destination and origin CMSA is smaller (more negative), the larger the number of children in the household. This is evidence that causality indeed may run from fertility to rent rather than the other way around. However, our concern about reverse causality is mitigated by a number of factors. First, mover fertility is inversely related to rents in the origin CMSA. It is difficult to explain why this should be the case if one believes simultaneously that (1) migration decisions are as rationally forecasted as fertility decisions and (2) causality runs entirely from fertility to location choice. Second, within the range of rents observed in our data, the presence of children reduces the probability of moving between CMSAs, even for larger families in more expensive CMSAs. It is difficult to believe that this should be the case if reverse causality is entirely responsible for the negative correlation between fertility and rent, unless one believes that households. Finally, we find that long-time residents of in any given CMSA pay lower rents than do recent migrants. This last fact suggests that longer-time residents of a CMSA are better informed and make more efficient location decisions, and could help explain why the estimated relationship between fertility and CMSA average rents is weaker for stayers than for movers.

11 Tests for Endogeneity

This section presents Durbin-Wu-Hausman tests for endogeneity of *CMSA RENT/ROOM*. These tests involve estimation of a first-stage regression for *CMSA RENT/ROOM* as a function of appropriate instruments, and estimating the fertility regression in the second stage augmented to include the residual from the first stage. Following Glaeser and Gyourko (2005), these instruments included construction costs from R.S. Means (2000) augmented with one of three sets of instrumental variables: (1) birth-state instruments; (2) current-state instruments; and (3) birth and state instruments combined. The variables included measures of educational attainment, climate, family income, female labor force participation, as well as state-level measures of rent per room (except for 1960) and population density. F-tests, not shown to save space, indicated that weak instruments were not a problem.

Table 14 reports probability values for Hansen's J-test of exogeneity (appropriateness) of the instruments. The exogeneity of the birth-state instruments is rejected at the 7 percent level or better in virtually year. In light of the J-test results, we focus on the results using only current-state instruments. [29] Durbin-Wu-Hausman tests of the null hypothesis that *CMSA RENT/ROOM* is exogenous can be rejected at the 10% percent level or better for only the year 1960, although the probability value for the year 1970 is close at 13.4%.

Table 14 presents IV estimates of the coefficient on *CMSA RENT/ROOM* for all years using current-state instruments. The estimated IV coefficient estimates were negative from 1950

[29] Some readers may object to the use of current-state instruments on the grounds that households choose their state. The question is not, however, whether households choose their location – of course, they do – but whether this choice is correlated with the error term in the fertility equation once one has controlled for other factors. Considering the large number of covariates in our regressions, including controls for climate, it is not surprising to us that our instruments pass tests for overidentification.

onward. Although the IV estimates were not statistically significant at conventional levels for 1990 and 2000, they do not miss by much, with t-values were -1.5 and -1.2. Our disappointment is further tempered by the fact that there is no evidence of endogeneity bias in those years.

More problematic is the year 1960, for which the estimated IV coefficient is -0.0015 with a t-statistic of just -0.5. Because the finest level of geographic detail for 1960 is the state, and the fertility regressions include a number of state-level variables as control variables, the ability of additional state-level variables to identify variations across states in *CMSA RENT/ROOM* is limited.

To get around the lack of CMSA-level information for 1960, we estimated IV fertility regressions using data on wives between the ages of 25 and 50 – wives who would have been between the ages of 15 and 40 in 1960 -- using 1970 data. Because children are more likely to have left households of older wives, we take as our dependent variable the number of children ever born. To reduce the chance that the sample contains wives who moved between CMSAs, we focused on long stayers, that is, on wives who lived in the same CMSA as 5 years previously and in the wife's state of birth.

To save space, we merely summarize the main findings here. The estimated OLS coefficient on real rent per room was -0.0145, with a t-statistic of -8.1. The estimated IV coefficient was -0.0807, with a t-statistic of -2.0. These IV results contrast sharply with those found using 1960 state-level data, and are more in line with those found for other years. Although we cannot be certain, these findings are at least consistent with our hypothesis that the weak results using 1960 data are due to the lack of geographic detail below the state level.

11. Concluding Remarks

Controlling for a broad array of individual-level and city-level characteristics, our estimates suggest that the price of living space has had a small but economically and statistically significant effect on the fertility decisions of households. How much of the variation in fertility across cities can be accounted for by variation in the price of housing? *CMSA RENT/ROOM* averaged $130 in the year 2000 across the 276 CMSAs, and the standard deviation was about $30. Cities with unit prices close to the mean included Reading, PA, Cedar Rapids, IA, St. Louis, MO, and Columbia, SC. The regression estimates for the year 2000 imply that fertility in cities with rents a standard deviation above the mean (Salt Lake City, UT, Portland, OR, and Houston, TX) should have been lower by about 0.03, or about 18 percent of the cross-city standard deviation of mean fertility of about 0.17, and about 0.06 lower in cities with rents two standard deviations above the mean (New Haven, CT, Seattle, WA, and Denver, CO).

One puzzle is why the results for the year 2000 are weaker than for prior census years. In experiments not reported here, we considered a number of possibilities. For example, family income has risen over time, and some have speculated that this might weaken the rent-fertility relationship. However, we controlled for the most important determinants of income in our regressions, and controlled for citywide median family income in our (admittedly cross-sectional) empirical work. We found no evidence that the relationship was weaker for families in higher-income states. Another possible explanation is the increase in the percentage of households of Hispanic origin. However, deleting Hispanic households from the sample did not strengthen the fertility-rent relationship.

One admittedly speculative possibility that might be explored in the future is the role of U.S. housing markets in the accumulation of wealth. The price of housing relative to other goods and services in the economy fell between the 1940s and about 1970, and then began to rise. If families began viewing the purchase of real estate not simply as an input into household production, but as an element of their portfolio of wealth, the most expensive cities may also have offered superior returns on their investment, an effect that could weaken or even offset any possible negative effects of the price of housing on fertility.

References

Anas, Alex, Richard Arnott, and Kenneth A. Small. "Urban Spatial Structure," *Journal of Economic Literature*, vol. 36 no. 3 (September 1998), 1426-64.

Black, Duncan and Vernon Henderson (1995). "A Theory of Urban Growth," *Journal of Political Economy*, vol. 107 no. 2 (April): 252-84.

Borsch-Supan, Axel. "Household Formation, Housing Prices, and Public Policy Impacts," *Journal of Public Economics*, Vol. 30 (1986): 145-64.

Brueckner, Jan and A.G. Largey, 2007. "Social Interactions and Urban Sprawl," *Journal of Urban Economics* doi:10.1016/j.jue.2007.08.002.

CIA, *The World Factbook*. Washington, D.C.: Central Intelligence Agency, 2004.

Clark, David, James R. Kahn, and Haim Ofek, 1988. "City Size, Quality of Life, and the Urbanization Deflator of the GNP: 1910-1984," *Southern Economic Journal*, vol. 54 no 3 (January): 701-14.

Costa, Dora L. "Estimating Real Income in the United States from 1888 to 1994: Correcting CPS Bias Using Engel Curves," *Journal of Political Economy*, Vol 109, no 6 (December 2001): 1288-1310.

Costa, Dora L. & Matthew E. Kahn, "Power Couples: Changes In The Locational Choice Of The College Educated, 1940-1990," *The Quarterly Journal of Economics*, vol. 115, no. 4 (November 2000), pages 1287-1315.

Crone, Theodore M.; Leonard I. Nakamura, and Richard Voith. "The CPI for Rents: A Case of Understated Inflation." Working Paper 04-17, Federal Reserve Bank of Philadelphia (September 2004).

Crum, F.S. "The Birth Rate in Massachusetts, 1850-90," *Quarterly Journal of Economics*, Vol. XI, No. 3 (April 1897): 248-65.

Easterlin, Richard A. and Eileen M. Crimmins. *The Fertility Revolution: A Supply-Demand Analysis*. Chicago, IL: University of Chicago Press, 1985.

Egan, Timothy. "Vibrant Cities Find One Thing Missing: Children," *New York Times,* March 24, 2005.

Ermisch, John. "Prices, Parents, and Young People's Household Formation," *Journal of Urban Economics* 45 (February 1999): 47-71.

Felsen, Marcus and Mauricio Solaún. "The Fertility-Inhibiting Effect of Crowded Apartment Living in a Tight Housing Market," *The American Journal of Sociology*, Vol. 80, No. 6 (May 1975): 1410-27.

Florida, Richard. *The Rise of the Creative Class*. Basic Books, New York, 2002.

Edward L. Glaeser and Gyourko, Joseph. "Urban Decline and Durable Housing," *Journal of Political Economy*, vol. 113, no. 2 (April 2005): 345-75.

Gans, Herbert J. *The Levittowners*. Pantheon Books, New York: 1967.

Giannelli, Gianna Claudia and Chiara Monfardini. "Joint Decisions on Household Membership and Human Capital Accumulation Among Youths: The Role of Expected Earnings and Labor Markets," *Journal of Population Economics* 16 (2003): 265-85.

Edward L. Glaeser and Gyourko, Joseph. "Urban Decline and Durable Housing," *Journal of Political Economy*, vol. 113, no. 2 (April 2005): 345-75.

Glaeser, Edward L, Joseph Gyourko, and Raven Saks, "Why is Manhattan So Expensive? Regulation and the Rise of Housing Prices," *Journal of Law and Economics*, vol. 48 no. 2 (October 2005): 331-70.

Gonzales, Richard. "San Francisco: A Childless Future?" *All Things Considered*, December 6, 2005 (Story ID 5041388).

Gordon, Robert J. and Todd vanGoethem. "A Century of Housing Shelter Prices: Is there a Downward Bias in the CPI?" NBER Working Paper 11776.

Guryan, Jonathan. "Desegration and Black Dropout Rates," *American Economic Review*, vol. 94, no. 4 (September 2004): 919-43.

Haurin, Donald, Patric H. Hendershott, and Dongwook Kim. "The Impact of Real Rents and Wages on Household Formation," *Review of Economics and Statistics*, Vol. 75, no. 2 (May, 1993): 284-93.

Haurin, Donald R. and David Brasington. "School Quality and Real Housing Prices: Inter and Intra-Metropolitan Effects," *Journal of Housing Economics* 5 (1996): 351-68.

Heeren, Henk. J. and Hein G. Moors. "Family Planning and Differential Fertility in a Dutch City," *Journal of Marriage and the Family*, vol. 31, no. 3 (August 1969): 588-95.

Hotz, V. Joseph, Jacob Alex Klerman, and Robert J. Willis. "The Economics of Fertility in Developed Countries." In *Handbook of Population and Family Economics*, edited by M.R. Rosenzweig and O. Stark. Amsterdam, Netherlands: Elsevier, 1997.

Hughes, Mary Elizabeth. "Home Economics: Metropolitan Labor and Housing Markets and Domestic Arrangements in Young Adulthood," *Social Forces*, Vol. 81 No. 4 (June 2003): 1399-1429.

Jackson, K.T. *Crabgrass Frontier: The Suburbanization of the United States*. New York: Oxford University Press, 1985.

Kitagawa, Evelyn M. and Philip M. Hauser. Trends in Differential Fertility and Mortality in a Metropolis – Chicago. In: Urban Sociology, edited by Ernest W. Burgess and Donald J. Bogue. Chicago, IL: The University of Chicago Press, 1967.

Kolata, Gina, "The Heart's Desire," *New York Times,* May 11, 2004, http://www.nytimes.com/2004/05/11/health/11FERT.html?ex=1146888000&en=ed973f461c46f59b&ei=5070.

Kohler, Hans-Peter; Francesco C. Billari; and José Antonio Ortega. "The Emergence of Lowest-Low Fertility in Europe During the 1990s," *Population and Development Review* 28 (December 2002): 641-80.

Leet, Don. R. *Population Pressure and Human Fertility Repsonse: Ohio, 1810-1860*. New York City: Arno Press, 1978.

Lindert, Peter H. *Fertility and Scarcity in America*. Princeton, N.J.: Princeton University Press, 1978.

Margo, Robert A. "The Rental Price of Housing in New York City, 1830-1860," *Journal of Economic History,* vol. 56 no. 3 (September 1996): 605-25.

Markowitz, Robin. Levittown. In St. James Encyclopedia of Popular Culture, http://www.findarticles.com/p/articles/mi_g1epc/is_tov/ai_2419100714. 2005.

Marshall, Alfred, *Principles of Economics*, 8th Edition. Porcupine Press, Philadelphia, 1920 (reprinted 1990).

Means, R.S. *Square Foot Costs, 26th Annual Edition* (2005). Boston, MA: Reed Construction Data, Inc. 2004.

Naz, Ghazala, Øivind Anti Nilson, and Steinar Vagstand. "Education and Completed Fertility in Norway," working paper (2002).

Roback, Jennifer (1982). "Wages, Rents, and the Quality of Life," *Journal of Political Economy*, vol. 90 no. 6 (December): 1257-78.

Santos Silva, J.M.C. and Francisco Covas. "A Modified Hurdle Model for Completed Fertility," *Journal of Population Economics* 13 (2000): 173-88.

Schultz, Paul T. "The Demand for Children in Low-Income Countries." In *Handbook of Population and Family Economics*. Edited by M.R. Rosenzweig and O. Stark. Vol 1A, chap. 8. Amsterdam: North-Holland, 1997.

Sato, Yasuhiro. "Fertility and Economic Geography." In *Handbook of Regional and Urban Economics*, vol. 3. Edited by J.V. Henderson and J-F Thisse. Vol. 3. Amsterdam: North-Holland, 2004.

Sato, Yasuhiro. "Economic Geography, Fertility, and Migration," *Journal of Urban Economics* (2006), doi:10.1016/j.jue.2006.08.002.

Simon, Curtis and Robert Tamura, "Fertility and the City" (May 2006) working paper.

Weber, Adna Ferrin, *The Growth of Cities in the Nineteenth Century: A Study in Statistics*, Cornell University Press, Ithaca, NY. 1899 (reprinted 1963).

Appendix B: Constructing a Deflator for Housing

We began with the Bureau of Labor Statistics' price index for rent of primary residence (series CUUR0000SEHA). Although this index is for rental housing only, the BEA relies heavily on the rental price index to construct the deflators for owners (Crone et. al. 2004, p. 26). Recent research suggests that this index is biased downward (Gordon and vanGoethem, 2005; Crone et. al. 2004).[30] Based on the findings of Gordon and vanGoethem (2005, p. 44) we have adjusted the rental inflation index upward by a percentage point per year.[31] To construct the numeraire, we first adjusted the overall CPI based on the findings of Costa (2001).[32] The numeraire is then computed as $CPI_X = (CPI - w_H{*}CPI_H)/(1\text{-}w_H)$, where CPI_H denotes the price index for housing and w_H is housing's share in the overall CPI. Housing share was set at a relatively conservative $w_H = 0.25$ for the entire period.[33]

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[30] Margo (1996) found that correcting for biases in measuring housing prices reduced estimates of real wage growth between the 1830s and 1850s by about 7 percent (pp. 621-2).

[31] Constructing an index that includes owner-occupied housing is beyond the scope of our paper. Costa (2001) suggests that such an index would exhibit greater volatility because housing prices are more volatile than rents. This omission biases the CPI downward during the housing boom in the first half of the 1920s and upward from the 1925 peak to the 1935 trough in housing markets (p. 1303).

[32] She found the CPI to be biased downward by 0.1 percent between 1914 and 1918; upward by 0.7 percent per year between 1919 and 1935; upward by 0.4 percent during the 1960s; upward by 2.7 between 1970 and 1982; and upward by 0.6 percent between 1983 and 1994. In absence of evidence for the periods 1936-1949 and 1994 onward, we assumed that the 1960s bias of 0.4 percent applied during the former and that 1980s-90s bias of 0.6 percent applied during the latter.

[33] For example, in 2001-2002, rent of shelter comprised 32.5 percent of the CPI-U, but we did not have information for all years readily available. Small changes in the weights will have only minor impacts on the resulting relative price series.

Appendix A. Cities in American Housing Survey

City	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Anaheim		X				X			X			
Atlanta			X				X					X
Baltimore			X				X					
Birmingham				X				X				
Boston	X				X				X			
Buffalo				X						X		
Charlotte											X	
Chicago			X				X					
Cincinnati		X				X						
Cleveland				X				X				X
Columbus			X				X				X	
Dallas	X				X					X		
DC	X				X				X			
Denver		X				X					X	
Detroit	X				X				X			
Fort Worth	X				X					X		
Hartford			X				X					X
Houston			X				X					
Indianapolis				X				X				X
Kansas City		X				X					X	
Los Angeles	X				X							
Memphis				X				X				X
Miami		X				X					X	
Milwaukee				X						X		
Minneapolis	X				X				X			
New Orleans		X				X					X	
New York			X				X					
Newark			X				X					
Norfolk				X				X				
Oklahoma City				X				X				X
Philadelphia	X				X							
Phoenix	X				X					X		
Pittsburgh		X				X					X	
Portland OR		X				X					X	
Providence				X				X				
Rochester		X				X						
Sacramento												X
Salt Lake City				X				X				
San Antonio		X				X					X	
San Bernardino		X				X				X		
San Diego			X				X			X		
San Francisco	X				X				X			
San Jose				X					X			
Seattle			X				X					X
St Louis			X				X					X
Tampa	X				X				X			

Appendix B: Constructing a Deflator for Housing

We began with the Bureau of Labor Statistics' price index for rent of primary residence (series CUUR0000SEHA). Although this index is for rental housing only, the BEA relies heavily on the rental price index to construct the deflators for owners (Crone et. al. 2004, p. 26). Recent research suggests that this index is biased downward (Gordon and vanGoethem, 2005; Crone et. al. 2004).[34] Based on the findings of Gordon and vanGoethem (2005, p. 44) we have adjusted the rental inflation index upward by a percentage point per year.[35] To construct the numeraire, we first adjusted the overall CPI based on the findings of Costa (2001).[36] The numeraire is then computed as $CPI_X = (CPI - w_H{*}CPI_H)/(1\text{-}w_H)$, where CPI_H denotes the price index for housing and w_H is housing's share in the overall CPI. Housing share was set at a relatively conservative $w_H = 0.25$ for the entire period.[37]

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[36] She found the CPI to be biased downward by 0.1 percent between 1914 and 1918; upward by 0.7 percent per year between 1919 and 1935; upward by 0.4 percent during the 1960s; upward by 2.7 between 1970 and 1982; and upward by 0.6 percent between 1983 and 1994. In absence of evidence for the periods 1936-1949 and 1994 onward, we assumed that the 1960s bias of 0.4 percent applied during the former and that 1980s-90s bias of 0.6 percent applied during the latter.

[37] For example, in 2001-2002, rent of shelter comprised 32.5 percent of the CPI-U, but we did not have information for all years readily available. Small changes in the weights will have only minor impacts on the resulting relative price series.

Table 1. Mean Children in Household and CMSA RENT/ROOM in 40 Largest CMSAs: Younger Households, 2000

	Children	CMSA RENT/ROOM
Raleigh--Durham--Chapel Hill, NC MSA	1.32	$ 166
Nashville, TN MSA	1.46	$ 146
Greensboro--Winston-Salem--High Point, NC MSA	1.46	$ 127
Austin--San Marcos, TX MSA	1.47	$ 197
San Francisco--Oakland--San Jose, CA CMSA	1.47	$ 284
Charlotte--Gastonia--Rock Hill, NC--SC MSA	1.47	$ 148
Atlanta, GA MSA	1.48	$ 178
Tampa--St. Petersburg--Clearwater, FL MSA	1.49	$ 157
Washington--Baltimore, DC--MD--VA--WV CMSA	1.49	$ 187
Seattle--Tacoma--Bremerton, WA CMSA	1.49	$ 192
New Haven--Meriden, CT NECMA	1.50	$ 189
Denver--Boulder--Greeley, CO CMSA	1.50	$ 194
New Orleans, LA MSA	1.50	$ 131
Boston--Worcestor--Lawrence, MA--NH--ME--CT NECMA	1.51	$ 181
Norfolk--Virginia Beach--Newport News, VA--NC MSA	1.52	$ 140
Columbus--Newark, OH PMSA	1.53	$ 136
Miami--Fort Lauderdale, FL CMSA	1.54	$ 222
Kansas City, MO--KS MSA	1.55	$ 139
Pittsburgh, PA MSA	1.56	$ 114
New York--Northern New Jersey--Long Island, NY--NJ--CT--PA CMSA	1.57	$ 215
Dallas--Fort Worth, TX CMSA	1.57	$ 174
Portland--Salem, OR--WA CMSA	1.58	$ 165
Orlando, FL MSA	1.58	$ 174
Philadelphia--Wilmington--Atlantic City, PA--NJ--DE--MD CMSA	1.59	$ 168
San Diego, CA MSA	1.60	$ 211
Milwaukee--Racine, WI CMSA	1.60	$ 146
Indianapolis, IN MSA	1.60	$ 139
Cincinnati--Hamilton, OH--KY--IN CMSA	1.61	$ 127
Minneapolis--St. Paul, MN--WI MSA	1.62	$ 178
Las Vegas, NV--AZ MSA	1.62	$ 182
Chicago--Gary--Kenosha, IL--IN--WI CMSA	1.63	$ 167
Detroit--Ann Arbor--Flint, MI CMSA	1.64	$ 145
St. Louis, MO--IL MSA	1.64	$ 131
Cleveland--Akron, OH CMSA	1.66	$ 127
San Antonio, TX MSA	1.68	$ 144
Houston--Galveston--Brazoria, TX CMSA	1.69	$ 163
Sacramento--Yolo, CA CMSA	1.73	$ 175
Phoenix--Mesa, AZ MSA	1.73	$ 177
Salt Lake City--Ogden, UT MSA	1.78	$ 160
Los Angeles--Riverside--Orange County, CA CMSA	1.81	$ 226

Note: Mean children in household taken from IPUMS 2000 household data, weighted by person weight

Table 2. Summary Statistics, IPUMS and CMSA-Level Data

Part A: IPUMS Households

	1940		1950		1960		1970		1980		1990
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean
Children in household	1.448	1.500	1.466	1.338	2.154	1.616	2.032	1.592	1.622	1.290	1.553
Children ever born	1.539	1.615	1.602	1.476	2.292	1.747	2.152	1.739	1.706	1.390	1.621
Years ed, female	9.309	3.223	10.545	2.987	10.921	2.810	11.846	2.550	12.551	2.476	13.236
Years ed, male	9.134	3.643	0.000	0.000	10.743	3.453	12.025	3.060	12.850	2.761	13.362
Age, female	30.654	5.932	30.197	5.961	30.337	6.271	29.633	6.211	30.100	5.789	31.593
Age, male	34.835	7.625	…	…	33.963	7.809	32.877	7.872	32.996	7.254	34.480
Black female	0.074	0.262	0.084	0.277	0.084	0.278	0.099	0.298	0.082	0.275	0.076
Hispanic female	0.020	0.141	0.023	0.150	0.027	0.163	0.056	0.230	0.080	0.271	0.109
Other female	0.002	0.042	0.003	0.056	0.009	0.097	0.018	0.133	0.036	0.187	0.052
Foreign born	0.197	0.398	0.064	0.245	0.091	0.288	0.159	0.366	0.140	0.347	0.187
Central city	0.552	0.497	0.500	0.500	0.265	0.441	0.000	0.000	0.277	0.448	0.206
Unknown central city	0.113	0.316	0.114	0.318	0.028	0.164	0.000	0.000	0.163	0.369	0.355
Female LF participant	0.194	0.396	0.259	0.438	0.305	0.461	0.410	0.492	0.591	0.492	0.705
Mid Atlantic	0.319	0.466	0.279	0.448	0.183	0.387	0.221	0.415	0.168	0.374	0.163
East north central	0.242	0.429	0.225	0.418	0.204	0.403	0.204	0.403	0.190	0.392	0.162
West north central	0.060	0.237	0.058	0.235	0.083	0.276	0.050	0.218	0.048	0.213	0.050
South Atlantic	0.095	0.293	0.105	0.307	0.147	0.354	0.119	0.324	0.146	0.354	0.161
East south central	0.041	0.198	0.041	0.198	0.066	0.248	0.020	0.140	0.045	0.208	0.043
West south central	0.059	0.235	0.072	0.258	0.098	0.297	0.087	0.281	0.107	0.309	0.112
Mountain	0.012	0.110	0.019	0.135	0.041	0.198	0.033	0.179	0.046	0.210	0.051
Pacific	0.095	0.293	0.128	0.334	0.124	0.329	0.182	0.386	0.173	0.379	0.192
Observations	24,655		34,544		205,462		254,779		174,038		167,861

Table 2, Continued.
Part B: CMSA-Level Data (276 CMSAs)

CMSA RENT/ROOM	$ 24.16	$ 8.93	$ 31.90	$ 6.48	$ 46.42	$ 9.40	$ 52.17	$ 10.09	$ 72.66	$ 11.02	$ 88.94
Female LFP rate	0.253	0.053	0.304	0.222	0.354	0.091	0.411	0.045	0.500	0.051	0.563
% College grads	0.048	0.017	0.063	0.024	0.083	0.024	0.111	0.042	0.162	0.053	0.194
% Catholic	0.119	0.131	0.160	0.164	0.210	0.136	0.173	0.157	0.166	0.142	0.169
Real family income	$ 35,308	$ 7,728	$ 20,511	$ 4,489	$ 32,690	$ 6,709	$ 39,676	$ 6,164	$ 40,006	$ 5,268	$ 43,492
Ln(Real family income)	10.445	0.239	9.902	0.239	10.370	0.218	10.576	0.162	10.588	0.135	10.669
Heating degree days	4424.1	2262.0	4424.1	2262.0	4687.0	1924.6	4424.1	2262.0	4424.1	2262.0	4424.1
Cooling degree days	1425.5	963.9	1425.5	963.9	1155.1	756.6	1425.5	963.9	1425.5	963.9	1425.5
Average precipitation	37.5	14.1	37.5	14.1	37.3	11.7	37.5	14.1	37.5	14.1	37.5

Note: Summary statistics in **Part A** are weighted by person line weight except for 1940 and 1950, which are weighted by sample line weight. Summary statistics in **Part B** are unweighted.

Table 3. Demand for Living Space, IPUMS and AHS Data

	Number of Rooms, IPUMS: Price of Living Space = Median Rent per Room								AHS: Price of Living Space = Monthly Housing Cost/Ft^2	
	1970		1980		1990		2000			
rooms	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Number of children	0.29	22.0	0.29	24.9	0.29	25.6	0.29	28.9	**75.5**	**24.1**
CMSA RENT/ROOM	-0.02	-6.0	-0.01	-6.1	-0.01	-7.8	-0.01	-7.6	-1684.3	-8.9
Years ed, female	0.06	28.8	0.08	27.2	0.09	25.9	0.09	33.7	31.8	17.2
Years ed, male	0.08	40.9	0.11	32.4	0.10	18.0	0.09	16.8	41.6	14.2
Female 15-20	-0.43	-16.3	-0.42	-12.8	-0.33	-7.5	-0.14	-2.5	-41.3	-2.4
Female 21-25	-0.31	-31.9	-0.29	-19.0	-0.29	-13.2	-0.26	-10.1	-68.1	-7.9
Female 31-35	0.19	19.1	0.27	26.4	0.24	18.6	0.31	18.5	82.3	12.5
Female 36-40	0.33	21.8	0.42	32.7	0.45	24.1	0.51	30.5	173.9	19.1
Male 15-20	-0.12	-3.1	-0.27	-7.9	-0.19	-2.8	-0.06	-1.1	-83.2	-3.1
Male 21-25	-0.27	-14.0	-0.24	-16.0	-0.27	-9.5	-0.18	-7.2	-53.9	-6.0
Male 31-35	0.17	10.5	0.24	15.9	0.25	17.6	0.22	14.8	74.0	8.7
Male 36-40	0.26	16.0	0.34	16.4	0.38	23.1	0.38	17.6	137.7	12.4
Male 41+	0.29	13.8	0.33	12.8	0.51	22.9	0.41	14.0	187.9	15.9
Black female	-0.40	-8.0	-0.46	-17.2	-0.55	-17.6	-0.52	-20.8	-69.6	-3.6
Hispanic female	-0.37	-12.8	-0.37	-9.5	-0.48	-12.2	-0.23	-6.0	-57.5	-4.2
Other female	-0.63	-16.4	-0.62	-13.7	-0.72	-19.3	-0.37	-9.1	-146.4	-9.7
Foreign Born	-0.17	-5.7	-0.30	-7.9	-0.42	-11.5	-0.69	-17.3	…	…
Central city	…	…	-0.30	-3.3	-0.46	-3.9	-0.56	-4.6	-57.7	-3.7
Unknown cc	…	…	-0.13	-4.8	-0.17	-4.3	-0.20	-4.5	…	…
Female LF participant	-0.13	-16.3	-0.02	-1.5	-0.01	-0.4	0.04	4.4	-39.6	-4.8
% college grads	0.72	0.9	0.54	1.1	0.02	0.1	-0.07	-0.1	-428.3	-0.5
% Catholic	-0.08	-0.8	-0.02	-0.2	0.43	3.5	0.10	0.6	642.4	6.1
ln (Real fam inc)	1.84	5.4	1.11	5.1	1.42	4.8	1.27	3.6	545.1	1.7
% Female LFP	-0.27	-0.5	-0.02	0.0	0.46	0.8	0.87	1.2	1690.2	2.4

Table 3, Continued.

Avg precipitation	0.00	2.6	0.00	0.7	0.00	-1.8	0.00	-1.1	-1.5	-1.0
Heat deg days	0.00	0.2	0.00	1.2	0.00	-0.2	0.00	1.8	0.0	-0.5
Cool deg days	0.00	0.4	0.00	1.0	0.00	-0.9	0.00	0.8	0.0	-1.8
Mid Atlantic	0.04	0.9	0.15	2.5	0.05	1.3	0.22	2.8	3.4	1.3
East north central	0.00	-0.1	0.03	0.7	-0.01	-0.2	0.09	1.2	4.1	0.7
West north central	-0.02	-0.3	0.03	0.7	0.02	0.2	0.14	1.7	-6.3	-1.7
South Atlantic	0.23	3.1	0.26	4.4	0.21	2.0	0.30	2.9	5.7	3.7
East south central	-0.04	-0.5	0.09	1.5	0.09	0.9	0.24	2.5	9.8	1.5
West south central	-0.08	-0.9	-0.03	-0.6	-0.10	-1.1	0.13	1.3	-3.2	-0.7
Mountain	0.25	1.8	0.30	3.2	-0.05	-0.6	0.15	1.5	7.9	0.6
Pacific	0.15	1.5	0.12	1.3	-0.04	-0.5	-0.01	-0.1	-16.4	-3.3
Intercept	-15.45	-4.6	-8.20	-3.8	-11.44	-4.2	-10.76	-3.0	-5454.0	-1.6
R-Square	0.3075		0.3029		0.3092		0.3166		0.2224	
Observations	253,130		172,944		166,854		166,161		76,095	

Table 4. OLS Regressions for Children in the Household, Young IPUMS Households

	1940		1950		1960		1970		1980		1990		2000	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
CMSA RENT/ROOM	**-0.0004**	**-0.2**	**-0.0067**	**-4.0**	**-0.0070**	**-2.7**	**-0.0101**	**-9.0**	**-0.0039**	**-5.5**	**-0.0019**	**-3.2**	**-0.0011**	**-2.8**
Other CMSA-Level Controls														
% college grads	-1.2377	-0.6	1.2464	1.4	2.7493	1.5	0.6093	1.9	0.1356	0.5	-0.2350	-0.9	-0.1684	-0.6
% Catholic	-0.4323	-2.3	-0.1815	-2.4	0.2440	1.4	0.2634	3.3	-0.0439	-0.7	-0.0293	-0.5	-0.0534	-0.7
ln(Real fam income)	-0.7309	-3.5	-0.1582	-1.4	-0.6294	-3.0	0.2821	2.4	-0.1610	-2.0	-0.2443	-2.8	-0.1913	-2.0
% Fem LFP in CMSA	-0.9927	-1.5	-0.0150	-1.6	0.0838	0.2	0.0913	0.3	-0.1140	-0.4	0.4989	1.7	0.1416	0.4
Avg precip	-0.0020	-0.8	0.0007	0.8	-0.0010	-0.8	-0.0007	-0.9	-0.0014	-2.2	-0.0024	-3.0	-0.0023	-2.9
Heating deg days	0.0001	2.2	0.0001	4.7	0.0001	5.4	0.0001	7.2	0.0000	6.5	0.0000	3.9	0.0000	3.5
Cooling deg day	0.0000	-0.7	0.0001	2.0	0.0001	2.1	0.0002	6.1	0.0001	4.1	0.0001	3.0	0.0000	2.6
Individual-Level Covariates														
Years ed, female	-0.0557	-13.5	-0.0542	-16.7	-0.0402	-10.5	-0.0734	-12.0	-0.0816	-27.3	-0.0728	-19.0	-0.0651	-19.3
Years ed, male	-0.0447	-9.6	…	…	-0.0289	-12.2	-0.0242	-18.5	-0.0309	-20.4	-0.0279	-14.6	-0.0331	-21.6
Female age 15-20	-0.5240	-13.3	-0.9092	-25.0	-1.0122	-35.9	-1.0336	-34.1	-0.8022	-48.8	-0.6913	-33.7	-0.6413	-32.8
Female age 21-25	-0.2204	-7.6	-0.4568	-24.0	-0.4691	-38.3	-0.5894	-42.6	-0.4299	-49.9	-0.3383	-34.9	-0.2765	-25.9
Female age 31-35	0.2511	9.7	0.2495	10.1	0.1387	9.2	0.5167	45.9	0.4020	42.2	0.3309	35.1	0.3299	36.0
Female age 36-40	0.4251	10.7	0.2779	6.3	0.0410	1.4	0.6083	29.9	0.6418	38.4	0.4612	23.4	0.4644	29.9
Male age 15-20	-0.1839	-2.2	…	…	-0.6017	-18.1	-0.4520	-24.7	-0.3599	-18.0	-0.2939	-9.8	-0.3352	-9.5
Male age 21-25	-0.1578	-5.7	…	…	-0.2906	-22.1	-0.2888	-38.8	-0.2135	-19.3	-0.1935	-9.6	-0.1188	-8.4
Male age 31-35	0.1772	6.0	…	…	0.2430	17.5	0.3018	28.7	0.1954	29.3	0.2435	24.0	0.2308	28.0
Male age 36-40	0.2956	8.1	…	…	0.3466	21.9	0.4483	26.8	0.3646	43.6	0.3621	33.6	0.4217	36.9
Male age 41+	0.3563	8.0	…	…	0.1285	6.0	0.2014	10.8	0.2088	10.7	0.1435	8.7	0.2819	16.3
Black female	-0.1714	-3.4	0.0393	0.9	0.3261	6.4	0.3123	9.3	0.4309	26.0	0.3210	18.9	0.2990	18.6
Hispanic female	0.4922	5.2	0.4787	5.1	0.4162	3.9	0.2721	4.6	0.2861	8.8	0.2294	7.1	0.2356	7.5
Other female	0.7098	2.4	-0.0479	-0.5	-0.0127	-0.3	-0.0865	-2.0	0.0574	2.9	-0.0053	-0.3	0.0165	1.4
Foreign born	0.0565	1.9	-0.1291	-4.7	-0.2395	-9.8	-0.3273	-28.0	-0.1137	-11.7	-0.0087	-0.5	-0.0885	-9.9
Central City	-0.2048	-7.4	-0.2012	-10.3	-0.1738	-6.4	…	…	-0.1177	-9.3	-0.1077	-9.2	-0.1288	-9.2
Unknown CC	-0.1180	-2.8	-0.0426	-1.5	-0.1500	-3.7	…	…	-0.0088	-0.6	-0.0165	-1.3	-0.0362	-3.0
Female LF Participant	-0.8222	-43.4	-0.8179	-58.1	-0.8120	-45.8	-0.6067	-33.6	-0.5264	-40.1	-0.5356	-48.9	-0.4406	-39.1

Table 4, Continued.

Mid Atlantic	-0.1413	-2.0	-0.1297	-3.4	-0.1382	-3.9	-0.1157	-4.0	-0.0283	-1.4	-0.0314	-1.4	-0.0069	-0.3
East north central	-0.1157	-1.4	-0.0694	-1.5	0.1049	1.6	0.0082	0.3	0.0310	1.5	0.0028	0.1	0.0157	0.8
West north central	-0.1998	-2.1	-0.1175	-2.3	0.0674	1.2	0.0586	1.6	0.0377	1.5	0.0155	0.6	0.0534	2.3
South Atlantic	-0.0586	-0.7	-0.0887	-1.8	-0.0081	-0.1	-0.0063	-0.2	-0.0650	-2.7	-0.0883	-3.5	-0.0565	-2.0
East south central	-0.1729	-1.6	-0.0058	-0.1	-0.0344	-0.4	-0.0531	-1.1	-0.0594	-2.2	-0.0781	-2.7	-0.0664	-2.0
West south central	0.0164	0.1	0.0419	0.8	0.0545	0.9	-0.0334	-0.9	0.0379	1.3	-0.0201	-0.6	0.0015	0.1
Mountain	-0.0574	-0.2	0.1168	1.4	…	…	0.0916	1.1	0.0941	1.0	0.0081	0.1	0.0362	0.6
Pacific	-0.0871	-0.7	0.0555	0.9	0.2654	4.0	0.2955	5.7	0.1365	3.9	0.1014	2.3	0.1020	2.5
Intercept	10.5509	4.9	3.8066	3.3	9.2608	4.3	0.1197	0.1	4.8974	6.0	5.4086	6.3	4.9075	4.8
R-Square	0.2094		0.1734		0.1913		0.3096		0.3046		0.2094		0.1903	
Observations	24,655		34,544		119,816		253,130		172,944		166,854		166,161	
Clusters	117		127		32		103		218		224		237	

Table 5. Fertility and Price of Living Space per Square Foot: IPUMS and AHS Households in 36 CMSAs

	IPUMS Households						AHS Households	
	1980		1990		2000		1985-1996	
A. Main Results								
	Coef.	Z	Coef.	Z	Coef.	Z	Coef.	Z
REAL COST/FT^2	**-0.5547**	**-6.5**	**-0.5131**	**-6.2**	**0.0299**	**0.3**	**-0.4343**	**-2.3**
Other CMSA-Level Controls								
% college grads	0.0442	0.1	-1.2291	-1.4	-1.4075	-2.2	0.2079	0.6
% Catholic	-0.1777	-2.3	-0.0808	-0.5	-0.0137	-0.1	-0.1286	-1.4
Ln(Real family income)	-0.3210	-2.9	-0.0401	-0.1	-0.1146	-0.6	0.0108	0.1
% Female LFP	0.5748	2.1	1.0195	2.0	1.0059	2.2	-0.0761	-5.7
Avg precip	-0.0029	-3.4	-0.0033	-3.2	-0.0012	-1.0	-0.0050	-3.5
Heating degree days	0.0000	3.1	0.0000	1.4	0.0000	1.7	0.0000	2.4
Cooling degree days	0.0001	1.3	0.0000	0.1	0.0000	0.7	0.0000	2.7
Individual-Level Controls								
Years ed, female	-0.0789	-20.4	-0.0688	-14.3	-0.0618	-14.5	-0.0462	-29.1
Years ed, male	-0.0321	-16.1	-0.0321	-14.8	-0.0330	-18.0	-0.0138	-8.7
Female 15-20	-0.7805	-33.7	-0.6732	-20.8	-0.6310	-26.0	-0.5137	-13.3
Female 21-25	-0.4173	-40.7	-0.3313	-28.4	-0.2624	-23.9	-0.2812	-13.1
Female 31-35	0.4104	34.2	0.3461	33.6	0.3444	31.4	0.2293	18.5
Female 36-40	0.6748	35.5	0.4976	20.8	0.5090	34.3	0.3272	13.6
Male 15-20	-0.3346	-12.3	-0.3079	-7.3	-0.3042	-5.9	-0.4571	-5.8
Male 21-25	-0.1990	-12.6	-0.1815	-5.5	-0.1007	-5.6	-0.2287	-12.3
Male 31-35	0.2026	25.2	0.2440	19.0	0.2311	24.2	0.1874	15.8
Male 36-40	0.3680	40.5	0.3688	26.5	0.4429	32.4	0.2501	18.5
Male 40+	0.2373	9.8	0.1727	8.7	0.3193	16.3	0.1429	7.4

Table 5, Continued.

Black female	0.4207	18.8	0.2953	15.9	0.3022	16.9	0.2033	15.2
Hispanic female	0.2776	6.1	0.2493	5.6	0.2785	7.0	0.1442	8.7
Other female	0.0628	2.5	-0.0227	-1.2	0.0179	1.4	-0.0232	-1.5
Foreign born	-0.0955	-8.6	-0.0201	-0.8	-0.1012	-10.4	…	…
Central city	-0.1296	-8.9	-0.1023	-7.5	-0.1403	-7.9	-0.3373	-26.9
Unknown CC	0.0448	1.6	-0.0029	-0.2	-0.0298	-1.6	…	…
Female LF Participant	-0.5538	-30.1	-0.5578	-38.5	-0.4540	-29.1	0.5139	1.0
Mid Atlantic	-0.0365	-1.6	-0.0038	-0.1	-0.0061	-0.2	0.0007	0.5
East north central	-0.0133	-0.4	-0.0074	-0.2	-0.0073	-0.2	-0.0021	-0.7
West north central	-0.0551	-1.6	-0.0077	-0.2	0.0480	0.9	-0.0053	-1.4
South Atlantic	-0.1292	-3.7	-0.0491	-1.1	-0.0347	-0.8	-0.0030	-2.7
East south central	-0.1372	-3.3	0.0052	0.1	-0.0433	-0.9	0.0038	0.8
West south central	-0.0541	-0.8	0.0655	0.8	0.0043	0.1	-0.0070	-2.8
Mountain	0.0045	0.0	0.1240	0.6	0.0735	0.6	-0.0222	-2.8
Pacific	0.0770	2.1	0.0877	1.5	0.0578	1.2	0.0007	0.2
_cons	6.4044	5.3	3.2751	1.2	3.6054	2.0	0.96211	0.5
R-Square	0.3034		0.2145		0.1961		0.0715	
Observations	108,729		103,512		105,762		76,094	
B. Price of Living Space Measured as CMSA RENT/FOOT								
CMSA RENT/FT^2	**-1.2768**	**-3.7**	**-0.8073**	**-5.5**	**-0.1111**	**-0.9**	**-0.4282**	**-2.6**
R-Square	0.3033		0.1961		0.1961		0.0715	

Note: Fertility regression on AHS households includes year dummy variables, which are not reported to save space.

Table 6. Age at First Marriage, IPUMS: Least Squares Regressions

	1940		1970		1980	
	Coef.	t	Coef.	t	Coef.	t
CMSA RENT/ROOM	0.0099	1.6	0.0148	3.4	0.0069	4.0
Other CMSA-Level Controls						
% Female LFP	10.6955	2.4	1.3538	1.0	1.8486	4.0
% college grads	2.2256	4.2	1.5346	4.9	2.0869	11.3
% Catholic	-0.1990	-0.3	-1.0644	-2.0	0.2058	0.8
Ln(Real family income)	2.5649	2.0	0.0471	0.1	0.3535	0.9
Avg precip	0.0031	0.6	-0.0120	-3.2	-0.0047	-2.1
Heating deg days	0.0001	1.6	-0.0001	-3.9	0.0000	0.0
Cooling deg days	0.0001	0.6	-0.0002	-3.2	-0.0001	-1.6
Individual-Level Controls						
Years ed, female	0.1598	11.7	0.1256	5.9	0.3986	16.7
Years ed, male	0.0982	11.4	0.0291	2.7	0.0939	17.0
Black female	-0.5316	-4.1	-0.0435	-0.7	0.5481	9.4
Hispanic female	-0.3826	-1.8	-2.4867	-3.3	0.3939	2.7
Other female	-0.3328	-0.5	1.0453	5.1	0.9173	14.7
	0.5885	11.1	0.4460	2.6	1.1936	16.9
Central city	0.2205	4.5	(dropped)		0.2945	11.0
Unknown CC	0.1115	1.0	(dropped)		-0.0396	-0.9
Female LF Participant	0.6005	9.0	0.1224	2.4	0.1472	6.0
Mid Atlantic	-0.1950	-1.2	0.2355	2.2	0.2880	4.4
East north central	-0.5723	-3.3	-0.0315	-0.3	-0.1053	-1.5
West north central	-0.5292	-2.6	-0.0699	-0.5	-0.1829	-2.0
South Atlantic	-0.4337	-2.3	0.0251	0.2	0.1953	2.6
East south central	-0.7100	-2.8	0.0497	0.4	-0.0409	-0.4
West south central	-0.9947	-4.1	-0.0897	-0.6	-0.3637	-4.0
Mountain	-1.2440	-4.0	-0.3253	-1.8	-0.2863	-2.6
Pacific	-0.7013	-2.4	-0.4575	-3.0	-0.1831	-1.5
Intercept	18.1414	3.0	19.4132	3.5	10.5496	4.0
R-Square	0.0856		0.0056		0.1527	
Observations	24,655		253,130		172,944	

Table 7. Age at First Birth, IPUMS: Least Squares Regressions

	1940		1950		1970		1980		1990		2000	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
CMSA RENT/ROOM	0.0182	2.4	0.0227	2.6	0.0107	3.5	0.0097	2.7	0.0047	1.9	0.0037	2.9
Other CMSA-Level Controls												
% college grads	-0.5832	-0.1	4.1211	1.3	0.6595	0.7	1.6432	2.5	3.0944	3.8	2.8159	3.5
% Catholic	2.4221	3.6	1.6592	3.4	1.4714	7.6	1.8732	9.4	1.7976	7.4	1.4237	6.0
Ln(Real family income)	-0.5122	-0.7	0.4776	0.8	-0.2213	-0.8	-0.4412	-1.3	1.3675	3.1	1.0904	2.9
% Female LFP	6.1413	3.4	0.1052	1.7	1.8612	3.2	2.7959	4.9	-1.4498	-1.8	0.1588	0.2
Avg precip	0.0059	0.9	0.0146	4.4	0.0038	1.5	-0.0009	-0.5	0.0039	1.5	-0.0036	-1.4
Heating deg days	0.0000	-0.6	0.0001	2.0	0.0000	-2.0	-0.0001	-2.4	0.0000	1.1	0.0000	0.2
Cooling deg days	-0.0003	-1.6	0.0002	1.5	-0.0001	-2.6	-0.0002	-3.7	0.0001	0.9	0.0001	1.7
Individual-Level Controls												
Years ed, female	0.2379	10.3	0.3042	12.1	0.4180	17.3	0.5211	16.9	0.4961	11.0	0.4422	14.1
Years ed, male	0.1512	12.1	(dropped)		0.1168	24.4	0.1944	17.3	0.2413	15.5	0.2432	12.5
Black female	-1.1968	-5.1	-1.5914	-9.1	-0.8960	-18.0	-1.3653	-24.3	-1.6955	-17.6	-1.7853	-25.4
Hispanic female	-0.3903	-1.7	-0.5374	-2.2	0.4890	4.3	0.1154	0.8	-0.5831	-4.2	-0.7672	-4.2
Other female	-1.4598	-2.3	0.8554	2.3	1.0850	12.5	0.3444	5.4	0.2013	2.4	-0.3826	-8.2
Foreign born	0.6221	8.7	0.7539	7.5	0.9283	11.8	1.1203	9.8	0.7764	6.4	0.8364	7.0
Central city	0.1380	1.5	0.3544	6.7	(dropped)		0.0358	1.0	0.0122	0.2	-0.2921	-2.5
Unknown CC	-0.1323	-0.9	0.0872	0.8	(dropped)		-0.1349	-2.9	-0.0849	-1.7	-0.1923	-3.1
Female LF Participant	-0.4101	-3.4	-0.7758	-10.9	-0.4159	-24.4	-0.3515	-15.8	-0.0968	-2.8	-0.2229	-5.4
Mid Atlantic	0.1043	0.5	-0.0650	-0.3	0.3151	4.8	0.2820	3.1	0.2738	3.3	0.0145	0.1
East north central	0.0747	0.3	-0.5704	-2.2	-0.0780	-1.0	0.0358	0.4	0.0201	0.2	-0.4184	-4.2
West north central	0.1432	0.6	-0.4806	-1.8	-0.1728	-1.7	0.0222	0.2	0.0932	0.6	-0.6572	-5.5
South Atlantic	0.1219	0.4	-0.5538	-2.1	0.0240	0.3	0.3039	3.3	0.3313	2.6	-0.2994	-2.3
East south central	-0.5886	-1.7	-0.6854	-2.4	0.0020	0.0	0.1615	1.4	0.2199	1.7	-0.3764	-2.6
West south central	0.1980	0.7	-1.2313	-4.8	-0.2441	-2.4	-0.0835	-0.7	-0.0005	0.0	-0.6778	-5.1
Mountain	0.5160	1.4	-0.8691	-2.2	-0.3420	-2.6	-0.2815	-2.1	-0.0969	-0.6	-1.0280	-6.7
Pacific	-0.1706	-0.5	-0.2798	-1.0	-0.4751	-3.9	-0.3428	-2.8	0.1399	1.1	-0.5661	-3.8
Intercept	21.4455	2.9	12.3316	2.1	16.0177	5.2	15.7697	4.6	-2.1686	-0.5	1.8445	0.5
R-Square	0.1245		0.1133		0.1813		0.2259		0.2082		0.2100	
Observations	9,804		18,776		149,890		96,487		85,486		78,215	

Table 8. OLS Regressions for Children Ever Born, Older Households (Wives Age 41 and Over)

	1940		1950		1960		1970		1980		1990	
	Coef.	z	Coef.	z	Coef.	z	Coef.	z	Coef.	z	Coef.	z
CMSA RENT/ROOM	**-0.0121**	**-3.2**	**-0.0075**	**-1.4**	**-0.0202**	**-5.5**	**-0.0107**	**-7.9**	**-0.0060**	**-5.2**	**-0.0015**	**-1.3**
Other CMSA-Level Controls												
% Coll grad	2.6632	0.9	-2.8073	-1.3	2.3349	0.8	1.6267	2.2	0.9490	2.1	0.5509	1.2
% Catholic	-0.1013	-0.3	-0.0043	0.0	0.2778	1.2	-0.0422	-0.3	0.1882	1.4	0.3069	2.3
Ln(Real Fam Inc)	-1.5652	-3.3	-1.2935	-3.6	-0.5395	-1.5	-0.1372	-0.6	-0.3916	-2.2	-0.6186	-3.4
%Female LFP	-1.1494	-0.7	-0.0113	-0.3	1.1142	1.2	-0.1155	-0.3	-0.2141	-0.5	0.9280	1.8
Avg precip	-0.0019	-0.5	-0.0097	-3.0	-0.0048	-2.3	-0.0025	-2.0	-0.0026	-1.8	-0.0023	-1.4
Heating deg days	0.0000	1.0	0.0001	2.3	0.0000	0.5	0.0001	4.7	0.0001	6.5	0.0001	2.7
Cooling deg day	-0.0001	-1.3	0.0000	-0.4	-0.0001	-1.5	0.0001	2.2	0.0001	3.1	0.0001	1.5
Individual-Level Controls												
Years ed, female	-0.1047	-13.6	-0.1094	-16.8	-0.0701	-21.3	-0.0574	-20.5	-0.0667	-19.5	-0.0804	-19.3
Years ed, male	-0.0527	-6.6	…	…	-0.0455	-16.0	-0.0351	-12.5	-0.0320	-12.7	-0.0328	-9.6
Female 46-50	-0.0454	-0.8	0.1240	3.7	-0.2539	-17.6	-0.2467	-17.5	0.0922	5.9	0.3211	23.2
Female 51-55	-0.0913	-1.4	0.1483	3.1	-0.3149	-16.1	-0.4926	-31.4	-0.0514	-2.2	0.6671	27.1
Female 56-60	-0.0616	-0.8	0.2672	6.3	-0.2829	-10.5	-0.7059	-37.6	-0.3115	-12.9	0.8012	27.8
Female 61-65	-0.1921	-1.9	0.3758	7.1	-0.2116	-6.9	-0.8120	-31.7	-0.5882	-18.0	0.6498	20.8
Female 66-70	-0.0769	-0.6	0.5250	5.9	-0.1952	-6.8	-0.8168	-31.1	-0.7975	-22.7	0.4616	11.5
Female 71+	0.3171	2.0	0.5244	5.8	-0.0750	-1.7	-0.6395	-18.9	-0.8649	-23.1	0.0304	0.8
Male < 41	-0.2388	-1.9	…	…	-0.2148	-5.6	-0.1962	-7.4	-0.2111	-5.4	-0.1656	-6.9
Male 46-50	0.1570	2.6	…	…	0.0125	0.7	-0.0615	-3.2	0.0906	5.0	-0.0092	-0.6
Male 51-55	0.3114	4.4	…	…	-0.0729	-3.4	-0.1565	-7.7	0.0760	3.2	-0.0037	-0.2
Male 56-60	0.3326	3.8	…	…	-0.1480	-5.2	-0.2349	-8.9	-0.0249	-1.0	-0.0344	-1.4
Male 61-65	0.4097	4.4	…	…	-0.1742	-6.4	-0.2872	-12.1	-0.0896	-2.9	-0.0765	-2.6
Male 66-70	0.5235	4.4	…	…	-0.0655	-2.2	-0.3557	-11.9	-0.1360	-3.7	-0.1406	-5.3
Male 71+	0.5549	4.8	…	…	0.0564	1.1	-0.2695	-7.7	-0.1658	-4.1	-0.2455	-6.8
Black female	-0.0791	-0.6	-0.1584	-2.2	-0.0573	-1.0	0.1892	3.6	0.4401	8.0	0.4181	11.7
Hispanic female	0.9278	2.4	0.8774	3.5	1.0328	5.4	0.7615	5.1	0.8378	5.9	0.6834	7.2
Other female	1.5359	3.4	1.3437	3.2	0.6848	3.5	0.4654	8.9	0.4851	7.2	0.4717	14.9
Central City	0.4397	7.4	0.2386	5.4	0.0061	0.2	-0.0907	-8.3	-0.2211	-8.2	-0.1718	-7.5

Table 8, continued.

Unknown CC	-0.3511	-5.6	-0.3219	-6.8	-0.2660	-9.7	…	…	-0.1778	-8.3	-0.1485	-4.2
Foreign Born	-0.0487	-0.6	-0.0732	-1.0	-0.0623	-0.9	…	…	0.0057	0.2	-0.0231	-1.0
Female LF Participant	-0.7065	-10.1	-0.4242	-10.5	-0.3775	-14.8	-0.2809	-21.5	-0.1157	-10.0	-0.1097	-9.2
Mid Atlantic	0.0841	0.9	-0.0638	-0.8	-0.0601	-1.0	-0.2103	-4.3	-0.1545	-3.5	-0.1098	-2.1
East north central	0.0987	0.9	-0.0669	-0.7	0.1593	1.4	-0.0624	-1.1	0.0343	0.6	-0.0210	-0.4
West north central	-0.0441	-0.3	-0.1884	-1.9	0.0657	0.9	-0.1166	-1.5	0.0374	0.7	-0.0553	-0.9
South Atlantic	0.2191	1.3	0.1478	1.3	0.0712	0.7	-0.0955	-1.6	-0.0117	-0.2	-0.1002	-1.8
East south central	-0.0633	-0.4	0.1122	0.8	0.1639	1.2	0.0206	0.3	0.0613	0.8	-0.0780	-1.2
West south central	0.4541	2.8	0.2787	2.3	0.1387	1.6	-0.0219	-0.3	0.1684	2.5	-0.0276	-0.4
Mountain	0.1511	0.9	0.3268	1.0	…	…	0.0223	0.1	0.1719	1.4	0.0135	0.1
Pacific	-0.1119	-0.7	-0.0524	-0.3	-0.0471	-0.5	0.0779	1.0	0.3006	4.2	0.1552	2.0
Constant	21.0393	4.2	16.8331	4.6	9.9527	2.7	5.8118	2.4	8.2180	4.4	9.6854	5.6
R-Square	0.1044		0.0808		0.0679		0.0638		0.0778		0.0904	
Observations	20,053		27,328		113,489		276,010		182,041		198,503	
Clusters	117		127		32		103		218		224	

Table 9. OLS Regressions for Children in Household by Mobility Group

Estimated Coefficients on CMSA RENT/ROOM

	Coef	Robust Standard Error	t	Obs	Percent of total
A. Short Stayers					
1940	-0.0059	0.0035	-1.7	7,438	0.30
1950	-0.0113	0.0033	-3.5	12,066	0.35
1960	-0.0164	0.0027	-6.0	30,663	0.26
1970	-0.0078	0.0019	-4.1	28,734	0.23
1980	-0.0049	0.0011	-4.7	23,078	0.27
1990	-0.0016	0.0009	-1.8	48,289	0.29
2000	-0.0015	0.0004	-3.5	54,707	0.33
B. Long Stayers					
1940	0.0017	0.0025	0.7	12,742	0.52
1950	-0.0057	0.0029	-2.0	19,540	0.57
1960	-0.0047	0.0037	-1.3	55,885	0.47
1970	-0.0140	0.0017	-8.0	48,611	0.38
1980	-0.0039	0.0011	-3.6	39,616	0.46
1990	-0.0017	0.0008	-2.0	74,195	0.44
2000	0.0002	0.0004	0.5	67,112	0.40
C. Movers					
1940	0.0039	0.0035	1.1	4,475	0.18
1950	0.0074	0.0055	1.4	2,938	0.09
1960	-0.0005	0.0030	-0.2	31,624	0.27
1970	-0.0084	0.0013	-6.6	49,395	0.39
1980	-0.0025	0.0011	-2.5	23,537	0.27
1990	-0.0028	0.0007	-4.0	44,370	0.27
2000	-0.0015	0.0003	-4.7	44,342	0.27

Table 10. Fertility and Origin CMSA RENT/ROOM: Movers Only

	1980		1990		2000	
	Coef.	t	Coef.	t	Coef.	t
ORIGIN CMSA RENT/ROOM	-0.0013	-2.4	-0.0007	-2.1	-0.0005	-2.1
Other CMSA-Level Controls						
% college grads	-0.9010	-2.3	-0.6852	-1.9	-0.5454	-1.4
% Catholic	-0.2601	-3.2	-0.1107	-1.3	-0.3478	-2.5
ln(Real family income)	-0.1444	-1.2	-0.4606	-4.1	-0.4428	-4.0
% Female LFP	-0.2246	-0.7	1.0164	2.8	0.6787	1.1
Avg precip	0.0005	0.5	-0.0031	-2.9	-0.0014	-1.4
Heating degree days	0.0000	2.8	0.0000	3.3	0.0000	1.5
Cooling degree days	0.0000	0.5	0.0001	2.2	0.0000	-0.3
Individual-Level Controls						
Years ed, female	-0.0882	-16.8	-0.1011	-15.3	-0.0878	-15.2
Years ed, male	-0.0363	-7.4	-0.0356	-6.8	-0.0436	-12.0
Female 15-20	-0.7967	-19.2	-0.6677	-17.1	-0.5853	-12.4
Female 21-25	-0.3999	-17.8	-0.3018	-15.0	-0.2206	-8.4
Female 31-35	0.4232	15.7	0.3647	17.5	0.3754	18.8
Female 36-40	0.6318	16.8	0.5039	20.2	0.5486	20.5
Male 15-20	-0.3213	-6.4	-0.2918	-4.2	-0.2632	-3.9
Male 21-25	-0.1568	-7.7	-0.1775	-6.6	-0.1178	-5.4
Male 31-35	0.1824	7.0	0.2218	11.7	0.2040	10.3
Male 36-40	0.3995	10.8	0.3376	16.9	0.3929	15.0
Male 41+	0.1792	3.6	0.0568	1.8	0.2325	6.8
Black female	0.3644	10.2	0.2914	10.7	0.3512	12.9
Hispanic female	0.2846	6.2	0.1840	4.9	0.1508	4.7
Other female	0.0823	1.6	0.0910	2.5	0.0573	2.4
Foreign born	-0.1122	-4.7	0.0033	0.1	-0.0467	-2.2
Central city	-0.1312	-5.4	-0.1456	-5.6	-0.1788	-5.7
Unknown CC	-0.0162	-0.7	-0.0298	-1.6	-0.0502	-2.6
Female LF Participant	-0.6110	-32.6	-0.6288	-28.9	-0.5970	-42.0
MAT	-0.0455	-1.5	-0.0708	-1.8	-0.0776	-2.4
ENC	0.0131	0.4	0.0240	0.8	-0.0632	-1.8
WNC	-0.0083	-0.1	-0.0766	-1.6	-0.0139	-0.3
SAT	0.0190	0.5	-0.0268	-0.8	-0.1066	-2.5
ESC	-0.0066	-0.1	-0.0333	-0.7	-0.0916	-1.5
WSC	0.0977	2.1	-0.0460	-1.0	-0.0676	-1.6
MTN	0.1250	2.1	-0.1105	-1.4	-0.1015	-1.5
PAC	0.1536	2.7	0.0615	1.1	-0.0578	-1.0
Intercept	4.9630	3.8	7.9225	7.0	8.0080	6.3
R-Square	0.3363		0.2639		0.2600	
Observations	14,930		26,644		23,997	
Clusters	218		224		237	

Table 11. Mobility of Young Households: Linear Probability Models

Dependent Variable: Household Lives in a Different Metro Area than 5 Years Ago

	1980		1990		2000	
	Coef.	t	Coef.	t	Coef.	t
OLD CMSA RENT/ROOM	-0.0009	-0.6	-0.0004	-0.4	0.0002	0.4
Children	-0.0258	-1.7	-0.0231	-2.6	-0.0282	-3.5
x OLD CMSA RENT	0.0001	0.8	0.0001	0.9	0.0001	1.7
Years ed, female	0.0095	9.5	0.0094	12.4	0.0088	12.1
Years ed, male	0.0158	17.4	0.0161	16.5	0.0155	10.8
Female 15-20	-0.0096	-0.9	-0.0254	-2.6	-0.0229	-2.3
Female 21-25	0.0120	2.3	0.0199	3.2	0.0115	2.2
Female 31-35	-0.0331	-7.9	-0.0291	-9.3	-0.0278	-9.2
Female 36-40	-0.0569	-10.6	-0.0561	-14.0	-0.0503	-13.8
Male 15-20	-0.0097	-0.7	0.0190	1.0	0.0079	0.4
Male 21-25	0.0109	1.6	0.0048	0.7	0.0183	2.9
Male 31-35	-0.0127	-2.7	-0.0348	-9.1	-0.0304	-6.6
Male 36-40	-0.0291	-5.0	-0.0561	-12.2	-0.0561	-12.8
Male 41+	-0.0406	-5.6	-0.0649	-14.0	-0.0731	-12.8
Black female	-0.0458	-7.1	-0.0154	-1.6	-0.0122	-1.7
Hispanic female	-0.0327	-2.4	-0.0106	-1.2	-0.0295	-3.1
Other female	0.0115	0.8	0.0176	1.7	0.0335	4.4
Foreign born	0.0273	3.2	0.0321	4.9	0.0308	4.6
Fem LF Participant	-0.0281	-6.1	-0.0442	-10.7	-0.0377	-9.1
Mid Atlantic	-0.3109	-3.2	-0.1857	-2.4	-0.0278	-1.8
East north central	-0.3240	-3.5	-0.1952	-2.6	-0.0250	-1.1
West north central	-0.3196	-3.4	-0.2152	-2.9	-0.0255	-1.2
South Atlantic	-0.2231	-2.3	-0.1115	-1.5	0.0471	2.5
East south central	-0.2850	-3.0	-0.1925	-2.5	0.0088	0.3
West south central	-0.2224	-2.4	-0.1649	-2.2	0.0261	1.3
Mountain	-0.1822	-1.8	-0.1231	-1.6	0.0723	2.5
Pacific	-0.1855	-1.9	-0.0938	-1.2	0.0170	0.7
Constant	0.2635	1.9	0.1370	1.1	-0.0897	-1.0
R-Square	0.0913		0.0624		0.0588	
Observations	77,756		149,345		145,986	

Table 12. Change in CMSA Mean Rent per Room, Movers	1980		1990		2000	
	Coef.	t	Coef.	t	Coef.	t
Children	-0.2447	-1.9	-0.5535	-2.7	-1.1496	-2.3
Years ed, female	-0.0187	-0.3	0.2272	1.6	0.5726	2.7
Years ed, male	0.1854	2.5	0.6550	4.9	1.5569	5.1
Female 15-20	0.2163	0.3	3.4115	2.5	1.6835	0.7
Female 21-25	0.3955	1.1	1.2168	1.7	2.7047	3.0
Female 31-35	0.2796	0.7	-0.1797	-0.4	-0.9168	-1.0
Female 36-40	-0.4600	-0.9	0.5310	0.8	-1.1953	-1.1
Male 15-20	-0.3183	-0.3	1.2340	0.5	0.1713	0.0
Male 21-25	-0.0698	-0.2	-0.1818	-0.3	0.7317	0.5
Male 31-35	-0.4460	-1.3	-1.7295	-2.9	-2.2924	-2.5
Male 36-40	-0.2223	-0.4	-1.5100	-2.4	-3.1584	-3.1
Male 41+	-0.1790	-0.3	-1.5746	-2.1	-3.4232	-3.0
Black female	1.0000	1.2	1.0173	0.9	0.9375	0.8
Hispanic female	-1.9139	-2.1	-3.4127	-2.4	-5.7036	-2.6
Other female	-1.4406	-1.9	-0.2735	-0.2	-1.9419	-1.1
Foreign born	0.7745	0.9	0.8422	0.8	-0.1774	-0.1
Fem LF Participant	0.6653	2.7	1.5024	2.6	1.9494	2.6
Mid Atlantic	0.9065	0.2	-5.7150	-0.8	4.3595	0.4
East north central	-0.4129	-0.3	-8.8864	-2.8	-8.4677	-1.3
West north central	-2.7849	-2.6	-12.1369	-5.9	-6.8691	-0.7
South Atlantic	3.8020	1.2	-0.5786	-0.2	1.6209	0.2
East south central	-8.1586	-5.4	-18.6980	-6.9	-17.5422	-2.5
West south central	2.2975	0.8	-5.9167	-1.8	0.9556	0.1
Mountain	4.0614	1.3	-11.5768	-2.6	2.4178	0.3
Pacific	6.1258	2.7	9.7594	1.5	20.8818	1.6
Constant	-4.0514	-3.4	-9.2779	-3.3	-31.1858	-3.6
R-Square	0.0531		0.0755		0.0654	
Observations	14,930		26,644		23,997	

Table 13. Deviation of Own Rent per Room from CMSA Mean Rent Per Room

	1980				1990				2000			
	(i)		(ii)		(i)		(ii)		(i)		(ii)	
# Children	-3.69	-7.7	-3.69	-7.7	-5.62	-7.4	-5.6	-7.4	-7.53	-6.8	-7.40	-6.7
Individual-Level Controls	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Years ed, female	0.59	3.8	0.60	4.0	0.23	0.5	0.26	0.6	2.85	7.6	2.87	8.1
Years ed, male	1.03	9.2	1.04	9.5	1.05	3.8	1.08	4.1	3.76	10.9	3.78	11.2
Female 15-20	6.99	5.9	7.01	5.9	7.46	4.0	7.46	4.0	2.92	0.8	3.15	0.9
Female 21-25	2.59	4.8	2.62	4.8	4.74	3.8	4.82	3.9	0.49	0.3	0.64	0.4
Female 31-35	0.34	0.7	0.34	0.7	-0.45	-1.0	-0.48	-1.1	1.54	1.7	1.51	1.7
Female 36-40	0.73	1.1	0.72	1.1	-0.26	-0.4	-0.34	-0.6	3.69	3.8	3.66	3.8
Male 15-20	4.09	3.7	4.10	3.7	5.98	1.9	6.12	1.9	-2.35	-0.7	-1.82	-0.5
Male 21-25	2.24	4.3	2.29	4.3	3.80	5.1	3.88	5.2	-2.06	-1.2	-1.75	-1.0
Male 31-35	0.89	2.2	0.88	2.1	-2.06	-4.5	-2.09	-4.6	3.67	3.8	3.51	3.7
Male 36-40	2.44	5.1	2.43	5.0	-1.61	-2.4	-1.64	-2.4	6.20	8.5	6.11	8.3
Male 40+	2.14	2.4	2.15	2.4	-2.42	-2.2	-2.44	-2.2	6.69	5.8	6.58	5.6
Black female	-4.91	-5.8	-4.87	-5.7	-1.82	-1.5	-1.96	-1.6	-20.72	-5.1	-20.91	-5.1
Hispanic female	0.42	0.4	0.61	0.5	8.86	3.9	9.03	3.9	-8.47	-3.6	-7.86	-3.5
Other female	9.17	4.8	9.08	4.9	16.36	7.2	15.88	7.3	5.52	2.8	5.34	2.8
Foreign born	10.18	7.9	9.93	7.9	21.44	6.3	20.27	6.5	27.85	11.2	26.12	11.5
Central city	1.08	0.6	1.10	0.6	10.15	2.2	10.34	2.2	12.17	1.9	12.67	1.9
Unknown CC	-1.46	-1.7	-1.45	-1.6	1.61	1.2	1.50	1.1	3.41	1.4	3.27	1.4
Female LF Participant	0.32	1.0	0.28	0.9	-2.72	-4.7	-2.83	-5.1	-11.78	-11.2	-11.84	-11.1
Mid Atlantic	3.76	3.6	2.84	2.6	7.92	5.4	6.14	4.2	-19.15	-2.8	-19.69	-2.9
East north central	3.33	3.0	2.38	1.9	3.10	1.7	0.74	0.4	-1.50	-0.3	-2.74	-0.5
West north central	4.03	1.7	3.07	1.3	7.32	3.3	4.67	2.2	0.69	0.1	-0.23	0.0
South Atlantic	1.97	1.5	0.71	0.5	0.45	0.2	-2.12	-0.8	-12.79	-2.1	-13.52	-2.2
East south central	6.67	4.3	5.36	3.2	10.81	4.0	7.64	2.8	-0.14	0.0	-1.03	-0.2
West south central	2.60	1.7	1.64	0.9	4.54	1.3	2.18	0.6	-9.95	-1.4	-10.30	-1.5
Mountain	2.49	1.2	1.15	0.5	8.29	2.0	5.70	1.5	-4.14	-0.5	-6.16	-0.7
Pacific	4.77	1.8	3.47	1.3	1.80	0.5	-0.73	-0.2	-14.68	-1.6	-15.83	-1.8

Table 12, continued.

CMSA-Level Controls												
% college grads	2.18	0.2	4.05	0.3	-48.82	-2.6	-41.29	-2.2	-88.51	-3.8	-82.57	-3.6
% Catholic	13.63	4.3	12.10	3.6	11.35	2.4	9.00	2.0	11.87	1.3	10.20	1.1
ln(Real family income)	11.36	2.6	10.78	2.4	19.77	2.0	16.29	1.7	47.52	3.1	48.64	3.0
% Female LFP	14.59	1.3	12.64	1.1	10.16	0.5	11.11	0.6	-167.72	-5.3	-172.98	-5.3
Avg precip	-0.15	-3.3	-0.15	-3.3	-0.03	-0.5	-0.03	-0.5	-0.04	-0.3	-0.07	-0.5
Heating degree days	0.00	-4.6	0.00	-4.6	0.00	-3.7	0.00	-3.4	-0.01	-4.6	-0.01	-4.5
Cooling degree days	0.00	-5.0	-0.01	-4.9	-0.01	-7.2	-0.01	-6.8	-0.02	-7.6	-0.02	-7.5
Mobility x Rent Controls												
Long stayer	-7.52	-13.4	9.42	3.2	-14.57	-12.2	16.17	5.0	-16.11	-7.6	37.05	5.5
Short stayer	-7.02	-10.8	6.25	1.8	-13.09	-11.2	-1.99	-0.3	-12.65	-6.4	14.74	1.6
CMSA RENT/ROOM	-0.35	-8.7	-0.21	-3.8	0.00	0.0	0.16	2.3	-0.04	-0.7	0.14	1.7
x Long stayer			-0.21	-5.6			-0.28	-7.7			-0.32	-7.2
x Short stayer			-0.16	-3.6			-0.10	-1.6			-0.16	-2.6
	-93.54	-2.3	-97.13	-2.3	-177.61	-1.9	-159.42	-1.8	-381.62	-2.4	-421.52	-2.5
Intercept												
R-Square	0.1036		0.1048		0.3409		0.3431		0.2726		0.275	
Observations	74,066		74,066		160,099		168,976		158,849		158,849	
CMSAs	218		218		224		224		237		237	

Table 14. Endogeneity Diagnostics and Instrumental Variables Estimates

	OLS		all insts				**birth ONLY**				**NO birth**			
					prob values				**prob values**				**prob values**	
year	**coeff**	**robust t-stat**	**coeff**	**robust t-stat**	**DWH**	**J**	**coeff**	**robust t-stat**	**DWH**	**J**	**coeff**	**robust t-stat**	**DWH**	**J**
1940	-0.0004	-0.2	0.0048	1.0	0.168	0.092	0.0003	0.0	0.768	0.026	0.0017	0.4	0.267	0.096
1950	-0.0067	-4.0	-0.0071	-2.1	0.973	0.092	-0.0055	-1.0	0.767	0.070	-0.0063	-2.1	0.879	0.013
1960	-0.0076	-2.6	-0.0024	-0.8	0.007	0.002	-0.0019	-0.4	0.046	0.001	-0.0015	-0.5	0.022	0.443
1970	-0.0101	-9.0	-0.0059	-2.3	0.042	0.016	-0.0043	-0.9	0.097	0.000	-0.0072	-3.0	0.134	0.158
1980	-0.0039	-5.5	-0.0031	-2.7	0.906	0.043	-0.0006	-0.3	0.122	0.000	-0.0041	-3.7	0.816	0.399
1990	-0.0019	-3.2	-0.0022	-1.8	0.986	0.027	-0.0006	-0.3	0.384	0.014	-0.0017	-1.5	0.402	0.500
2000	-0.0011	-2.8	-0.0007	-1.1	0.778	0.071	0.0023	2.2	0.002	0.000	-0.0008	-1.2	0.595	0.041

Figure 1. Fertility and Population Density, Selected Countries

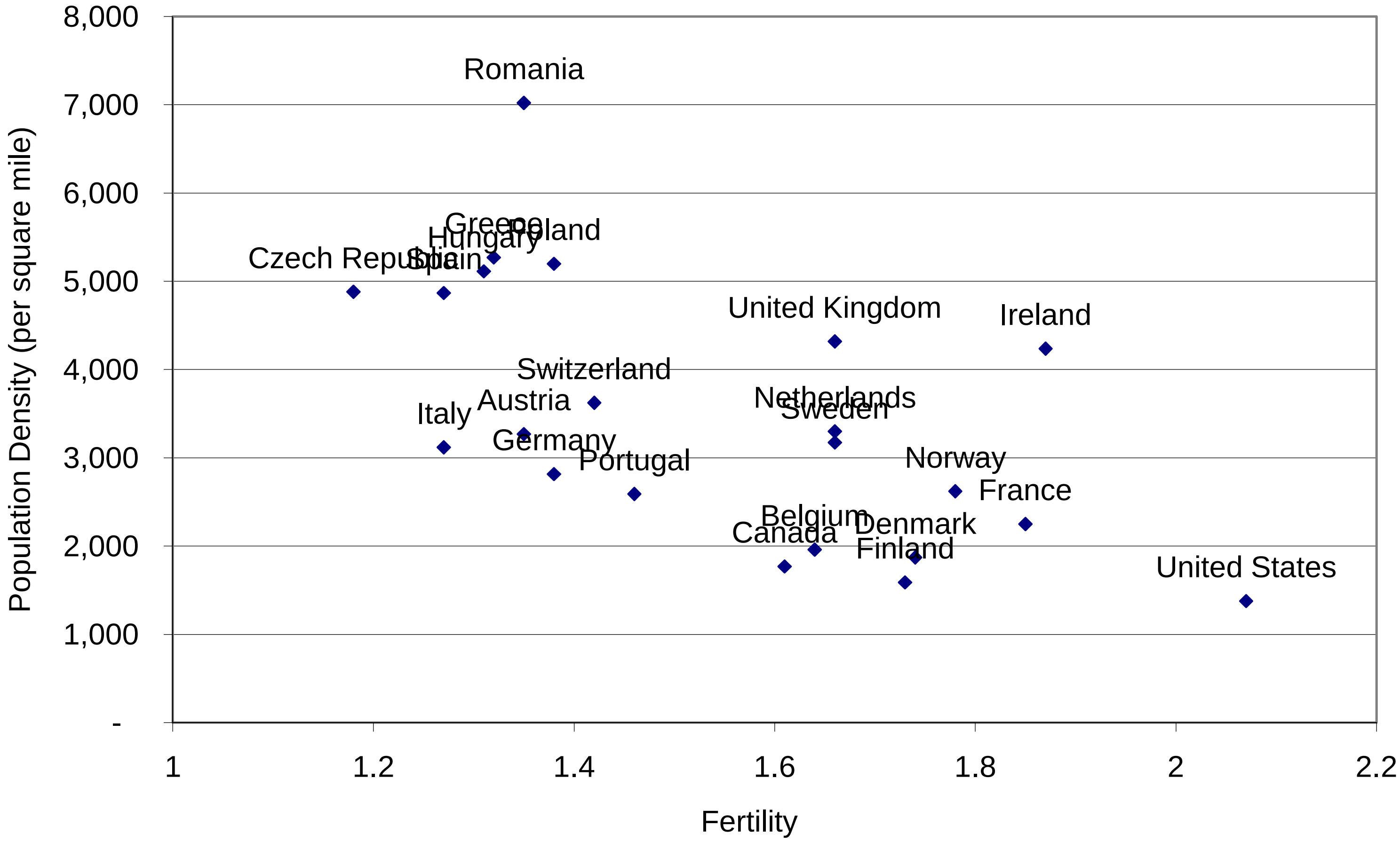

Figure 2. Mean Children in Household and CMSA RENT/ROOM:
Census Year 2000

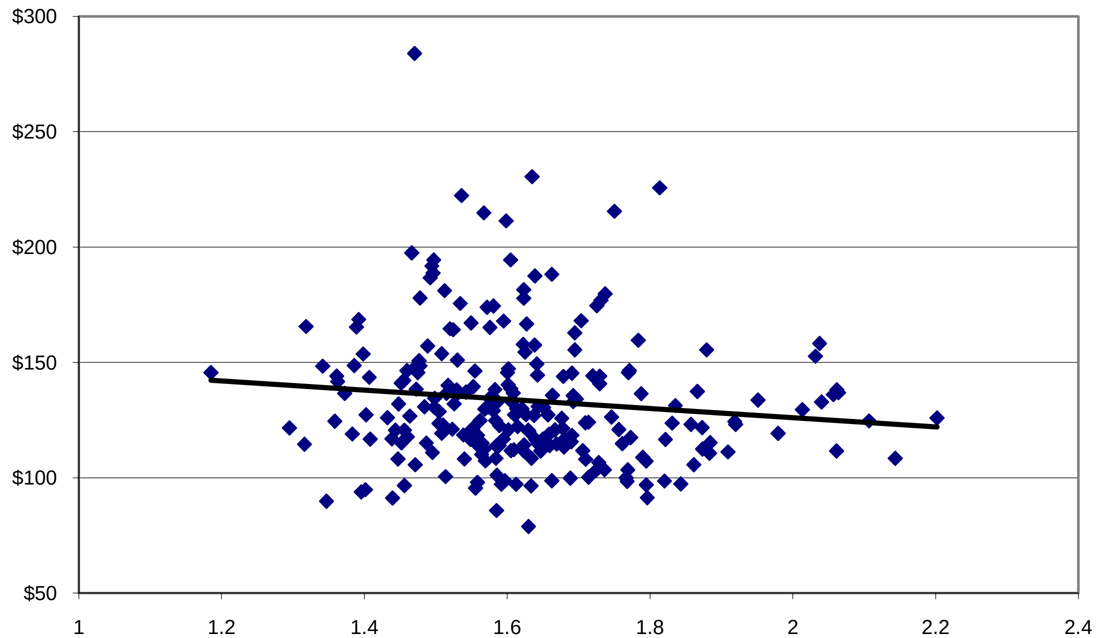

Figure 3. Children in Household and CMSA RENT/ROOM
Partial Regression Plot