A House or 2.5 kids? The New American Dream

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Abstract

This paper examines how changes in household wealth, driven by housing market fluctuations, influence fertility decisions. Using multi-decade data from the IPUMS between 1990 and 2024, I find that [placeholder for housing wealth fertility elasticity estimate]. I then build a life cycle model that demonstrates how rising house prices can delay the timing of first births, ultimately reducing overall fertility.

1 Introduction

The economics of fertility has long emphasized the relationship between household resources and reproductive behavior. Early empirical work documented a negative association between income and fertility, with Jones and Tertilt (2008) estimating a U.S. income elasticity of fertility of –0.38. Theoretical foundations for this relationship were laid by Becker (1960), Becker and Lewis (1964), and

Becker and Tomes (1976), who developed a model in which children are treated as durable normal goods. In this framework, the well-known quantity–quality trade-off generates a negative correlation between household income and fertility. Subsequent empirical studies, including Lindo (2010), Amialchuk (2006), and Black et al. (2015), provide further evidence that exogenous shocks to male income reduce fertility, reinforcing this perspective.

The Great Recession shifted attention to the role of household financial constraints in shaping macroeconomic outcomes. A central insight from this literature is that household balance sheets—particularly real estate equity—play a crucial role in driving consumption (Mian, Rao, and Sufi 2013; Mian and Sufi 2014). This raises an important question: beyond consumption, might real estate markets also influence other key household decisions, such as fertility? Figure 1 illustrates the co-movement of U.S. housing prices and birth rates, suggesting that house price fluctuations may be linked to fertility dynamics.

This paper asks three related questions. First, do changes in house prices causally affect fertility? Second, how do these effects differ in the short versus the long run? Third, what are the transmission mechanisms through which housing market shocks shape fertility choices? These questions are of particular importance given that both declining population growth and rising real estate valuations pose pressing challenges for advanced economies. Understanding the extent to which housing affordability interacts with family formation is therefore critical for designing effective policy.

A growing body of empirical research has begun to explore the connection between housing markets and fertility. Lovenheim and Mumford (2013) find that a $100,000 increase in housing wealth raises the probability of having a child by 16–18% among homeowners.

Kearney and Dettling (2014) document heterogeneous short-run effects, with house price increases boosting fertility for owners but depressing it for non-owners. More recently, Daysal, Lovenheim, Siersbaek, and Wasser (2021) use detailed Danish registry data to show that increases in home values significantly raise fertility among women of childbearing age. Taken together, this evidence highlights a robust but heterogeneous relationship between housing markets and fertility decisions.

Despite this progress, important gaps remain. Existing work largely focuses on reduced-form empirical estimates and lacks a unified theoretical framework to explain the underlying mechanisms. Moreover, because both house prices and fertility are trending macroeconomic variables, little is known about whether the sensitivity of fertility to housing market shocks has changed over time. Finally, much of the empirical literature exploits geographic variation in shocks, which combines partial equilibrium and general equilibrium effects, making it difficult to interpret the mechanisms at play.

This paper contributes to the literature in three ways. First, I apply a Bartik-style sensitivity instrument to estimate the causal effect of house prices on fertility. Second, I examine how the responsiveness of fertility to house price shocks has evolved over multiple decades. Third, I develop a novel partial equilibrium model that explicitly incorporates house price dynamics into fertility choice, thereby providing a structural interpretation of the mechanisms linking wealth fluctuations and demographic outcomes.

The remainder of this paper is organized as follows. Section 2 outlines the main data sources, while Section 3 details the empirical methodology and findings. Section 4 introduces the partial equilibrium model. Section 5 concludes.

2 Data

The primary fertility measures are drawn from the National Vital Statistics System (NVSS) natality files, which provide comprehensive microdata on U.S. births. Coverage varies over time: prior to 1972, the dataset includes a 50% sample of all birth certificates, while from 1972 to 1985, all birth certificates were collected for an expanding set of states, reaching nationwide coverage by 1985. The data include rich demographic variables—such as parental age, educational attainment, marital status, live-birth order, race, sex of the child, and geographic identifiers—as well as health information on birth weight, gestational length, prenatal care, attendant at birth, and Apgar scores. Geographic identifiers were available at the state, county, and city level (for cities above 250,000 before 1980 and above 100,000 thereafter), with additional SMSA and metropolitan/nonmetropolitan county designations. However, access to unrestricted geographic variables has been limited since 2005.

To construct population denominators and demographic covariates, I combine two sources. The National Center for Health Statistics provides county-level female population counts by age, race, and ethnicity, while the American Community Survey (ACS) contributes additional demographic information, including gender, religion, and educational attainment by county.

House price dynamics are measured using a set of widely used indices. The primary measure is the Freddie Mac House Price Index (HPI), which is based on loans purchased by Freddie Mac and Fannie Mae and is available at the MSA, state, and national levels from 1975 onward. This index is seasonally adjusted and has been widely used in the literature (e.g., Guren et al. 2020). For robustness, I also consider the Federal Housing Finance Agency (FHFA) HPI, which follows a similar construction and is likewise available from 1975, and the Case–Shiller HPI, which is available for selected metropolitan areas.

The final dataset is a county-by-year panel spanning 1995–2024, with annual frequency. Fertility rates are calculated as births per 1,000 women of childbearing age, matched to house price changes and a range of socioeconomic controls. Table 1 summarizes the key variables, their sources, and geographic aggregation.

Table 2 presents descriptive statistics on fertility and homeownership rates by maternal race for the period 1995–2023. Fertility rates are highest among Hispanic and American Indian/Alaska Native mothers, while White mothers exhibit the lowest fertility rates but the highest homeownership rates. By contrast, Black mothers have relatively high fertility but the lowest rates of homeownership. These differences highlight the heterogeneity across racial and ethnic groups in both demographic outcomes and exposure to housing market dynamics, motivating further analysis of heterogeneous treatment effects.

Descriptive Trends 1995-2024

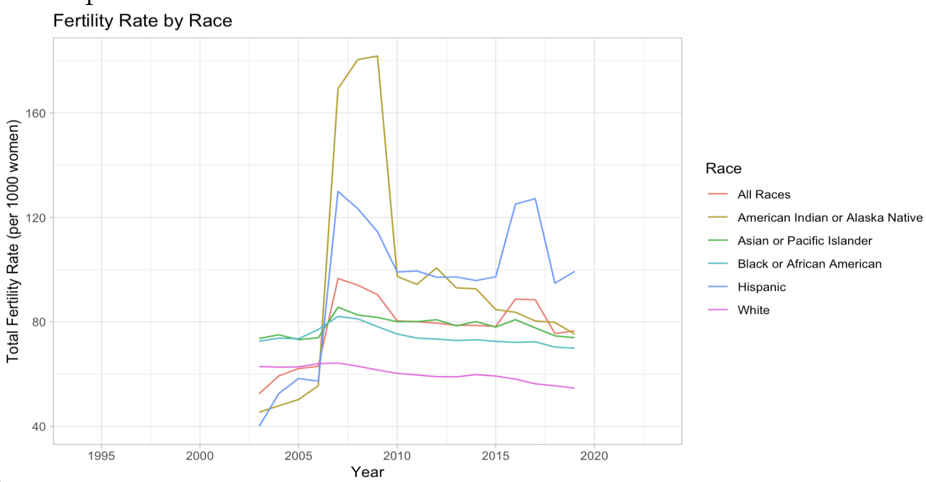

Table 1: Panel data from 1995-2024, time granularity: annual

Variable	**Description**	**Source**	**Geo**
Fertility Rate	Rate of birth per 1000 women	NVSS, NHS	county
ΔHouse Prices	Change in house price index at the MSA level scaled by 2000 median house price level	Freddie Mac and Census	County and CBSA
Ownership rate	Ownership rate by race and age group	Census	CBSA
Fraction College	Fraction of CBSA with college degree	Census	CBSA
Unemployment rate	Mean annual unemployment rates from Local Area Unemployment Statistics	BLS	County
Income per capita	Sum of all income divided by total population from Regional Economic Accounts	BEA	County
Average rent	Average fair market rent for 0-4 bedroom residences	DHUD	County
30 yr-mortgage rate	Average 30-year mortgage rate	Freddie Mac	CBSA
Medical costs	U.S. consumer price index: medical care services	BLS	National
Instrument	Regional cycle sensitivity Guren instrument	Guren et al. (2020)	CBSA
Saiz Instrument	Saiz land availability instrument	Saiz (2010)	CBSA

Race	Mean Fertility Rate (per 1000 women)	Mean Homeownership Rate (%)
American Indian or Alaska Native	80.0	53.7
Asian or Pacific Islander	78.2	56.8
Black or African American	74.3	45.1
Hispanic	85.5	61.5
White	60.1	73.6

Table 2: Summary Statistics by Mother's Race

3 Empirical Estimation

To estimate the effect of housing wealth on fertility, I adapt the empirical framework of **?**. The baseline regression specification is:

$$F_{sgt} = \beta_0 + \beta_1 \Delta P_{st} + \beta_2 \left(\Delta P_{st} \times O_{gt} \right) + \beta_3 O_{gt} + \vec{\gamma} X_{sgt} + \theta_s + \phi_t + \psi_g + \epsilon_{st}, \tag{1}$$

where s indexes Core Based Statistical Areas (CBSAs), t indexes years, and g indexes racial groups. The dependent variable F_{sgt} is the fertility rate, measured as the number of births per 1,000 women. The key explanatory variable ΔP_{st} measures log changes in the CBSA-level house price index. The interaction term $\Delta P_{st} \times O_{gt}$ captures the differential effect for homeowners, where O_{gt} is the homeownership rate for group g. The vector of controls X_{sgt} includes average income, unemployment rates, and mortgage rates.

In this specification, β_1 measures the effect of house price changes on fertility for non-homeowners, while β_2 captures the incremental effect for homeowners. Fixed effects θ_s, ϕ_t, and ψ_g absorb unobserved heterogeneity across space, time, and race groups, respectively.

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3.1 Addressing Endogeneity

A central concern is that fertility and house prices may be jointly determined by broader economic conditions. To address potential endogeneity, I employ a two-stage least squares (2SLS) estimation strategy.

The **first stage** links local house price changes to an instrument Z_{st}:

$$\Delta P_{st} = \pi_0 + \pi_1 Z_{st} + \theta_s + \phi_t + \nu_{st}, \tag{2}$$

where Z_{st} is an instrument that predicts plausibly exogenous variation in house prices.

The **second stage** substitutes the predicted house price changes into the fertility equation:

$$F_{sgt} = \beta_0 + \beta_1 \widehat{\Delta P_{st}} + \beta_2 \left(\widehat{\Delta P_{st}} \times O_{gt} \right) + \beta_3 O_{gt} + \overrightarrow{\gamma} X_{sgt} + \theta_s + \phi_t + \psi_g + \epsilon_{st}. \tag{3}$$

This approach isolates exogenous shifts in house prices, yielding causal estimates of the fertility response.

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3.2 Instruments for House Prices

Two instruments commonly used in the literature are considered.

- **Saiz (2010) Housing Supply Elasticity Instrument** – exploits geographic variation in land availability to predict housing supply constraints. This instrument has been widely used but loses predictive power after 2000.
- **Guren et al. (2020) Sensitivity Instrument** – exploits systematic differences across CBSAs in the responsiveness of local house prices to regional cycles. Local sensitivities $\hat{\gamma}_i$ are estimated from:

  $$\Delta p_{i,r,t} = \phi_i + \gamma_i \Delta P_{r,t} + \nu_{i,r,t}, \tag{4}$$

  and the instrument is then constructed as:

  $$Z_{i,r,t} = \hat{\gamma}_i \Delta P_{r,t}. \tag{5}$$

  This instrument explains up to 40% of variation in local house prices and is substantially stronger than the Saiz (2010) measure. I therefore use the Guren instrument as the primary instrument, with Saiz (2010) serving as a robustness check.

3.3 Control Variables

The regressions include a rich set of covariates to capture local economic and demographic conditions that may independently influence fertility. These include:

- the 30-year mortgage rate,

- CBSA-level unemployment rates,
- demographic composition (education, ethnicity, and religious affiliation), and
- income per capita.

3.4 Estimation Results

Table 3 presents OLS estimates alongside IV specifications using both the Guren and Saiz instruments. The OLS model suggests a modest positive interaction between house prices and homeownership, whereas the IV estimates yield substantially larger coefficients, consistent with attenuation bias in OLS from measurement error and simultaneity.

	OLS (1)	Guren Instrument (2)	Saiz Instrument (3)
$HousePrice_{t-1} \times OwnRate_{mg}$	0.0456***	0.0921***	0.0771***
	(0.00443)	(0.00448)	(0.00481)
$HousePrice_{t-1}$	-0.0091***	-0.0131***	-0.0117***
	(0.00130)	(0.00543)	(0.00921)
$OwnRate_{mg}$	-0.493***	-0.412***	-0.299***
	(0.0621)	(0.129)	(0.291)
R^2	0.8752	0.8543	0.8199
Number of MSAs	154	154	154
N	25,872	25,872	25,872

Table 3: Estimation Results 1995–2022

The main findings are:

- **House prices × ownership:** Positive and statistically significant across all specifications. Under the Guren instrument, a 1% increase in house prices raises fertility among homeowners by approximately 0.09 births per 1,000 women.

- **House prices (non-owners):** Negative, suggesting that rising housing costs reduce fertility for renters.
- **Homeownership rate:** Negatively correlated with fertility, reflecting composition effects across metropolitan areas.

The IV specifications yield R^2 values between 0.82 and 0.85, comparable to the OLS fit, but with stronger causal interpretation.

3.5 Dynamic Effects

To explore how the housing-fertility relationship evolved over time, I estimate rolling regressions across overlapping ten-year windows. Figure 1 plots the estimated interaction coefficient. The results suggest that the fertility response to housing wealth was strongest during the housing boom of the early 2000s and weakened significantly following the Great Recession.

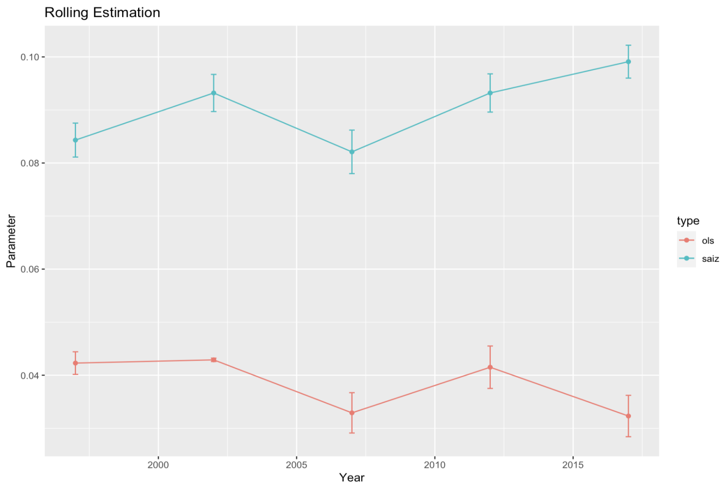

Figure 1: Rolling Estimates of House Prices × Ownership Effect, 1995–2022

These dynamic patterns highlight that the wealth–fertility relationship is not constant but shaped by macroeconomic conditions, underscoring the importance of considering both short-run and long-run responses.

4 Quantitative Model

4.1 A simple one-period model

To provide a theoretical framework for the empirical analysis, first let's consider a simple one-period household model of fertility and housing. In this setting, a household lives for one period, earns wage income w, consumes a non-housing good c_t, consumes housing services s_t, decides whether to purchase a house ($h_t \in \{0, 1\}$), and chooses the number of children n_t. Preferences are given by:

$$U_t = \log c_t + \alpha \log n_t, \tag{6}$$

where $\alpha > 0$ is the relative utility weight on children.

The household faces two constraints:

$$w_t(1 - \tau n_t) + \pi h_t = c_t + s_t \tag{7}$$

$$s_t = \gamma n_t + \underline{s}_t, \tag{8}$$

where τ denotes the opportunity cost of children in terms of forgone income, π represents the additional housing equity accessible to homeowners, γ captures the child-related housing cost per child, and $\underline{s}_t$ is the minimum baseline housing cost. The first constraint is the budget constraint, with homeowners able to consume housing equity πh_t. The second constraint reflects that housing services consist of a fixed component $\underline{s}_t$ and a variable component proportional to the number of children.

Solving the household's utility maximization problem yields the following closed-form expressions for optimal consumption and fertility:

$$c^* = \frac{w - \underline{s} + \pi h}{\alpha\left(1 + \frac{1}{\alpha}\right)} \tag{9}$$

$$n^* = \frac{w - \underline{s} + \pi h}{\alpha(\tau w + \gamma)}. \tag{10}$$

These solutions highlight the joint dependence of fertility and consumption on income, housing costs, and housing wealth appreciation.

The model delivers several straightforward comparative statics that link fertility choices to wages, housing costs, and housing wealth.

Result 1: Wages.

$$\frac{\partial n^*}{\partial w} = \frac{\alpha\gamma}{\alpha(\tau w + \gamma)^2} > 0. \tag{11}$$

An increase in wages raises fertility. Moreover, fertility of low-income households is more sensitive to wage increases than that of high-income households, since the marginal effect diminishes in w.

Result 2: Minimum Housing Costs.

$$\frac{\partial n^*}{\partial \underline{s}} = \frac{-1}{\alpha(\tau w + \gamma)} < 0. \tag{12}$$

An increase in baseline housing costs reduces fertility, with the effect strongest for low-income households.

Result 3: Housing Wealth. For homeowners ($h = 1$):

$$\frac{\partial n^*}{\partial \pi} = \frac{1}{\alpha(\tau w + \gamma)} > 0. \tag{13}$$

Increases in housing wealth appreciation encourage higher fertility among homeowners, again with a stronger effect for low-income households.

Calibration To discipline the model, I follow **?** and calibrate parameters across successive decades from 1950 to 2020, treating each decade as a separate generation. The calibration proceeds as follows:

1. Fit income distributions for each decade to a GB2 distribution.
2. Use observed homeownership rates θ to partition the population into renters and owners.

3. Compute total fertility as:

$$\int \frac{w - \underline{s} + \pi h}{\alpha(\tau w + \gamma)}\, dw.$$

Table 4 reports the parameter values used in the baseline calibration.

Parameter	**Meaning**	**Value**	**Source**
$\underline{s}$	Minimum lifetime housing cost (2000 dollars)	\$723,459	Calibrated
π	Average home equity appreciation (2000 dollars)	\$104,000	?
γ	Incremental fertility cost per unit housing	0.0014355	?
τ	Opportunity cost of time of children	0.125	?
α	Utility weight on children	0.23	?

Table 4: Calibration Parameters

Finally, Figure 2 plots the simulated fertility trends from the calibrated model alongside observed fertility trends, showing that the model captures both the long-run decline in fertility and the heterogeneous effects of housing markets.

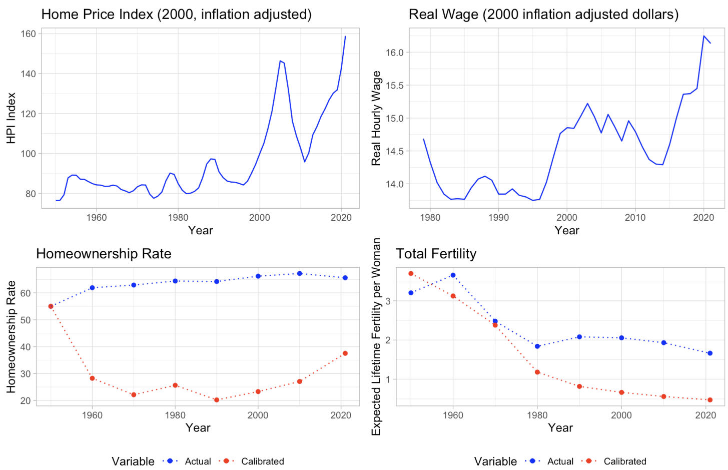

Figure 2: Model Calibration Results, 1950–2020

4.2 A Life Cycle Model

Consider a life cycle model where Households live from age 18 to 80 with certainty. In each period, they make decisions regarding consumption, savings, fertility, and investment in child quality. The household's choice set includes consumption $c_t \geq 0$, savings $A_{t+1} \geq 0$, the fraction of time allocated to child-rearing $l_t \geq 0$, and monetary inputs $x_t \geq 0$ into the production of children's quality, q_t. Fertility is determined by the decision to have an additional child, denoted $K_t \in \{0, 1\}$.

4.2.1 Homeowners

The problem for a homeowner is written as:

$$V_t(a_t, n_t, w_t, h_t) = \max_{c_t, a_{t+1}, x_t, l_t, K_t \in \{0,1\}} u(c_t, n_t, q_t, h_t) + \beta \mathbb{E}\left[V_{t+1}(a_{t+1}, n_{t+1}, w_{t+1}, h_{t+1})\right], \tag{14}$$

subject to the asset accumulation constraint:

$$A_{t+1} = \begin{cases} (1+r)\left(A_t + (1-l_t)w_t - c_t - x_t - m_t - (1-\psi^B)p_t h_t + (1-\psi^S)p_{t+1}h_t\right), & t \leq R, \\ (1+r)\left(A_t - c_t + w\right), & R < t \leq \end{cases} \tag{15}$$

the child quality production technology:

$$q_t = f(x_t, l_t, n_t), \qquad q_t \geq g \text{ if } n_t > 0, \tag{16}$$

and the stochastic fertility process:

$$n_{t+1} \sim \text{Bi}(n_t + K_t, p), \qquad n_{18} = 0. \tag{17}$$

The per-period mortgage cost is given by:

$$m_t = \frac{r_t^m (1 + r_t^m)^n}{(1 + r_t^m)^n - 1}, \tag{18}$$

and housing prices evolve with an idiosyncratic shock:

$$p_{t+1} = p_t \varepsilon_{t+1}. \tag{19}$$

4.2.2 Renters

The renter's problem is analogously defined as:

$$V_t(a_t, n_t, w_t, h_t) = \max_{c_t, a_{t+1}, x_t, l_t, K_t \in \{0,1\}} u(c_t, n_t, q_t, h_t) + \beta \mathbb{E}\left[V_{t+1}(a_{t+1}, n_{t+1}, w_{t+1}, h_{t+1})\right], \tag{20}$$

subject to the asset accumulation constraint:

$$A_{t+1} = \begin{cases} (1+r)\left(A_t + (1-l_t)w_t - c_t - x_t - \phi p_t h_t\right), & t \leq R, \\ (1+r)\left(A_t - c_t + w\right), & R < t \leq T, \end{cases} \tag{21}$$

the child quality production technology:

$$q_t = f(x_t, l_t, n_t), \qquad q_t \geq g \text{ if } n_t > 0, \tag{22}$$

and the stochastic fertility process:

$$n_{t+1} \sim \mathrm{Bi}(n_t + K_t, p), \qquad n_{18} = 0. \tag{23}$$

In the case of renters, the housing rental price is given by a ratio ϕ of the actual price. Utility is specified as:

$$U(c_t, n_t, q_t, h_t) = \frac{c_t^{1-\gamma}}{1-\gamma} + \eta \frac{(n_t q_t)^{1-\kappa}}{1-\kappa}. \tag{24}$$

In both cases, households face identical choices over consumption, savings, fertility, and child quality, but differ in their housing arrangements. Homeowners face mortgage costs and asset gains/losses from housing price fluctuations, while renters pay a flow rental cost proportional to market housing prices.

4.2.3 Preliminary Results

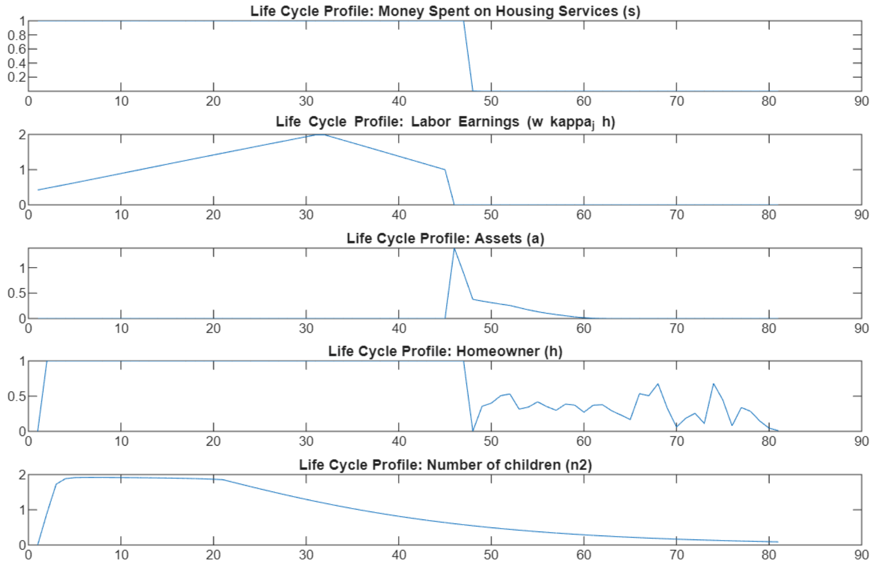

Figure 3: Life Cycle Profile

5 Conclusion

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