Intergenerational Persistence in Welfare Program Participation

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September 19, 2021

Abstract

Participation in social insurance (welfare) programs exhibits a significant persistence across generations. Children of welfare program participants are more likely to participate in these programs when they become adults, even after controlling for their income. This suggests some persistence in some underlying factors that affect the participation decisions of eligible households. While some eligible households in need might choose not to participate, other eligible households in better conditions benefit from welfare programs, limiting the effectiveness of these programs. To understand the source of this persistence and its implications on households and their children, we build a quantitative model overlapping generations with heterogeneous agents and incomplete markets. In the model, poor households may decide not to receive welfare transfers due to a utility cost from program participation. This cost depends on whether parents of a household had participated in welfare programs. Households also invest money and time in children's skills, which determine their labor-market ability as adults. The model is calibrated to the US data on welfare participation, income inequality, and intergenerational mobility from the 2000s. Using our calibrated model, we study how much of the persistence in welfare participation is due to the cost of participation and how this persistence affects parental investment in children. We find that around 20% of the intergenerational correlation in welfare participation can be explained by the transmission of the welfare culture across generations.

JEL Codes: E2, H2, I38.

Keywords: Welfare programs, intergenerational persistence, cultural transmission

We greatfully acknowledge Nezih Guner for advice and support throughout the project. We also thank Josep Pijoan-Mas, Pedro Mira, Matthias Kredler, and seminar participants at Macroeconomics Reading Group (CEMFI), PhD Workshop (CEMFI) and 2019 Simposyum of the Spanish Economic Association (SAEe) for helpful comments and suggestions. We also thank Christopher Rauh for his help with the estimates of our transfer function. Petit kindly acknowledges funding from Spain's Ministerio de Economía y Competitividad (Grants ECO2016-79848-P, BES-2017-082181 and María de Maeztu Programme for Units of Excellence in R&D, MDM-2016-0684). López Segovia gratefully acknowledges funding from the Fundación Ramón Areces and from Spain's Ministerio de Economía, Industria y Competitividad (María de Maeztu Programme for Units of Excellence in R&D, MDM-2016-0684).

1 Introduction

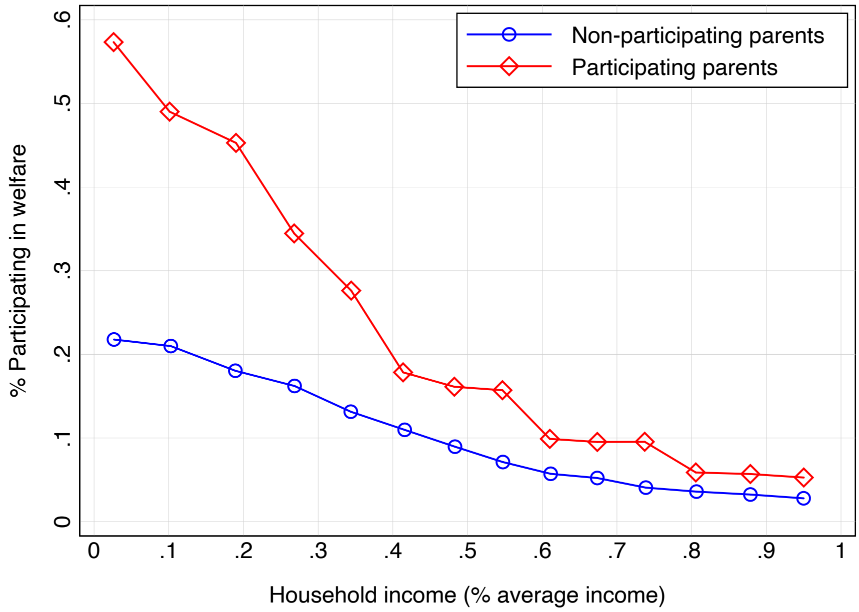
In the US and other high-income countries, individuals whose parents participated in social transfer programs are significantly more likely to participate in these programs when they become adults. At first glance, this should not be very surprising since children of poor households are more likely to be poor themselves and, thus, more likely to qualify for transfers. However, the persistence in program participation remains important even after controlling for parental income and other sociodemographic characteristics. This suggests some latent factors beyond income, making some eligible households not to participate that are passed from one generation to the next, what the literature calls "welfare culture." The evidence for welfare culture has been presented by Hartley, Lamarche, and Ziliak (2021) for the US, Dahl, Kostøl, and Mogstad (2014) for Norway, and by Dahl and Gielen (2021) for the Netherlands.

Another feature of welfare programs in the US is their relatively low take-up rates. In 2011, take-up rates ranged from 30% to 83% depending on the program (Ribar 2014). Several explanations have been suggested in the literature to rationalize the low take-up rates: social stigma (Moffitt 1983), lack of information (Finkelstein and Notowidigdo 2019), and transaction costs (Kleven and Kopczuk 2011). Indeed, the idea of some households "exploiting" the welfare system was one of the factors behind the 1996 Welfare Reform in the US which ended "welfare as we know it."[1]

This paper builds a model economy that can rationalize these two facts: intergenerational dependence on welfare programs and the low take-up rate. In the model economy, parents decide how much to work, how much to save, and whether to participate in welfare programs if they qualify. Parents invest time and money in their children's human capital, which determines how well they fare when they grow up. Finally, the model features a utility cost from program participation, capturing stigma, informational frictions and transaction costs. This utility cost is transmitted differently, through knowledge and values, to children depending on whether their parents participated in welfare programs.

[1] See Currie (2006) for a detailed discussion.

Figure 1: Participation in welfare programs by income



Note: Fraction of households participating in welfare programs as a function of household income for those whose parents never participated in welfare (blue line) and those whose parents participating at some point when they were at home (red line). Source: PSID: 2000-2009.

The intergenerational persistence in welfare participation and low take-up rates raises several questions: How do individuals decide whether or not to participate in welfare programs? How does "welfare culture" affect parental investments in children's skills? What is the intergenerational mobility? We use this framework as a quantitative laboratory to answer these questions.

Figure 1 depicts the fraction of households receiving welfare transfers as a function of their household income for those whose parents ever participated in welfare and those whose parents never did so. For the same level of income, households whose parents ever participated are much more likely to participate in welfare themselves. The impact of parental welfare participation is very significant at low levels of household income. For a household whose income is around 20% of the mean household income in the US (around \$20,000 in 2020), the parental participation more than doubles the probability that a household participates in welfare programs.

How would the intergenerational transmission of welfare culture affect who participates in welfare programs and intergenerational mobility? If the cost of program participation were independent and identically distributed across households, as it is usually assumed in the literature, only the poorest would participate in welfare. Suppose, instead, that the children of participating parents suffer a lower cost. Then, some of these poorest households may not participate in welfare, since their parents did not participate. On the other hand, other households with more resources might choose to be on welfare since their parents were participants. Furthermore, a household on welfare has lower incentives to invest in their children since parents know that the children can rely on welfare when they grow up. As a result, the transmission of welfare culture from generation to generation can reinforce existing differences between poor and rich households, generating welfare and poverty traps that reinforce each other.

Who does and does not benefit from welfare transfers and how government resources are spent have significant implications for the society. On the one hand, recent literature has highlighted the importance of early childhood development, and there is now a consensus that providing resources at the bottom of the income distribution has substantial benefits (see Heckman and Mosso 2014 for a review). On the other hand, welfare programs fail to reach many poor households. Hoynes and Schanzenbach (2018) document that over the past 20 years, an increasing share of welfare transfers is going to children near and above the poverty threshold, while a decreasing share is directed to the poorest children living below the poverty threshold. Today, about 16% of children live in poverty in the US, much higher than in other high-income countries. Furthermore, child poverty has been very persistent since 1980s, hovering around 15-20%, despite significant economic growth over this period.[2]

Our model features overlapping generations. Households in a generation differ in their skills. If they work, they accumulate human capital, and if they do not, their human capital depreciates. They also face idiosyncratic labor productivity shocks. Hence, some households in the economy start their adult life with better skills than others. Even households of the same initial level of skills have different earnings due to differences in labor force participation histories and luck. Households decide how much to consume, save and work. A child appears at a certain point in a household

[2] For U.S. poverty statistics, see Shrider, Kollar, Chen, and Semega (2021). The child poverty rate in Germany and France is about half of the U.S. level, while it is even lower in Scandinavian countries, see OECD Income Distribution Database, https://www.oecd.org/social/income-distribution-database.htm,KeyIndicators.

life-cycle, and altruistic parents decide how much money and time to invest in their children's skills. Investment in children determines the skill level of children when they become adults and leave the parental home.

If a household has income and assets below some thresholds, they qualify for government transfers and decide whether to participate in the programs or not. Participating in welfare, however, implies a utility cost. The utility cost is heterogeneous across individuals. Furthermore, we assume that if parents of an individual participated in welfare programs, she is more likely to draw a lower utility cost and, all else equal, more likely to participate in welfare programs. As a result, when parents decide whether to participate in welfare programs, they consider the potential effects on their children's future decisions.

We calibrate the key parameters of the model to US data for 2000-2010 using the Panel Study of Income Dynamics and the Child Development Supplement. We use the structure of the model to estimate the persistence in preferences as a residual after matching intergenerational persistence in income and welfare program participation. In the quantitative exercise, we focus on two major US welfare programs: the Temporary Assistance for Needy Families (TANF henceforth) and the Supplemental Nutrition Assistance Program (SNAP henceforth), formerly known as Food Stamps. Together these programs constitute about one-third of total non-health-related transfers to poor households.[3]

We then use the calibrated model to quantify the importance of the transmission of participation cost in the intergenerational correlation of welfare program participation. To this end, we simulate a counterfactual economy without the persistence in participation cost and recalibrate it to have the same number of program participants as in the baseline calibration. We then look at intergenerational correlation in welfare participation in these two economies. We find that around 20% of the intergenerational correlation in welfare participation can be explained by the intergenerational transmission of the welfare culture. The remaining 80% is accounted for the transmission of income between parents and children.

[3] In 2012, total federal spending on non-health-related transfers was \$316 billion, including TANF, SNAP, tax credits, housing assistance, and Pell Grants. The TANF and SNAP totaled \$97 billion. See Congressional Budget Office (2013).

1.1 Related Literature

This paper is related to three strands of the literature. First, it is related to the large empirical literature on the intergenerational persistence of welfare dependence. In their review of the literature, Black and Devereux (2011) note that while there is consensus on the strong intergenerational correlations on welfare participation, whether a causal relationship exists is less clear. Using data from the Aid of Families with Dependent Children (AFDC), the predecessor of the Temporary Assistance for Needy Families (TANF), Levine and Zimmerman (1996) find that this intergenerational correlation can be explained almost entirely by the intergenerational correlation in economic status. On the other hand, Gottschalk (1996) finds significant causal links between parents' and children's use of AFDC. More recent studies also support the idea of a welfare culture. In particular, Hartley et al. (2021), who exploit the welfare reform during the 1990s, find "strong evidence for a causal transmission of AFDC/TANF participation from mothers to daughters" (page 3). Dahl et al. (2014) and Dahl and Gielen (2021) also find evidence for welfare culture in the use of Disability Insurance programs in Norway and the Netherlands, respectively. Building on these empirical results, we build a quantitative model that can account for the main forces behind the joint transmission of economic status and welfare culture.

Our paper is also related to the literature on intergenerational transmission of economic status using dynamic economic models. Greenwood, Guner, and Knowles (2000) show that the increase in single motherhood since the 1960s can lead to intergenerational welfare dependence, as single mothers are more likely to be on welfare and their children do not fare well as adults. Several recent papers highlight the importance of parental background on children's lifetime economic outcomes and study the role of government policies. Some examples of this literature are del Boca, Flinn, and Wiswall (2016), Daruich (2018), Lee and Seshadri (2019), Petit (2019), Caucutt and Lochner (2020), and Daruich and Fernández (2020).[4] Within this literature, Mullins (2019) builds a structural model to study the effect of the

[4] Another strand of literature focuses on the effects of the welfare system on female labor supply and family formations, e.g., Blundell, Dias, Meghir, and Shaw (2016), Low, Meghir, Pistaferri, and Voena (2018).

design of welfare policies on maternal investment in children. However, none of these papers consider the intergenerational transmission of the welfare culture.[5]

Finally, our work is also related to the transmission of culture across generations. Bisin and Verdier (2001), Doepke and Zilibotti (2008), and Fernández-Villaverde, Greenwood, and Guner (2014) build models in which parents shape the preferences of their children. Fernández (2013) studies a model of culture learning to explain the increase in labor force participation over the second half of the 20th century. Our way of modeling cultural transmission is closer to the theoretical model built by Fernández, Fogli, and Olivetti (2004). In their model, husbands whose mothers participated in the labor market suffer a lower utility cost if their wives decide to work than the one suffered by those whose mother did not participate. In our model, individuals whose parents participated in welfare programs have, on average, a lower welfare participation cost, so, given their economic conditions, they are more prone to participate in welfare.

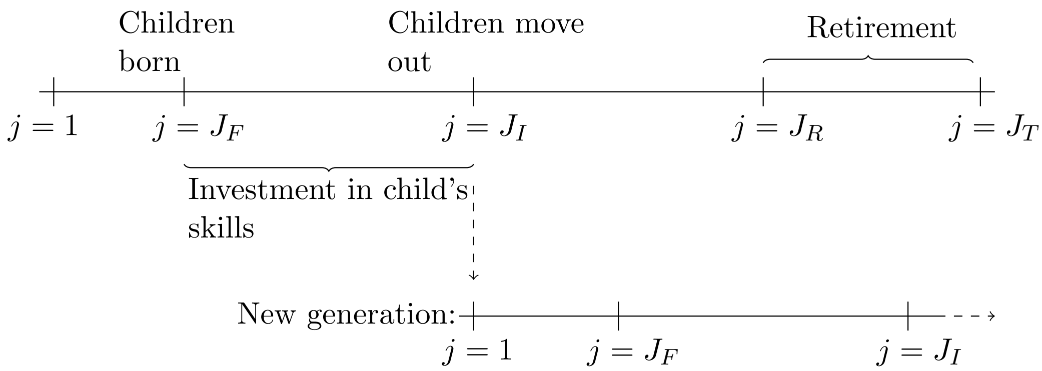
The paper is organized as follows. Section 2 provides a description of the model. Section 3 discusses the calibration. Section 4 presents the results. Finally, section 5 concludes.

2 Model economy

The economy is populated by a continuum of households who consume and work. Households are heterogeneous in terms of their age (j), skills (θ) and human capital (h). Households' skills are built during their childhood by parental investments in the form of time and money. During adulthood, human capital evolves endogenously depending on household's labor supply decisions over their life-cycle. There is a government that taxes household income and provides welfare transfers. Households who participate in welfare programs suffer a utility cost (sometimes called shame cost or welfare culture) that makes some eligible households not to participate. This cost is endogenously correlated across generations. In particular, households whose parents participated in welfare programs are more likely to have a low utility cost,

[5] There is also an extensive empirical literature on the long-term benefits of early-childhood education programs targeted at disadvantaged children, see, e.g., García, Heckman, Leaf, and Prados (2020), for a recent example.

Figure 2: Model's Life Cycle



Note: On the upper horizontal, the life cycle of a household is presented. At $j = 1$ a new household is formed who lives until J_T. At $j = J_F$, the household has children and at $j = J_I$ children move out of home and form a new household that starts a (new) life cycle, which is represented on the lower horizontal line.

making them more prone to participate as well.

Life-cycle Figure 2 represents the life cycle structure of the model. Households consume, save and decide whether to participate in welfare programs throughout their lives. Households also decide how much to work until they retire at age J_R. At age J_F a child is born, and households invest time and money on child's skills until age J_I, when the child moves out and forms a new household. Finally, at age J_T they die deterministically leaving no bequests. Finally, households can save on a risk-free asset at exogenous interest rate r. Borrowing is not allowed, so $a \geq 0$.

Preferences and utility cost from welfare participation Households derive utility from consumption and dislike working and participating in welfare. We denote by $\ell = \{0, 0.5, 1\}$ the labor supply choice, assumed to be discrete. $\ell = 0.5$ corresponds to part-time work (or PT) and $\ell = 1$ to full-time work (FT). Let $\mathbb{P} = \{0, 1\}$ be the participation choice. The utility function is

$$u(c, \ell, \mathbb{P}) \;=\; \frac{c^{1-\sigma}}{1-\sigma} \;-\; \varphi_{PT}\mathbb{I}_{\ell=0.5} \;-\; \varphi_{FT}\mathbb{I}_{\ell=1} - \mathbb{P}\nu \;, \tag{1}$$

where c stands for household consumption, ν is the utility cost from participating in welfare and φ_ℓ captures the disutility of work.

The utility cost from welfare program participation, ν, is realized at age $j = 1$

when the household is formed after moving out from parental home. For simplicity, we assume ν can take on two values $\nu \in \{\nu_0, \nu_1\}$, where $\nu_0 < \nu_1$. Households draw the value of ν from a distribution that depends on whether household's parent participated in welfare. Let $\mathbb{W}_p = \{0, 1\}$ take value one if household's parents participated in welfare while the household was at parental home, and 0 otherwise. Then, the probability of drawing the low utility cost is

$$P(\nu_0|\mathbb{W}_p = 0) = p_0, \quad P(\nu_0|\mathbb{W}_p = 1) = p_1, \tag{2}$$

with $p_1 > p_0 \geq 0$. This means that children of participating parents are more likely to draw a low utility cost from welfare participation, making them more likely to participate. We consider a symmetric transmission process so $p_0 = p_\nu$ and $p_1 = 1 - p_\nu$, with $p_\nu < 0.5$.

Child's skills formation Household's skills, θ, are fixed throughout their (adult) life-cycle and are realized at age 0 when the household is formed. Before moving out from parental home, skills evolve endogenously as a result of parental investments in the form of time and money. From the point of view of the parent, we denote children's skills by $\theta_k \in \mathbb{R}_+$. Following the literature on early child development (e.g. del Boca et al. 2014; Lee and Seshadri 2019), we assume a technology of skills formation that combines past skills and parental investments, and takes the following form

$$\theta'_k = \left[\mu\theta_k^\gamma + (1-\mu)I(m,t;\theta)^\gamma\right]^{\frac{1}{\gamma}} \exp(\epsilon), \quad \epsilon \sim N(0, \sigma_\epsilon^2), \tag{3}$$

where $I(m, t; \theta)$ is the investment function combining money (m) and time (t) that depends on parental skills, θ. The parameter γ controls the degree of dynamic complementarities in child's skills formation, and thus, drives the need to smooth parental investments over time. Following the literature on child's skill formation we add a random shock with zero mean and variance σ_ϵ^2. The investment function takes the following form

$$I(m,t;\theta) = \left[\alpha m^\xi + (1-\alpha)(e^{\psi\theta}t)^\xi\right]^{\frac{1}{\xi}}, \tag{4}$$

where α drives the relative role of money in building child's skills, ξ determines the degree of substitutability between time and money, and ψ determines the productivity of time investments for parents with different levels of skills. In order to start the process in equation 3, we assume that children are born without any skills. The first-period skills' level is given by $\log \theta_k = A_I \log I(m,t) + u$, where $u \sim N(0, \sigma_u^2)$ and $A_I > 0$.

Income Working-age household's income is given by $y = w\theta h\ell$, where w is the wage rate (exogenously fixed and normalized to 1), and h is the level of household's human capital. This human capital is accumulated over household's working life. In particular, next period's human capital for a household with human capital h, and who works ℓ hours is given by

$$h' = h(1-\delta) + g_\ell + z, \quad z \sim N(0, \sigma_z^2), \tag{5}$$

where $\delta \in [0,1)$ captures human capital depreciation, $g_\ell = \{g_0, g_{0.5}, g_1\}$ represents the returns to experience satisfying $g_{0.5} \leq g_1$. We normalize $g_0 = 0$ so that human capital of a household not working is expected to decrease by δh. Finally, the shock z is the only source of income uncertainty. Households begin with a level of human capital of $h = 1$.

Retirees receive pension benefits from the government that equals a fixed proportion $b_R \in [0,1]$ of last wage, so that total income is $y = w\theta h_{J_R} b_R$, where h_{J_R} is the level of human capital at the time of retirement.

Taxes The government collects income taxes through a progressive tax schedule, and uses these revenues to fund welfare. We consider a parametric function for the average tax rate that depends on income and the presence of children, widely used in the public finance literature (Benabou 2002, Heathcote, Storesletten, and Violante 2017). In particular, the average tax rate of a household with income y is

$$t(y,n) = 1 - \lambda(n) y^{-\tau(n)} \in [0,1], \tag{6}$$

where $n \in \{0,1\}$ indicates whether a child is present in the household, $\lambda(n)$ controls for the level of taxes, and $\tau(n)$ drives the degree of progressivity of the tax system.

Household's tax liability is then given by $T(y,n) = y \cdot t(y,n)$.

Transfers Similar to taxes, and following Guner, Rauh, and Ventura (2021), we consider a parametric transfer function that depends on income and the presence of children. In particular

$$TR(y,n) = \begin{cases} \gamma(n) & \text{if } \ y = 0 \\ \exp\{\beta_0(n) + \beta_1(n)y + \beta_2(n)\log(y)\} & \text{if } \ y > 0 \ , \end{cases} \tag{7}$$

where $\gamma(n)$ represents the amount of transfers received by households with zero income.

Households can receive welfare transfers if they meet some eligibility criteria. In particular, they can receive transfers as long as assets and income are below some thresholds, that is, if $a \leq \hat{a}(n)$ and $y \leq \hat{y}(n)$. The thresholds depend on whether there is a child at home or not ($n \in \{0,1\}$). In the analysis we include two welfare programs: Supplemental Nutrition Assistance Program (SNAP, former Food Stamps) and Temporary Assistance for Needy Families (TANF).

Social security Finally, there is a social security administration that runs its own budget. Households pay a fixed proportion τ_{ss} of their labor income as contributions while active–deductible from income taxes– and receive pensions when retired.

2.1 Household Decisions

Households with children at home While children are at home (ages $J_F \leq j \geq J_I$), parents make investments decisions for their children's skills (θ_k) on top of usual consumption, savings, work and welfare participation decisions.

Let's denote by $\mathbb{W} = \{0,1\}$ the history of household's participation in welfare while the child is at home. Then, the state vector of a household with children at home is given by $(j, h, \theta_k, \mathbb{W}, \theta, \nu)$, where (θ, ν), parents' skills and participation cost, are fixed. Their problem is:

$$V_j(h, \theta_k, \mathbb{W}; \theta, \nu) \ = \ \max_{c, a', \ell, \mathbb{P}, m, t} \ u(c, \ell, \mathbb{P}) - \phi t + \beta \mathbb{E}_j \left[V_{j+1}(h', \theta_k', \mathbb{W}'; \theta, \nu) \right], \ \ \forall j \in [J_F, J_I)$$

where ϕ is a linear cost of time investments, capturing the utility cost of forgone leisure. This problem is subject to $\ell \in \{0, 0.5, 1\}$, $\mathbb{P} \in \{0, 1\}$, $t \geq 0$, $m \geq 0$, and the following budget constraint

$$\begin{aligned} c + a' + m &= y + a - T(y, n = 1) + \mathbb{P} \cdot TR(y, n = 1), \\ y &= (1 - \tau_{ss}) wh\theta\ell + ra \end{aligned}$$

where θ'_k is given by equation (3), h' by equation (5), and $\mathbb{W}' = \max\{\mathbb{P}, \mathbb{W}\}$.

At the end of age $j = J_I$, children move out parental home. J_I is the last period the child is at home and corresponds to the last period that parents make investment decisions on their children's skills. The value function for the parent's problem, at this age, includes a new term, the continuation value of children V_1, that captures altruism. Note that the recursive formulation of the problem implies that the value of children is taken into account by parents in all the periods that the child is at home. Their problem is:

$$V_{J_I}(h, \theta_k, \mathbb{W}; \theta, \nu) = \max_{c, a', \ell, \mathbb{P}, m, t} u(c, \ell, \mathbb{P}) - \phi t + \beta \mathbb{E}_{J_I} \left[V_{J_I+1}(h'; \theta, \nu) \right] + \underbrace{\beta \mathbb{E}_{\nu_k} \left[V_1(1; \theta'_k, \nu_k) | \, \mathbb{W}' \right]}_{\text{Altruism}},$$

where the last expectation is taken over children's participation cost, ν_k, using the corresponding probability distribution $P(\nu|\mathbb{W})$.

Note that this formulation allows parents to internalize the effect of their participation choice on children's welfare. In particular, they know that if they participate in welfare, their children will suffer a lower utility cost (on average) if they decide to participate as well. They also internalize the effects of having a low participation cost on the returns to skills. For households with low participation cost, the welfare loss from a low income shock is lower as they can get income from transfers. Thus, parental incentives to invest in children's skills may be distorted.

Households without children at home In case children are not at home (ages $j < J_F$ or $j > J_I$), the only relevant state variables for the household are reduced to age, human capital, skills and welfare participation cost. Thus, the state vector of a household in this situation becomes $(j, h; \theta, \nu)$. Households without children at home choose how much to consume, save, work (only for those with age $j < J_R$) and whether to participate in welfare programs (if eligibility conditions are satisfied).

Their value function reads as:

$$V_j(h;\theta,\nu) \;=\; \max_{c,a',\ell,\mathbb{P}} \; u(c,\ell,\mathbb{P}) \;+\; \beta\mathbb{E}_j\left[V_{j+1}(h';\theta,\nu)\right], \quad \forall j \in [1,J_F) \cup (J_I,J]$$

with $c + a' = y + a - T(y, n = 1) + \mathbb{P} \cdot TR(y, n = 1)$. At age J_R households retire, their labor supply is zero, $\ell = 0$, and their income is $y = wh_{J_R}\theta b_R + ra$, where b_R is the replacement rate, defined as the ratio of pension income over labor income in the last period before retirement. At the end of age J_T, households die leaving no bequests $a'_T = 0$.

3 Calibration

We calibrate our model in two stages. In the first stage, some parameters can be directly estimated from household level data (those of taxes' and transfers' functions) and some others are taken from the literature and policy reports (interest rate, coefficient of relative risk aversion and eligibility thresholds). Then, we calibrate internally the remaining parameters so that our model replicates some key features of the US population regarding labor supply and welfare program participation.

The main data source used in this paper is the Panel Study of Income Dynamics (PSID hereafter). The PSID started in 1968 with a nationally representative sample of around 5,000 households, administered at the University of Michigan. Information of these households and their descendants has been collected over time. Among other things, it contains information on labor supply, income, welfare, program participation, wealth, childbearing histories and education. As children and grandchildren of original PSID families age, they become independent and form new households. These new households are included in subsequent waves, increasing the sample size every year, and allowing us to link information from different generations. In order to do so, we make use of the Family Identification Mapping System (FIMS hereafter). For each individual in the PSID, this dataset provides unique identifiers for her parents if they have ever been part of PSID.

Our baseline sample consists of individuals that are either heads of the household or spouses of the head, aged between 20 to 80, between the years 2000 and 2009. The restriction to this period is imposed in order to avoid reforms of the welfare system in the 1990s. This yields a sample of 16,974 individuals spanning a total of 118,551 individual-years observations.

The other important data source used is the Child Development Supplement (CDS). CDS is a research component of the PSID collected since 1997. It complements PSID with specific information on 0-12 year-old children and their parents. Among other things, it contains information on children intellectual abilities, time that parents spend with their children, money invested by parents, as well as demographic information about parents and children. We use the first three waves of CDS which were collected in 1997, 2003 and 2008. Among other things,

The model's period corresponds to three years, and critical periods (between brackets ages in real world) are: fertility age, $J_F = 3$ $(26 - 28)$, age at which children become independent $J_I = 9$ $(44 - 46)$, retirement age $J_R = 16$ $(65 - 67)$ and terminal age, everyone dies deterministically at age $J_T = 21$ $(78 - 80)$.

3.1 Parameters set a priori

Transfers We estimate the transfer function directly from the data using the Survey of Income and Program Participation (SIPP) from 2000 to 2009. We include in the analysis the Supplemental Nutrition Assistance Program (SNAP) and the Temporary Assistance for Needy Families (TANF). To simplify the model, we include a single participation choice in welfare programs for households and, if they decide to participate, receive transfers from those programs for which they are eligible to receive transfers. We allow the parameters of the transfer function $(\gamma, \beta_0, \beta_1, \beta_2)$ to differ whether there are children at home or not (and by welfare program). The transfer function is estimated using non-linear least squares separately for those households with zero and with two children at home.[6] Table 1 collects the transfer function parameters. The shapes of tranfer functions for SNAP (both with kids and no kids) and for TANF are shown in figure 3. Parameter estimates imply that households with children at home that have no income can receive transfers of around 15% of average income in the economy (about \$11,000 annually). Then, transfers decrease exponentially with income except for the case of SNAP with no

[6] Given that TANF requires the presence of children at home, we do not estimate the function for households without children.

Table 1: Parameters of the transfer function

	SNAP		TANF	
	$n=0$	$n=1$	$n=0$	$n=1$
γ	0.027	0.081	—	0.068
β_0	-3.299	-2.505	—	-2.979
β_1	-0.257	-0.929	—	-0.215
β_2	0.050	0.005	—	-0.046

Note: The table shows the parameters for the transfer functions in equation 7, by children presence at home ($n = 1$) or not ($n = 0$).
Source: SIPP, 2000-2009.

Table 2: Parameters of the tax function

	Level, λ	Progressivity, τ
$n=0$	0.865	0.070
$n=1$	0.924	0.112

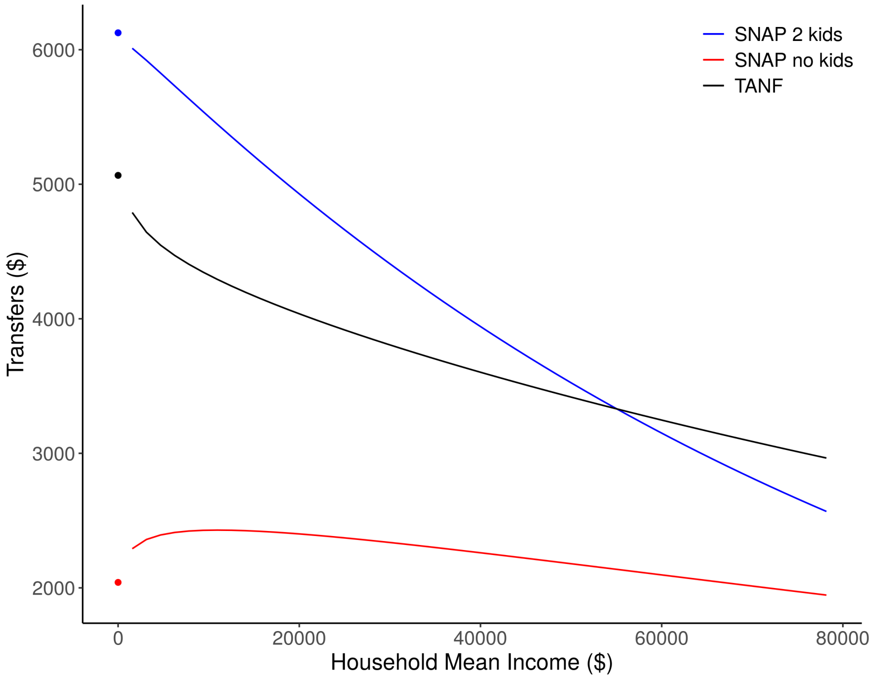
Note: The table shows the parameters for the tax function in equation 6, by children presence at home ($n = 1$) or not ($n = 0$).
Source: CPS, 2000-2009.

children at home. In that case, transfers can be slightly higher for small but positive incomes (than in the case with no income), but then transfers decrease with income.

Taxes Parameters for taxes are estimated from the Current Population Survey (CPS). Similar to tranfers, we allow parameters (λ, τ) to differ by the presence of children at home or not. Table 2 collects the tax function parameters, the shape of these tax functions is represented in figure 4. Estimates for λ imply that average tax rates tend to be lower for households with children than that for those households without children (except for very high incomes). For instance, a household with children around mean income (three times mean income) faces an average tax rate of 7.6% (18.3%), while those without children for the same level of income face an average tax rate of 13.5% (19.9%). We can also notice from figure 4 the higher progressivity in the tax system for those households with children (due to the higher τ for this type of households).

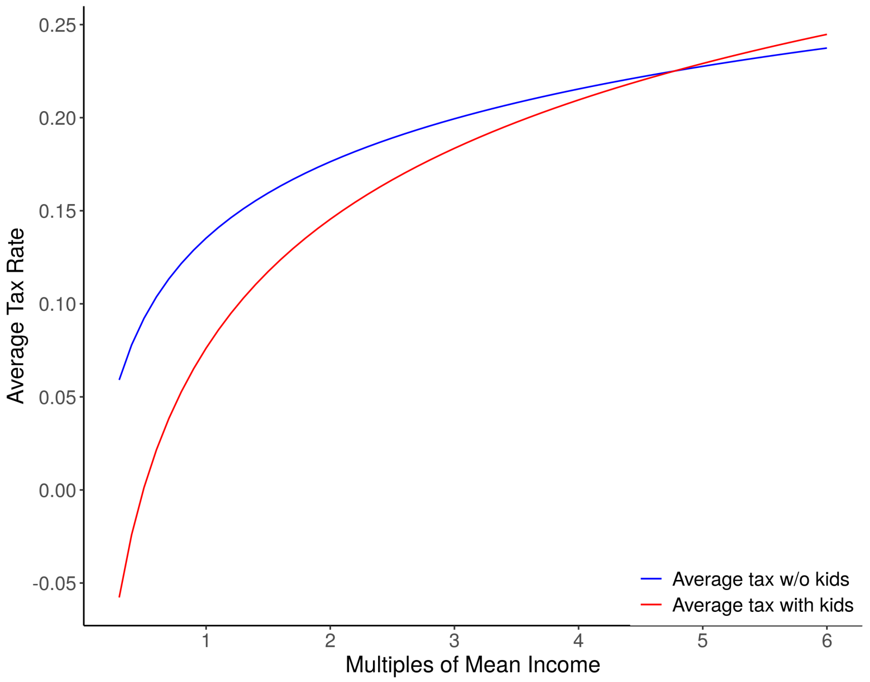
Eligibility conditions Eligibility conditions are taken for the year 2012, since data for TANF (which varies by state) is limited. Households can qualify for transfers if their income and assets are below some established thresholds. For SNAP, we

Figure 3: Estimated transfer functions: SNAP and TANF



Note: Amount of transfers as a function of income for each program. Since the function is estimated as a fraction of mean household income, we use mean family income in 2010 in the US (FRED data), which was $78,180, to transform them to dollars. The transfer function allows for a discontinuity at zero income.

Figure 4: Estimated tax functions



Note: Average tax rate as a function of income (as fraction of mean income) for households with children and households with no children. Except for high incomes, households with children face lower average tax rates. Higher progressivity of the system for households with children at home.

Table 3: Eligibility thresholds for transfer programs (annualized)

	SNAP		TANF	
	No kids	Kids	No kids	Kids
Income threshold	\$14,160	\$24,096	–	\$9,264
Asset threshold	\$2,000	\$2,000	–	\$2,000

Note: Thresholds taken for the year 2012. Since TANF requires the presence of children, households without children cannot participate. To use thresholds as model inputs, they are normalized by mean household income in the US.

obtain the income thresholds from the US Department of Agriculture. Households can qualify for SNAP benefits if their gross income is lower than 130% of the Federal Poverty Level (FPL).[7] They must also have assets below \$2,000 to be eligible for transfers, following Ortigueira and Siassi (2021). For TANF, we take eligibility thresholds from Falk (2014). Since these vary by state, we take the values from the median state, South Dakota. In South Dakota, households with gross income below 48% of FPL and assets lower than \$2,000 can qualify for TANF transfers. Table 3 collects the income and asset thresholds for SNAP and TANF.

Other parameters We set the interest rate, r, to 3% annual interest rate. β is set such that $\beta = 1/(1+r)$.[8] The curvature in the utility function is taken from Blundell et al. (2016) and Low et al. (2018) who use a similar utility function and set $\sigma = 1.5$. Replacement rate, b_R, for retirement income, is set to 50% of last wage (OECD, 2018).

3.2 Calibrated parameters

We are left with 16 parameters to calibrate internally: parameters for the disutility of labor and time investment in children $(\varphi_{PT}, \varphi_{FT}, \xi)$, shame cost transmission (ν_0, ν_1, p_ν), child skill formation $(\varsigma, \gamma, A_I, \psi_k, \sigma_q, \mu_k)$ and experience accumulation process $(\delta, g_{0.5}, g_{1.0}, \sigma_h)$. We calibrate them using the Simulated Method of Moments. In particular, let $\mathcal{P}$ be the vector of parameters to calibrate, $\mathcal{M}(\mathcal{P})$ the vector of

[7] The Federal Poverty Level is a measure of income used to determine eligibility for some programs. The Department of Health and Human Services updates it every year to account for inflation. The FPL increases with household size. Values for FPL are taken from the Office of the Assistant Secretary for Planning and Evaluation: `https://aspe.hhs.gov/2012-hhs-poverty-guidelines`

[8] The real lending interest rate between 2000 and 2015 was 2.91%, the World Development Indicators, the World Bank, `https://data.worldbank.org/indicator/FR.INR.RINR?locations=US`.

moments that generates the model with those parameters, and $\bar{\mathcal{M}}$ the vector of targets from the data. Then:

$$\mathcal{P}^* = \arg\min_{\mathcal{P}} (\mathcal{M}(\mathcal{P}) - \bar{\mathcal{M}})'(\mathcal{M}(\mathcal{P}) - \bar{\mathcal{M}}) \tag{8}$$

Moments selection

We consider four sets of targets. The first set includes targets on labor supply: share of individuals working part-time and full-time. The second set of targets is related to welfare participation: we include the fraction of eligible households that participate in welfare, fraction participating in welfare conditional on whether their parents ever participated in welfare. The third set is related to child investments: average time investment, average money investment, correlation time and money investment, standard deviation of skills and intergenerational correlation of skills. Finally, the last set of moments is related to the age-wage profile: we include average wages at age 35, age 50 and age 65, the coefficient of variation of log experience.

Identification

The parameters regarding the disutility of working are particularly relevant to match the first set of moments. φ_{PT} and φ_{FT} are relevant to capture the fraction of agents out of the labor force and working part-time. For the cost of participation in welfare, ν_0, ν_1 and p_ν helps the model to generate the fraction of eligible households that decide to participate in welfare and the fraction participating in welfare conditional on whether their parents ever participated. The disutility of time investment (ξ) is helpful to capture the average time investment seen in the data. Share of money in the investment function and sustitutability of time and money (ς and γ) are relevant to capture average money investment and the correlation between time and money investment in the data. Standard deviation of shocks (σ_q) helps to capture the standard deviation of skills and the Cobb-Douglas parameters (μ_k) is useful to capture the intergenerational correlation of skills. Finally, $g_{0.5}$ and $g_{1.0}$ help to capture wage growth during the life cycle, and δ captures the slowdown of wage growth at the end of the working life. σ_h is relevant to capture the inequality along the life cycle (coefficient of variation of log experience). Parameter values and targets are presented in table 4.

Table 4: Parameters and targets

Parameter		Value	Moment
Preferences			
φ_{PT}	Disutility work part-time	0.878	% working part-time
φ_{FT}	Disutility work full-time	1.768	% working full-time
ξ	Disutility time invest	3.320	Average time investment
ν_{high}	High shame cost	0.276	% of eligibles participating welfare
ν_{low}	Low shame cost	0.198	% participating welfare, partic parents
p_{ν}	prob. low cost partic.	0.675	% participating welfare, non partic parents
Child skills formation			
ς	Share money invest. function	0.334	Average money investment
γ	Substitutability time-money	-0.128	Corr(t, m)
ψ_k	Productivity time investment	0.060	Corr(t, θ)
σ_q	Standard deviation shocks	0.505	Standard deviation of skills
μ_k	Cobb-Douglas parameter	0.615	Intergenerational correlation skills
Experience accumulation			
δ	Depreciation rate	0.170	Age profile of experience
$g_{0.5}$	Accumulation rate for $\ell = 0.5$	0.218	Age profile of experience
$g_{1.0}$	Accumulation rate for $\ell = 1.0$	0.503	Age profile of experience
σ_h	Standard deviation of shocks	0.494	CV of (log) experience

Note: Calibrated parameters and the corresponding moments they target.

Model fit

Table 5 collects the moments included in the calibration algorithm and their data counterparts. The model does a good job in matching the moments related to participation in welfare. On the other hand, the model generates labor supply moments slightly lower than those of the data, especially for the share of full-time workers (57% in the model and 64.6% in the data). The model replicates well moments related to parental investments in children except for the correlation of time and money which is lower than that found in the data (0.683 in the model and 0.88 in the data). Finally, moments related to experience profile and inequality are fairly well replicated, although sligthly lower in the model than in the data. Figure 5 shows the experience profile generated by the model compared to the data. We can see that the hump-shape is fairly well captured, although from age 4 on, the profile generated by the model is slightly underestimated.

Non-targeted moments

To validate the predictions of our model, we look at a number of important moments that are not explictly included in our calibration algorithm. Table 6 shows the income thresholds for different percentiles of the income distribution generated by our model compared to that obtained from the data. Magnitudes are presented as a fraction of mean income in the economy. We can see that, overall, the model generates an income distribution that looks reasonable compared to the one in the data. However, the model generates less very poor people in the model than in the data (5% in the data do not have any income compared to just 1% generated by the model).

Finally, table 7 shows other non-targeted moments important for the model. The model captures quite well time investment by participation status, so participants invest less time in their children than those that do not participate in welfare programs. On the other hand, average skills of participants in the model is much lower than that of the data. That means that participants in our model are the poorest in the income distribution, while in the data there are some poor people that do not participate and others less poor that decide to participate in welfare programs. This might limit the magnitude of the results we might get for intergenerational mobility.

4 The Role of Welfare Culture

The main goal of the paper is to understand the welfare implications of the persistence in "shame" cost (cost from welfare program participation). The persistence makes shame cost not to be independent and identically distributed across households. Thus, the pool of program participants in the economy with persistent shame cost may be different from the one in an economy with iid costs, affecting the overall welfare evaluation of the programs and the incentives to invest in children's skills.

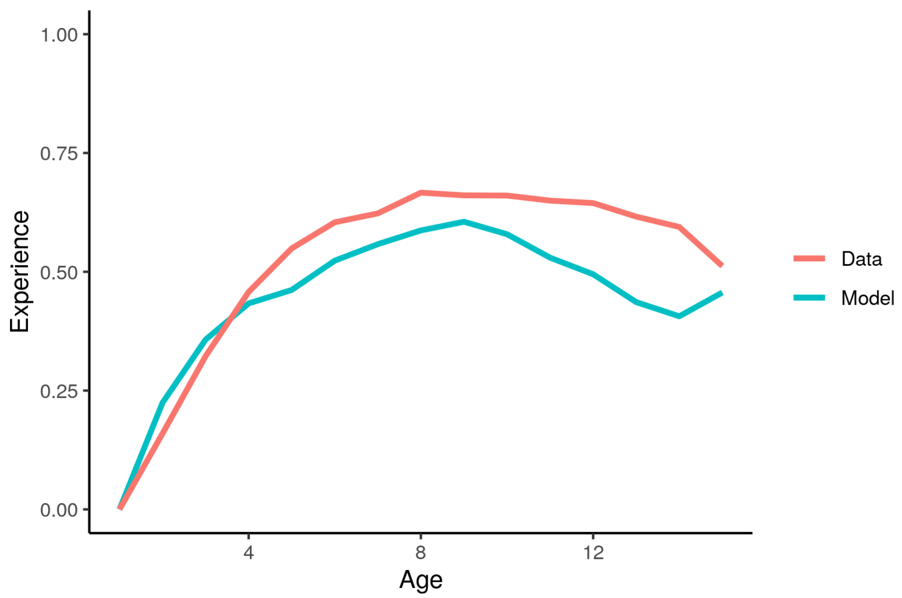
We first quantify how much of the differential in welfare participation rates between those whose parents participated and those whose parents did not is accounted for the intergenerational persistence in shame cost. Then, we ask how this persistence in "welfare culture" affects parental investment in children's skills.

Table 5: Model fit: Targeted Moments

Moment	**Model**	**Data**
Participation rate welfare (parents didn't participate)	0.059	0.061
Participation rate welfare (parents participate)	0.169	0.173
% of eligible that participate in welfare	0.806	0.833
Share of part-time workers	0.213	0.256
Share of full-time workers	0.570	0.646
Standard deviation of skills	0.755	0.772
Intergenerational correlation of skills	0.337	0.349
Average time investment	0.159	0.147
Average money investment	0.215	0.191
Correlation time and skills	0.164	0.154
Correlation time and money	0.683	0.880
Coefficient of variation log experience	0.898	0.860
Experience, age 5	0.462	0.549
Experience, age 10 - age 5	0.117	0.111
Experience, age 15 - age 10	-0.123	-0.149

Note: Targeted moments generated by the model and their data counterpart.

Figure 5: Experience profile, model and data



Note: Experience profile generated by the model compared to the data. Experience is normalized at zero at model age 1 for both profiles. Model age 1 corresponds to ages 20-22 in the data, model period corresponds to 3 years.

Table 6: Income distribution: thresholds for percentiles

	Model	Data
1st percentile	0.000	0.000
5th percentile	0.034	0.000
10th percentile	0.090	0.026
25th percentile	0.230	0.314
50th percentile	0.606	0.756
75th percentile	1.274	1.361
90th percentile	2.315	2.125
95th percentile	3.357	2.743
99th percentile	6.109	5.287

Note: Income distribution generated by the model compared to the data. Data taken from the PSID (2000-2009). Income distribution generated the model overall matches well the data, although less poor people is generated by the model.

Table 7: Non-targeted moments

	Participants		Non participants	
Moment	Model	Data	Model	Data
Share out of labor force	0.488	0.280	0.185	0.047
Average skills	-1.100	-0.540	0.121	0.053
Time investment	0.125	0.150	0.167	0.175

Note: Moments not targeted in the calibration that are important for the dynamics of welfare participation.

Table 8: Conditional distribution of utility cost, $Pr(\nu|\mathbb{W}_{parents})$

Benchmark

	$\mathbb{W}_{parents} = 1$	$\mathbb{W}_{parents} = 0$
ν_{low}	0.675	0.325
ν_{high}	0.325	0.675

Experiment

	$\mathbb{W}_{parents} = 1$	$\mathbb{W}_{parents} = 0$
ν_{low}	0.421	0.421
ν_{high}	0.579	0.579

Note: Distribution of utility cost for children of participants and non-participants for the benchmark economy and the experiment.

4.1 Intergenerational persistence in welfare participation

Understanding the source of intergenerational persistence in welfare program participation has important policy implications. If the transmission of welfare culture explains an important fraction of this correlation, expansion of welfare programs may create welfare traps and distort investment in children's skills. To quantify the relative importance of persistence in welfare culture accounting for the intergenerational correlation in welfare participation, we compare the difference in participation rate between those whose parents ever participated and those whose parents did not or, in mathematical terms, $Pr(\mathbb{P} = 1|\mathbb{W}_{parents} = 1) - Pr(\mathbb{P} = 1|\mathbb{W}_{parents} = 0)$ in the benchmark economy with that in an economy where all households draw the utility cost in welfare participation from the same aggregate distribution. Thus, we are removing the persistence in utility cost from participation (in the experiment it does not depend anymore on whether parents have participated or not), and, therefore, persistence in program participation is completely determined by persistence in economic status.

In table 8, we present the shame process for both the benchmark and the experiment. In the benchmark economy, those whose parents ever participated in welfare have a higher probability of having low shame cost than those whose parents did not, $Pr(\nu_0|\mathbb{W} = 1) = 0.675 > 0.325 = Pr(\nu_0|\mathbb{W} = 0)$, while in the experiment both probabilities are the same and equal to 0.421.

We find that $Pr(\mathbb{P} = 1|\mathbb{W}_{parents} = 1) - Pr(\mathbb{P} = 1|\mathbb{W}_{parents} = 0)$ falls from 11 percentage points (p.p. hereafter) in the benchmark economy to 8.6p.p. Therefore, intergenerational transmission of shame cost accounts for around 20% of total intergenerational correlation in welfare program participation.

4.2 Intergenerational persistence of skills (preliminary)

What's the impact of persistence in shame cost in the intergenerational persistence of skills? Removing persistence in shame cost decreases intergenerational correlation of skills from 0.337 to 0.333, that is a 1.2%. Time investment decreases by around 1% (from 0.125 to 0.124). The fall in intergenerational correlation of skills and time investment is a moderate one. The main reason is related to the feature highlighted in the non-targeted moments section of the calibration part: participants in our benchmark economy are very poor (much poorer than participants in the data), and this makes that the pool of participants changes little when we remove persistence in shame cost. In other words, in the experiment only the poorest should participate, but that's already happening in the benchmark. The main work is to get a realistic benchmark in which some of the poorest decide not to participate and some less poor do participate. There, this second group should see a higher distortion of welfare culture than the poorest ones (since these are already decision constrained in any case) in the benchmark economy and, thus, get more implications for intergenerational persistence of skills.

5 Conclusions

In the US, individuals whose parents participated in welfare programs are almost three times more likely to participate in welfare than those whose parents did not. This correlation combines two sources of intergenerational persistence: economic status and welfare culture. We have built a partial equilibrium life cycle model with overlapping generations, incomplete markets, experience accumulation and parental investments in children's skills to quantify the relative importance of these two sources, and to better understand the role of welfare culture transmission in intergenerational persistence of economic status. We calibrate the main parameters so that the model replicates some key features of the data regarding labor supply, welfare program participation and parental investments in children's skills.

Using the calibrated model as a laboratory economy, we find that around 20% of the intergenerational persistence in welfare participation can be explained by the welfare culture transmission channel, while the other 80% is accounted for the transmission of income between parents and children.

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