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The Great Gatsby Curve

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Abstract

This paper provides a synthesis of theoretical and empirical work on the Great Gatsby Curve, the positive empirical relationship between cross-sectional income inequality, and persistence of income across generations. We present statistical models of income dynamics that mechanically give rise to the relationship between inequality and mobility. Five distinct classes of theories are developed, including models on family investments, skills, social influences, political economy, and aspirations, each providing a behavioral mechanism to explain the relationship. Finally, we review empirical studies that provide evidence of the curve for a range of contexts and socioeconomic outcomes as well as explore evidence on mechanisms.

1. INTRODUCTION

One of the most visible stylized facts in contemporary inequality research is the association, across national economies, between measures of cross-sectional income inequality and intergenerational mobility or persistence. At the cross-country level, this relationship was recognized early by Hassler et al. (2007), Andrews & Leigh (2009), Björklund & Jäntti (2009), and Corak (2006; 2013a,b), whose work has received particular attention. **Figure 1** illustrates the relationship, which describes a positive association between inequality, measured by a country's Gini coefficient, and persistence, measured by the intergenerational elasticity of income (IGE)[1] linking parent and offspring permanent incomes. Based on Corak's (2013b) work, Krueger (2012) dubbed the positive relationship between inequality and persistence the Great Gatsby Curve (GGC) and introduced it into popular and policy discussion.

The prominence of the curve in policy debates derives from several reasons. First, it suggests that a society can simultaneously pursue equality of outcomes (measured by cross-sectional differences) and equality of opportunity (measured by mobility). Second, and specific to the American context, the curve challenged the longstanding idea that the United States has, in contrast to other societies, made choices on socioeconomic structure that accept unequal outcomes in order to produce equal opportunities; that is, Americans believe in the proverbial American Dream. Longstanding social science traditions have argued that this view of opportunity is integral to the American character. For example, Potter's (1954) classic discussion of how American abundance created a distinct national character is based on the idea that America offered qualitatively greater

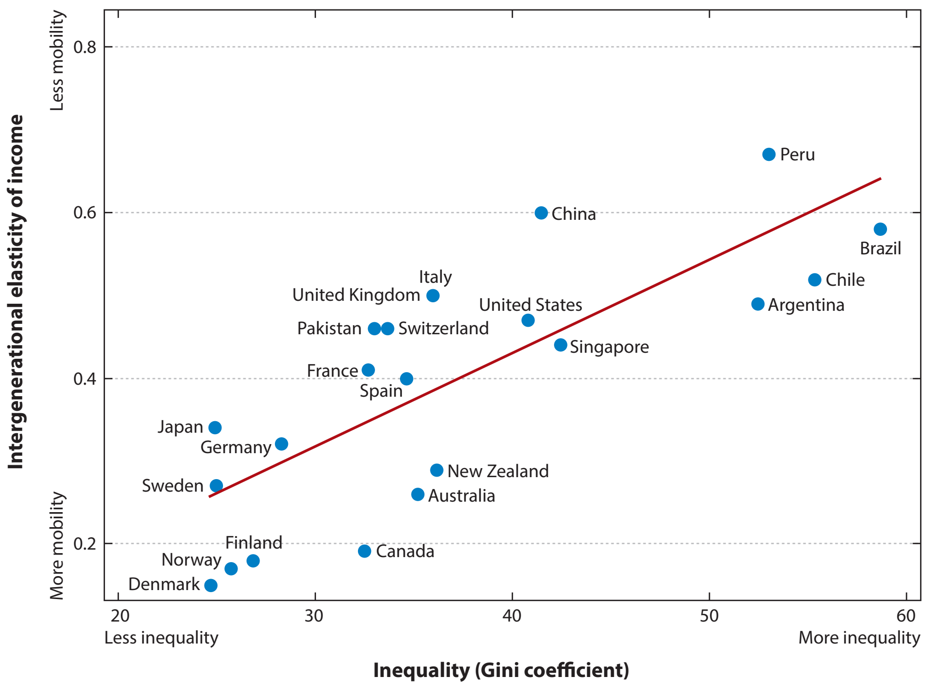

Figure 1

The Great Gatsby Curve. Figure adapted from **https://milescorak.com/2012/01/12/here-is-the-source-for-the-great-gatsby-curve-in-the-alan-krueger-speech-at-the-center-for-american-progress/**.

[1]The IGE is defined by Equation 1 below.

socioeconomic opportunities than did Europe, at least for white males. Lipset (1996) argues that an important dimension of American exceptionalism is a commitment to meritocracy, which is intertwined with the belief that America offers ample opportunities that are not determined by family background. Fischer (2010, p. 10, emphasis in original) suggests that a key feature of the American character is voluntarism, which is described by the following:

> The first key element of voluntarism is believing and behaving *as if* each person is a sovereign individual, unique, independent, self-reliant, self-governing, and ultimately self-responsible. . .The second key element is believing and behaving *as if* individuals succeed through fellowship. . .in sustaining voluntary communities. . .In a voluntaristic culture people assume that they control their own fates and are responsible for themselves.

Since the GGC links inequality to limits in opportunity and thus to the control of one's fate, it has been popularly regarded as a challenge to American national myths.

The GGC also has normative implications. Much modern thought on equality of opportunity and justice focuses on the role of individual responsibility in distinguishing just versus unjust inequalities. Cohen (1989, p. 907) famously argues that justice demands equal access to advantage, where "advantage" is understood to include, but to be wider than, welfare. Under equal access to advantage, the fundamental distinction for an egalitarian is between choice and luck in the shaping of people's fates. Roemer (1993, 1998) elaborates on this approach and provides ways to operationalize this form of just opportunity. Since parental socioeconomic status is an obvious case of something for which children are not responsible, the extent to which inequality induces intergenerational persistence means that cross-sectional inequality leads to injustices. To the extent that intergenerational persistence generates cross-sectional inequality, this inequality would therefore derive from unjust mechanisms.[2]

The GGC has generated much research. On the theory side, the search for mechanisms to explain the curve has involved understanding what sorts of socioeconomic environments can produce a GGC within a given country across time. The theoretical approaches have usually treated the level of persistence in socioeconomic status as deriving from the level of inequality in a given society. It is fair to say that many of the theories that have been developed to explain the GGC are in many cases based on earlier generations of intergenerational mobility models, where the possibility of such a relationship was present but not recognized. The empirical side of research has been diffuse. Some work has attempted to identify GGC-like behavior for a range of spatial and temporal contexts, while other work has attempted to identify evidence for the mechanisms proposed by various theories.

In this synthesis of research on the GGC, we proceed in four stages. In Section 2, we discuss the GGC from the perspective of the intrinsic links between inequality and persistence that necessarily exist when one considers each as a feature of the stochastic process for income dynamics that links generations. Section 3 considers behavioral models of the GGC, with emphasis on the distinct roles of families, social environment, political economy, and the psychology of aspirations in producing positive associations between inequality and persistence. Section 4 discusses findings

[2]The logic of responsibility-sensitive egalitarianism must be adjudicated against other social goods before drawing clear ethical conclusions. One clear issue involves the intrinsic value of family relations and the importance of allowing parents to flourish via their effects on their children. Brighouse & Swift (2006, 2014) and Lazenby (2010) discuss these trade-offs. Cohen (2009) argues that socialist equality of opportunity requires equalizing the effects of genes as well as social disadvantage, whereas left-liberal equality of opportunity focuses on the latter. Roemer (2010) argues that this also requires addressing inequalities generated by values and aspirations for which a person is not reasonably responsible. As Roemer (1993) argues, the political process should determine how to adjudicate these trade-offs.

on the GGC across different locations, times, and socioeconomic outcomes as well as evidence on mechanisms. Section 5 concludes.

DiPrete (2020) has written an *Annual Review of Sociology* article on the relationship between inequality and mobility that should be read in conjunction with this review. DiPrete gives a sociologist's perspective while paying careful attention to the economics literature. We hope we have shown the same sensitivity to sociological work in writing from an economist's perspective.

2. THE MECHANICS OF THE GREAT GATSBY CURVE

In this section, we discuss the GGC as a mathematical regularity. By this, we mean that relationships exist between inequality and persistence that derive from mathematical reasons from models of income dynamics and so these must be considered when thinking about the interpretation of any empirical GGC. Blume et al. (2022) discuss general issues; here, we identify basic ideas.

Consider any stochastic process for family income. Denoting the logarithm of income of a parent in family i in generation t as y_{it},[3] the statistics of intergenerational mobility for family dynasties may be understood as derivative from the conditional probability density function relating parental and offspring income:

$$\mu\left(y_{it+1}\,|\,y_{it}\right). \tag{1}$$

If this process applies to all families, then given an initial marginal density μ_0 for incomes in the population, one can trace out the dynamics for cross-sectional densities at each t. Calculations of measures of cross-sectional inequality and degrees of intergenerational mobility are simply statistics generated by the stochastic process and the initial incomes in the population. As such, there is a mathematical relationship between these statistics that derives from the fact that they are functions of Equation 1 and initial conditions. This conditional probability exists, of course, even if the behavioral model of family income is not Markov; e.g., the incomes of grandparents matter for the incomes of their grandchildren, or the incomes of offspring depend on variables other than parental income, and so on.

2.1. Linear Models

It has been long understood that a mathematical relationship between inequality and mobility is embedded in the standard empirical model of intergenerational mobility. Here we focus on the relationship between the variance of income and persistence across generations.[4] The classic intergenerational mobility regression does not focus on Equation 1 but rather considers the linear projection of offspring income on parental income

$$y_{it+1} = \alpha + \beta y_{it} + \varepsilon_{it}. \tag{2}$$

The coefficient β is the IGE and the statistic conventionally used to measure intergenerational mobility.[5] Since

$$\mathrm{var}(y_{it+1}) = \beta^2\mathrm{var}(y_{it}) + \mathrm{var}(\varepsilon_{it}), \tag{3}$$

[3] While we usually treat income relationships as involving logarithmic forms, this assumption is not innocuous in practice. Grusky & Mitnik (2020) argue that the conventional use of log income has consequences because of the way low– versus high–parental income values are weighted in mobility estimation and that income levels should be used. For our purposes, the log/level distinction is inessential.

[4] Berman (2019) develops the analogous relationship between the Gini coefficient and the IGE.

[5] Much contemporary work on mobility focuses on relative mobility, so that regressions of the form given in Equation 2 are conducted using parental and offspring ranks in the income distribution. Our arguments about the IGE apply a fortiori to ranks since they constitute a nonlinear transformation of incomes, one that depends on the entire income distribution.

one has a mechanical relationship between contemporary persistence β and future cross-sectional inequality, $\mathrm{var}(y_{it+1})$. Further, if $|\beta| < 1$, ε_{it} is stationary with common finite variance, then the steady-state variance will obey

$$\mathrm{var}(y) = \frac{\mathrm{var}(\varepsilon)}{1 - \beta^2}. \tag{4}$$

Together, the transition dynamics in Equation 3 and the steady-state relationship in Equation 4 produce two ways in which the variance of income and persistence of income are mathematically linked.

What is the importance of these mechanical relationships between cross-sectional inequality, as measured by the variance of offspring income, and persistence, as measured by the projection coefficient of offspring income on parental income? One implication is that, for linear models, the causality between the factors in the GGC runs from inequality to persistence. For the linear model, increases in β will cause increases in the variance of incomes in the next generation, but there is no relationship between the variance of current incomes and the level of β. The direction of the relationship is intuitive: Persistence means that the effects of parental income on offspring income are large so that the variance of this component adds to the variance of offspring income. In this sense, Equation 2 can provide interpretable evidence in terms of theories that focus on how persistence affects the level of inequality. In contrast, if one wishes to understand how inequality creates persistence, then one needs to think about the statistical model given in Equation 2 differently.

Berman (2019) provides a systematic exploration of the extent to which the mechanical relationship between the IGE and cross-section inequality measures can explain GGC evidence, finding that nearly two-thirds of country-level cross-section IGE variation can be explained by the mathematical relationship embedded in the linear mobility regression using the Gini coefficient as a measure of inequality. He finds that that the mechanical relationship also explains over 90% of the temporal variation in the US IGE reported by Davis & Mazumder (2022).

2.2. Nonlinearity

If one wishes to argue that changes in inequality generate changes in persistence, then it is necessary to interpret Equation 2 as a statistical rather than structural relationship. This observation led Durlauf & Seshadri (2018) to argue that interpreting GGC-type relationships as deriving from mechanisms for which inequality generates persistence requires reconceptualizing Equation 2 as a misspecification relative to the richer model

$$y_{it+1} = \alpha + \psi(x_{it})y_{it} + \eta_{it}, \tag{5}$$

where x_{it} is some set of variables that are correlated with y_{it} and η_{it} is a martingale difference process.[6] Equation 5 implies that the β produced in the linear projection given in Equation 2 can vary according to the distribution of y_{it}. This relationship is made explicit in White's (1980) classic analysis of least squares as an approximation to nonlinear models, and the associated formula that describes the population value of β for the misspecified model in Equation 2 relative to that in Equation 5 is

$$\beta = \frac{\int y_{it}^2 \psi(x_{it})\, \mu(x_{it}, y_{it})\, dxdy}{\mathrm{var}(y_{it})}, \tag{6}$$

[6]Theoretical models of poverty traps, for example, typically lead to specifications such that the intercept also depends on covariates, i.e., the intercept should be $\alpha(x_{it})$.

where $\mu(x_{it}, y_{it})$ is the joint probability density over x_{it} and y_{it}. In this way, different variances of income may be associated with different β estimates.

Equation 6 indicates how the GGC can be generated by understanding how linear approximations of β do not logically entail a positive relationship between β and any specific measure of cross-sectional inequality, be it variance, Gini coefficient, or another statistic. The type of nonlinearity matters. The development of theoretical models of the GGC provides ways to understand what types of nonlinearities can generate the curve.

2.3. Markov Chains

These ideas have analogs if one considers Markov chain representations of mobility dynamics so that the cross-sectional density of income μ_t evolves according to

$$\mu_t = P\mu_{t-1}, \quad 7.$$

where P is the Markov transition matrix. As in the case of the linear model, to the extent that intergenerational mobility measures are functions of P, it then means that such mobility measures are invariant with respect to changes in μ_t.[7] Hence the Markov chain approach to the GGC can be subjected to the same causal logic as developed for the linear model in terms of both the inequality/mobility link along transitions to the invariant measure and the inequality/mobility link at the invariant measure.

Further, following the logic that related Equation 2 and Equation 5, if transition matrices are the determinants of mobility, then, in order for inequality to affect mobility, it is necessary that the transition matrix can change. One way this can occur is if the transition probabilities depend on the cross-sectional density. Conlisk (1976) develops a set of interactive Markov chain models with time-varying transition matrices that do exactly this:

$$P_t = \Psi(\mu_t), \quad 8.$$

where $\Psi(\cdot)$ is the mapping from the time t income density to the transition probabilities. This is one route to producing a Markov chain analog to Equation 5.

An approach such as that of Conlisk explicitly allows the conditional probabilities for each child to depend on the full distribution of adults' incomes. As such, it is an example of a richer initial formulation in which Markovian structure linking incomes across generations is a relationship for the full vector of incomes y_t and future individual incomes; in other words, Equation 1 is an approximation of a richer family-level dynamic:

$$\mu\left(y_{it+1} \,\middle|\, y_{it}, y_{-it}\right), \quad 9.$$

where y_{-it} denotes time t incomes other than that of family i. This dependence is more general than Equation 8 both by relaxing the Markov chain assumption and because the identities of others can matter, as occurs in a social network, as the distribution of others' incomes may not be a sufficient statistic. From this perspective, time mobility statistics generated by Equation 1 depend on the distribution of incomes at time t. Hence the logic we have described concerning the relationship between Equation 2 and the White approximation in Equation 6 apply to any statistic based on Equation 1 where Equation 9 is the correct model. Equation 9 is appropriate given many of the theories of the GGC because of the role of general equilibrium effects of various types in linking cross-sectional inequality to mobility. It is also appropriate when families care about the relative

[7]For example, many Markov chain mobility measures are functions of the eigenvalues of P, as discussed in Sommers & Conlisk (1979).

status of their children, which of course means that parental investments depend on the choices of others.

To be clear, the fact that measures of inequality and measures of mobility derive from a common stochastic process does not render the evidence of a GGC uninteresting. First, it is not the case that measures of inequality and mobility must necessarily exhibit positive dependence; hence the empirical fact could have been false. Second, socioeconomic mechanisms are needed to understand why the stochastic process takes the form it does, that is, why the relationship is positive.

A final issue is the potential sensitivity of claims regarding the GGC to the choices of statistics to describe inequality and mobility. It has been long understood that standard inequality measures such as the Gini coefficient versus the variance of log income are not monotonic transformations. Similarly, persistence statistics, be they IGE or measures of the probabilities of upward or downward mobility, need not be monotonically related to one another. Amaral et al. (2019) are unique in exploring the robustness of Gatsby curves across times, locations, and measures. Interestingly, they find that the raw correlation of inequality and mobility holds across times and locations when the Gini coefficient is used to measure inequality, while if controls of time and location effects are included, the share of the 1% appears more robustly associated with mobility than the Gini coefficient. See also Jenkins (2022), who shows how claims about trends in UK inequality can change according to inequality and mobility measures.

3. THEORIES OF THE GREAT GATSBY CURVE

In this section, we describe five classes of theories that provide mechanisms to explain the GGC that we believe give insights into the mechanisms that can map greater inequality to greater persistence of outcomes across generations. We organize the discussion along lines similar to those found in Durlauf & Seshadri (2018), augmenting it with political economy considerations following Bénabou (2018) as well as an important psychological dimension. We emphasize that these theories are not in competition; that is, the theories are all open ended in the sense of Brock & Durlauf (2001): The validity and applicability of one theory does not speak to the validity and applicability of another.

In evaluating these theories, it is important to recognize that they typically involve inequality in factors beyond family income, ranging from family structure, parental educational, and occupational attainment to inequalities in social influences and public goods creation. This is another way to understand the importance of regarding bivariate inequality/mobility relationships as approximations of deeper relationships.

3.1. Family Investment Models

The classic models of intergenerational mobility, Becker & Tomes (1979, 1986) and Loury (1981), provide parsimonious representations of intergenerational mobility that can produce a GGC. We describe aspects of this class of models in detail as we use it to interpret alternative models. In the classical model of intergenerational mobility, parents divide income between educational investments in children and their own consumption. This leads to equilibrium investment decision rules of the form

$$e_{it} = a(y_{it}), \qquad 10.$$

which implicitly depend on the technologies that map investment to human capital and human capital to income, as well as beliefs about the ability and luck heterogeneity that distinguish individuals, as described below. Equation 10 embeds the assumption that parental income constrains the levels of investment in children. In the context of the two-period overlapping generations model, the only borrowing opportunity would require that loans are repaid by children, which is legally impermissible, hence no loans exist. While this extreme form of borrowing constraints is an artifice of the assumption that life spans comprise internally undifferentiated periods of childhood and adulthood, the qualitatively important idea is that parental resources do matter. Caucutt & Lochner (2020) and Lochner & Monge-Naranjo (2011) show how to model credit constraints that respect the details of the US system for financing higher education and provide evidence that these constraints matter.

Investments in children interact with latent ability λ_{it}[8] to produce human capital

$$h_{it} = b(e_{it}, \lambda_{it}). \qquad 11.$$

Human capital combines with labor market luck ς_{it+1} to produce adult income

$$y_{it+1} = c(h_{it}, \varsigma_{it+1}). \qquad 12.$$

Intergenerational dynamics take the general reduced form

$$y_{it+1} = \delta(y_{it}, \xi_{it+1}), \qquad 13.$$

where $\delta(\cdot)$ is a composite function of $a(\cdot)$, $b(\cdot)$, and $c(\cdot)$. As Solon (2004) shows, for Equation 13 to assume the form of Equation 2 requires very particular choices of utility and production functions [see also Durlauf (1996b), who develops somewhat different conditions to produce linear models]. In both cases, the functional forms needed to produce linearity are special relative to the spaces of utility functions of parents and the technologies that produce human capital and children and translate human capital into income.

Reduced form analyses of nonlinearities in the income transmission process have produced some evidence of their presence. Jäntti & Jenkins (2015) provide a survey. This evidence is not strong enough to have produced a general move among mobility researchers from linear to nonlinear models. In our judgment, the reason for these mixed results has to do with power. Bernard & Durlauf (1996) discuss the problem that linear models can mask the presence of multiple steady states in growth models, which are mathematically equivalent to mobility models. The same masking can occur if a statistical model is based on a parametric specification of a potential nonlinearity that poorly approximates the actual nonlinearity. In our judgment, economic theory should guide the search for possible nonlinearities in mobility. Some of the specifications studied, such as adding squared income to regressions such as Equation 2, do not correspond to the qualitative types of nonlinearities that are implied by the theoretical models we describe in this review. In contrast, Durlauf et al. (2017) consider a model with threshold effects that correspond to the sorts of nonlinearities that derive from neighborhood models and find strong evidence of nonlinearity. In our judgment, more work is needed on theory-guided approaches to uncovering nonlinearities in intergenerational data.

3.1.1. Psychic costs as a source of nonlinearity. While general classes of preferences and technologies can produce nonlinearities in the intergenerational transmission function $\delta(\cdot)$, one interesting argument, due to Sakamoto et al. (2014), is that psychic stresses associated with poverty and deprivation can inhibit the ability of children to develop human capital and of adults to convert human capital into income, providing a systemic discussion of empirical evidence.

[8]Latent ability is typically a catch all for any unobserved heterogeneity. Individual genotype is one source that is obviously relevant to mobility. Genotypic variation is of course correlated across generations, and affects the conditional probability structure given in Equation 1, as noted early on by Becker & Tomes (1979). Solon (2004) discusses implications of genotype in a linear version of Becker & Tomes.

This paper argues that these stresses can produce Gatsby-type behavior across countries because of differences in poverty rates; the same reasoning can produce a temporal GGC. Bertrand et al. (2006) provide an interesting exploration of how psychic cost differentials between the poor and nonpoor can cumulate to produce very different behaviors in terms of personal finances.

3.1.2. Credit constraints. Another potential source of nonlinearity in the way parental income maps to offspring income is the assumption that parents cannot borrow against future offspring income. Equation 13 is an equilibrium law of motion that depends on the borrowing constraint as well as the functional forms of technology and preferences. Two classic analyses of the special role of credit constraints in the mobility process were conducted by Galor & Zeira (1993) and Han & Mulligan (2001), each providing clear paths that lead from inequality to persistence. Each produces a framework that can generate GGC-type equilibrium dynamics.[9]

Galor & Zeira (1993) consider an environment in which borrowing constraints interact with fixed costs to achieve high educational attainment. This produces income dynamics with multiple steady states. Around each steady state, local parent-offspring dynamics can obey Equation 1. However, each steady state is associated with distinct parameter values for α and β. When one aggregates measures of inequality and mobility across a population in which different subpopulations converge to different steady states, one can produce a generalization of Equation 5 in which families partition into groups, each of which obeys its own linear model. Models differ according to the values of both the intercepts and IGEs. This leads to a clear intuition of how GGC-type behavior may be generated. If different distributions of income change the distribution of families around the different steady states, then the scalar measure of persistence generated by the misspecified Equation 2 will change. Bernard & Durlauf (1996) discuss this type of nonlinearity and the consequences for estimates of β; while that paper focuses on cross-country growth behavior, the model they discuss is mathematically equivalent to that of Galor & Zeira.

Han & Mulligan (2001) explicitly study the consequences for intergenerational mobility estimates of the credit constraints that families can face in educating children. Following Mulligan (1999), their paper derives laws of motion for families that are credit constrained versus those that are not and considers how different cross-sectional income densities of latent ability and parental altruism can affect aggregate mobility estimates. Credit-constrained families exhibit higher intergenerational elasticities of income than unconstrained families because of the impact of additional income on investment in offspring. However, heterogeneity in ability and parental altruism can generate analogous consequences. An important message is that the extent to which changes in the cross-sectional income distribution are associated with changes in the distribution of credit constraints, ability, or altruism can produce GGC-type relations.

3.1.3. General equilibrium effects. The frameworks we have described so far do not include any nontrivial general equilibrium effects in the sense that the income dynamics for one family are not affected by the decisions or outcomes of others. A distinct strain of research has explored inequality/persistence links when interest rates and/or wages are endogenously determined in economy-wide markets, which means that the decisions of each family are interdependent. These interdependencies can also occur through spillover effects.

Galor & Tsiddon (1997) made an early contribution that investigates how the interaction between the life cycle of technology and the components of the human capital production function (parental human capital and ability) determine the process of inequality, intergenerational

[9]Becker & Tomes (1979, 1986) noted earlier the effects of borrowing constraints on mobility, but these papers are the ones that systematically elaborate the implications of such constraints.

mobility, technological progress, and economic growth in a framework without credit constraints. Within each dynasty, the interaction effect derives from a parental externality whereby the worker's level of human capital positively depends on her parent's level of human capital. Across dynasties, individuals interact via the inventions externality whereby technological progress is an increasing function of the average level of ability in the technologically advanced sectors. In particular, individual earnings are determined by both individual skills and sector-specific skills, which are inherited from parents. In periods of major technological progress, the returns to skills increase, and ability becomes the dominating factor of labor market outcomes. As a result, both intergenerational mobility and inequality rise. Furthermore, technologically advanced sectors experience an increase in the concentration of high-ability, high–human capital individuals leading to further technological progress and economic growth. In contrast, when the technologies become more widely accessible, the importance of ability declines, inequality decreases but becomes persistent as parental socioeconomic conditions become the dominant factor, and mobility decreases.

These types of relationships are further explored by Hassler & Rodriguez Mora (2000) who consider how more rapid growth can affect the relative values of ability and social background in determining offspring income. In this analysis, periods of rapid technology change reduce the value of knowledge passed on by family background and make intellectual ability relatively more valuable. This feedback can produce multiple steady states with the property that more mobile steady states exhibit lower inequality, and hence a GGC.

Unlike Galor & Tsiddon (1997) and Hassler & Rodriguez Mora (2000), Owen & Weil (1998) and Maoz & Moav (1999) focus on models with credit constraints rather than technological progress. Owen & Weil develop a model that generates multiple equilibria that depend on the initial wealth distributions and allows social mobility even though the growth rate of the gross domestic product per capita is zero. The relationship between intergenerational mobility and growth is an equilibrium outcome, with causation running both ways. On the one hand, inequality is lower at a higher output level, and mobility is heightened. The rise in mobility stems from increases in the fraction of the educated labor force that reduces the wage gap between educated and uneducated workers, implying that more children of unskilled workers can afford education. On the other hand, mobility allows for more efficient allocation of resources, leading to more economic growth.

While Owen & Weil (1998) focus their analysis on the steady state, Maoz & Moav (1999) focus on the dynamics of inequality, mobility, and education allocation. In a model with extreme capital market imperfections, they obtain similar results. In particular, intergenerational mobility occurs as uneducated families decide to purchase education, leading to more human capital in the economy and more growth. The growth process decreases the wage earned by educated individuals and increases the wage earned by uneducated individuals. This implies that poor individuals face fewer liquidity constraints, leading to higher mobility and a higher correlation between the allocation of education and ability. At the same time, the incentives for investment in education decrease as the wage gap becomes smaller.

Hassler et al. (2007) show that richer modeling of labor markets can lead to more complex relationships between inequality and mobility. In particular, they allow skilled and unskilled labor supplies to affect wages in general equilibrium on the labor market. Furthermore, unlike the previous work that focused mainly on the dynamics of inequality, this study focuses on the cross-country differences in inequality and mobility and the relationship between inequality and mobility. As in the earlier models, parents make investments that produce either skilled or unskilled workers. Mobility is characterized by the probability that the child of an unskilled parent acquires skills. The wages for workers of each type depend on their relative supply levels in the population.

Increases in income inequality produce competing influences on the investments made by unskilled parents in their children, some leading to greater investment, others to less. When inequality increases, investments in children become more costly in utility terms, as unskilled incomes are relatively lower than skilled ones than before. However, suppose that changes in inequality are due to changes in the composition of the future skilled labor force. If there is a reduction in the relative supply of unskilled workers, as occurs when mobility is high, this raises the wages of the unskilled relative to the skilled, thus creating a channel by which higher mobility generates lower inequality. In sum, the paper argues that the covariation between inequality and mobility can be interpreted via changes in the educational system and the labor market. For example, increasing access to education both increases mobility and reduces the skilled/unskilled wage gap.

A different approach that generates links between a family's human capital investment decisions and those of other families is given by Peng (2021), who develops a model in which parental investments influence the job matching process between workers of heterogeneous ability and jobs with heterogeneous productivity opportunities. As innate ability is not observable, individuals compete in contests to signal ability, contests whose outcomes are determined by choices of effort as well as ability. The costs to effort, in turn, are lower the higher the level of bequests a child receives. Bequests are thus analogous to educational investments in the models we have described. The payoff in relative status from one family's bequest depends on the bequests made by other families to their children. Each family accounts for this dependence in its own investments. Thus, the future income of each child is determined by the distribution of incomes in the population, producing Equation 9.

Relative to our elementary framework, the general equilibrium models of Galor & Tsiddon (1997), Hassler & Rodriguez Mora (2000), Owen & Weil (1998), Maoz & Moav (1999), and Hassler et al. (2007) can be understood as modifying the income production function in Equation 12 to

$$y_{it+1} = c\,(h_{it}, h_{-it}, \varsigma_{it+1}), \qquad 14.$$

where h_{-it} represents the human capital of others in the labor market. Peng's model may be understood as modifying the parental investment decisions in Equation 11 to

$$e_{it} = a\,(y_{it}, e_{-it}). \qquad 15.$$

This formulation has important implications for thinking about data. It induces fundamental cross-sectional relationships across members of the population under study. As such, these models produce the conditional probability relationship in Equation 9 and so provide a clear channel as to why the income distribution will affect mobility statistics.

None of the family investment models logically entail a GGC in the sense that one can construct cases where increases in cross-sectional dispersion can reduce mobility; the distinct nonlinearities induced by preferences, technology, and borrowing constraints make counterexamples possible. But this does not detract from the powerful idea that different mixes of borrowing-constrained and unconstrained families can reduce overall mobility.

One final implication of the family investment models is that conventional empirical Gatsby analyses may need to be more fine-grained in the sense that the effects of increasing inequality on mobility depend on who is affected by the changes. For example, Chetty et al. (2014a) argue that mobility has not decreased in response to increases in inequality over the last several decades because the increase involves massive income growth in the very upper tail. Relative to the classical family growth model, these patterns are exactly what one would expect as changes in incomes of the credit constrained have different effects from changes in the unconstrained. Any rigorous claim of this type, of course, needs to be evaluated through White-type approximation analysis.

3.2. Skills Models

A second class of models that can produce a GGC are motivated by the modern literature on skill formation (Almlund et al. 2011), which takes a more complex view of the process by which parents influence children. In this approach, adult outcomes are influenced by cognitive and noncognitive skills acquired in response to a sequence of family inputs to produce both cognitive and noncognitive skills across childhood and adolescence. Relative to the classic models, there are two differences. First, the inputs that families provide involve more than the purchasing of educational investment. For example, inequalities in family structure (e.g., single parenthood versus an intact two-parent family) matter. Second, children are affected by trajectories of family inputs so that the timing of family influences matters. Carneiro et al. (2021) provide compelling evidence of the importance of timing based on Norwegian data.[10]

One leading example that employs skills-based ideas to understand the GGC is Becker et al. (2018). The key innovation in their model is to work with a modification of the human capital production function of Equation 12 to produce

$$h_{it} = b(e_{it}, h_{it-1}, \lambda_{it}), \tag{16}$$

(recall λ_{it} is individual ability) so that parental human capital affects the productivity of parental investments. The additional variable h_{it-1} proxies for the richer inputs of the skills approach. Parental human capital and investments are assumed to be complements,

$$\frac{\partial^2 b(e_{it}, h_{it-1}, \lambda_{it})}{\partial e_{it} \partial h_{it-1}} > 0, \tag{17}$$

so the marginal returns to investments by better-educated parents stochastically dominate those of less-educated parents. This condition, along with restrictions on preferences that ensure substitution effects dominate income effects, implies that parents with higher education invest more in their children at each income level. The effects of income inequality on offspring investment are therefore exacerbated. Not only do more affluent parents invest more in their children than do less affluent ones, but the impact of their investments stochastically dominates those of less affluent parents at each investment level. This effect also contributes to the nonlinearity in the transmission process in Equation 1. When these complementarities are strong enough, endogenously determined social classes can emerge as the model produces multiple steady states for families with different initial education levels.

Lee & Seshadri (2019) provide further insights into the GGC by studying dynamic complementarities across multiple stages of childhood investments and their relation to intergenerational and life cycle borrowing constraints. In their model, the IGE is mainly determined by the ability of young parents to provide early human capital investments in children, in conjunction with dynamic complementarities, rather than persistence in innate ability and/or the intergenerational borrowing constraint. A calibrated version of their model demonstrates that relaxing the intergenerational borrowing constraint yields marginal effects while relaxing the life cycle constraint produces sizable reductions in both intergenerational persistence and inequality in the long run. This happens because when the life cycle constraint is relaxed, the benefits of dynamic complementarity are exploited by almost all parents in the economy, reducing inequality and persistence. General equilibrium effects amplify the effect of policy changes such as education subsidies to the earliest period of childhood investments (ages 0–5) on IGE and inequality. These effects are due to the presence of dynamic complementarities and the fact that young parents are also likely to be borrowing constrained.

[10]Heckman & Mosso (2014) provide an elaboration of the general ideas of the skills approach for mobility.

3.3. Social Models

A third class of models involves social interactions. The basic idea in these models is that segregation of the rich and poor into distinct communities will produce disparate social interactions between their children and so transmit socioeconomic status across generations.[11] The GGC can emerge when changes in the cross-sectional distribution of income alter the nature of the equilibrium segregation of families. Durlauf (1996a,b) explicitly develops models of this type; Durlauf & Seshadri (2018) argue that these models provide a mechanism for the GGC. Bénabou (1996) provides a complementary analysis that works out the growth dynamics when one compares integrated and segregated neighborhoods. Fernandez & Rogerson (1996, 1997) and Epple & Romano (1998) provide seminal discussions of public education determination and neighborhood income segregation as well as the attendant effects on educational inequality.

Social models of intergenerational mobility emphasize two distinct forces, each of which links mobility to the levels of economic segregation. First, given local provision of public education, school district income distributions map to educational expenditures. The importance of these disparities in affecting educational outcomes has often been questioned; Hanushek (2003) gives a good overview of the skeptical literature. Our judgment is that recent research provides compelling evidence that expenditure differences matter. One reason is that recent studies are able to exploit exogenous expenditure variation in better ways than predecessors. For example, Jackson et al. (2016) exploit variations in court-ordered change in school expenditure formulas to identify effects on future wages of students, finding that the elasticity of wages for each 1% increase in per-pupil spending is 0.7. Another reason is that contemporary work has expanded the evaluation of spending to address interactions of school expenditures with other inputs to student skills. Johnson & Jackson (2019) demonstrate that school expenditure efficacy is greater when Head Start programs are also available. A comprehensive review of such studies is given by Jackson & Mackevicius (2021), who respect the presence of heterogeneity of effects across contexts and conclude that increased per-student spending raises student outcomes for approximately 90% of studies they consider.

Second, neighborhoods are carriers of many powerful influences on educational outcomes. One set of influences falls under the rubric of social interactions: peer effects, social learning, norms, and social networks.[12] Other influences can involve neighborhood characteristics such as environmental levels of criminality and violence. Inequalities in social interactions and neighborhood characteristics are induced by income inequalities because of segregation and matter even if income inequalities themselves are not affecting outcomes via the political economy of educational finance.

Social models can be understood as involving both school and neighborhood effects. Wodtke et al. (2020) demonstrate the importance of treating school quality and neighborhood characteristics as distinct social influences, as they find that school quality does not mitigate neighborhood quality in predicting child outcomes. We see value in enriching social models with more explicit considerations of social network relationships that occur within neighborhoods and schools, especially with respect to degrees of homophily. Moody (2001) conducts an exemplary study of

[11]A remarkable predecessor to current social models of intergenerational mobility is Loury (1977), which modelled how initial social capital disparities between blacks and whites can produce a low steady-state income level for one population and a high income steady state for the other. While the focus is on racial disparities, the nonergodicity of the model has very similar features to neighborhood models where poverty traps, for example, can emerge via isolation of the poor.

[12]Similarities and differences between economics and sociology perspectives on social interactions can be seen in comparing Durlauf & Ioannides (2010) and Sharkey & Faber (2014).

school friendships, illustrating the richness of this channel, while Currarini et al. (2009) provide theory.

The import of location on child outcomes has been demonstrated in many studies. Crowder & South (2011), Wodtke et al. (2011), and Chetty & Hendren (2018a,b) show how the time spent by children in higher-quality neighborhoods improves educational and other outcomes. Chetty et al. (2016) show how the Moving to Opportunity demonstration, in which disadvantaged families were offered incentives to move to lower-poverty neighborhoods, led to substantial long-run effects on future family and labor market outcomes for children who moved during childhood, although effects for moves during adolescence were negative. This is an especially striking finding given the generally mixed evidence of short-run program effects. An especially compelling demonstration of the effects of these influences is given by Manduca & Sampson (2019), who study how neighborhood heterogeneity in exposure to violence, incarceration, and lead exposure has large mobility consequences.

The basic ideas of the social approach may be captured by modifying Equations 12 and 13 to include neighborhood characteristics n_{it} so that

$$h_{it} = h(e_{it}, n_{it}, \lambda_{it}) \qquad 18.$$

and

$$y_{it+1} = c(h_{it}, n_{it}, \varsigma_{it+1}), \qquad 19.$$

respectively. Examples of possible elements of n_{it} include peer public good measures such as per-pupil educational expenditures or average teacher quality, behaviors such as average test scores, role model effects such as fractions of parents who have attended college, or measures of lead paint exposure. Both functions are assumed to exhibit complementarities between measures of neighborhood quality and school quality in childhood and human capital and labor market success in adulthood, respectively. Formally,

$$\frac{\partial^2 h(e_{it}, n_{it}, \lambda_{it})}{\partial e_{it}\partial n_{it}} > 0; \frac{\partial^2 c(h_{it}, n_{it}, \varsigma_{it+1})}{\partial h_{it}\partial n_{it}} > 0. \qquad 20.$$

Social models produce different intergenerational income dynamics than do the family models. Adults realize levels of income based on their human capital and luck, as occurs in the family and skill cases. However, the logic of their choice with respect to child human capital is different. Given their incomes, parents become members of neighborhoods. The equilibrium configuration of families across neighborhoods is determined by some combination of zoning restrictions, house rental price differences,[13] and the physical structure of neighborhoods.[14] As a result, there is income segregation of neighborhoods. Neighborhoods produce education for children as a public good. The quality of public education is determined by democratically chosen tax rates, the associated tax revenues generated given the income distribution to which the tax rates are applied, and neighborhood size. Family income thus maps to future child income because of the effect of parental income on the choice of neighborhood.

Together, these influences produce dynamics in neighborhood characteristics experienced by children of the form

$$n_{it} = d(y_{it}, y_{-it}). \qquad 21.$$

[13] Neighborhood memberships are modeled as rentals, not ownerships. Introduction of ownership of a housing stock would introduce complications in terms of capital gains and so is avoided.

[14] By physical structure of neighborhoods, we mean the number of neighborhoods and the size constraints on the neighborhoods. This structure naturally places limits on the degree of segregation that can emerge in equilibrium.

The discreteness of neighborhoods is (generically) a source of nonlinearity in the transmission process. Note that the entire income distribution matters for each child since neighborhood composition is determined as a general equilibrium across all families; this leads to Equation 9 above as the appropriate stochastic process for family income.

How can this model produce a GGC? Greater dispersion in parental incomes has two effects on the variation of neighborhood characteristics across offspring. First, for a given distribution of families across neighborhoods, greater inequality can, via its effects on school quality and social phenomena, increase the heterogeneity in social effects across neighborhoods. Second, greater inequality can increase the level of income segregation. This can occur, for example, when families have preferences for larger communities as well as more affluent ones. Alternatively, when families are not ideally located due to costs of moving, the incentives to do so can be enhanced by greater within-neighborhood heterogeneity. Greater cross-sectional inequality thus leads to greater income segregation, which leads to greater disparities in the environments in which children grow up, thus increasing persistence.[15]

Social models have a different probability structure from the baseline family models in that their core logic produces laws of motion for individual incomes that obey Equation 9; that is, the conditional probabilities of offspring income depend on the entire vector of incomes in the population. This occurs because the characteristics of a child's neighborhood depend on the equilibrium sorting of families, which in turn is determined by the (constrained choices) of all the families. Even if the outcomes in a neighborhood only depend on the mean income in a neighborhood $\bar{y}_{-it}$ (a common assumption in social interactions models), it is evident that dispersion in the income distribution matters for children as it determines how much segregation occurs. This provides another mechanism to produce a GGC.

One question raised by social models is the extent to which family and social influence work as complements or substitutes. Wodtke et al. (2016) provide the most compelling evidence on this question. This analysis finds complementarity between neighborhood quality and parental income in the sense, most significantly, that children from poor families are especially harmed when growing up in poor communities. Hence family and social mechanisms that matter for a GGC appear to be mutually reinforcing.

Fogli & Guerrieri (2019) provide the most successful empirical evaluation of structural social models of inequality and mobility, linking human capital accumulation with residential choice and neighborhood spillovers. Investment in human capital generates higher returns for children raised in neighborhoods with a higher average level of human capital. The endogeneity of the local spillovers generates a feedback effect between inequality and residential segregation that amplifies the response of the inequality to shocks. In particular, a skill-biased technical shock increases inequality as the disparity between college-educated workers and workers with no college education increases. Given the importance of the complementarity between neighborhood externalities and education, the skill-premium shock generates higher demand by college-educated parents for the neighborhood with the stronger spillover that pushes up housing costs, leading to a higher degree of segregation by income. In turn, that segregation reduces intergenerational mobility over time as the disparity in the average human capital between better neighborhoods and poor

[15] Reardon & Bischoff (2011) and Reardon et al. (2015) are very valuable empirical assessments of the role played by increases in inequality in increasing economic segregation. One finding of this work is that increasing income segregation is occurring against a background of some diminution of racial segregation. See Mayer (2001) and Watson (2009) as valuable predecessors.

neighborhoods increases even further, leading to persistent inequality. The model is calibrated using US data from 1980 and estimates from Chetty & Hendren (2018b), who estimated the effect of neighborhood exposure using administrative data. When a skill-biased technology shock occurs, income segregation accounts for 18% of the entire increase in inequality between 1980 and 2010. This segregation accounts for 12% of the rise in the rank-rank correlation between 1980 and 2010, amplifying intergenerational persistence.

As in the case of the family models, the GGC is not logically entailed by social models in the sense that its presence depends on the specifications of technology, preferences, and the initial income distribution with respect to which one considers counterfactual distributions. But the basic behavioral logic is clear.

3.4. Political Economy

A distinct set of theories that can be a source of the GGC focuses on the determinants and consequences of redistributive policies (e.g., the provision of public goods) as outcomes of voting choice. Relative to the family and social investment models, these models emphasize the role of the political process in determining public educational investments. This interdependence is distinct from those that arise from social interactions or general equilibrium outcomes; further, the political economy is qualitatively richer than it appears in the social models. As the outcomes of the political process are dependent on the distribution of income μ_t, these models extend our baseline family model by replacing Equation 10 with

$$e_{it} = a\left(y_{it}, \mu_t\right). \qquad 22.$$

Inequality potentially then goes on to influence intergenerational mobility as Equation 22 filters through to the equilibrium income process in Equation 14 above, hence allowing for a potential GGC to arise in equilibrium.

3.4.1. Median voter models.

Classical political economy considerations create a relationship between cross-sectional inequality and mobility via changes in the preferences of the median voter. The canonical work in this area is by Meltzer & Richard (1981), who consider redistributive policies determined by majority voting (i.e., the median voter). They argue that higher levels of inequality generate demand for redistribution since the median voter becomes relatively poorer. Such an approach focuses on the relationship between the preferences of the median voter and inequality.

In the context of Meltzer & Richard, a set of papers by Perotti (1993), Alesina & Rodrik (1994), and Persson & Tabellini (1994) consider how inequality influences the choice of fiscal policy, which distorts the incentives to work or invest with adverse effects on growth and potentially on intergenerational mobility. An interesting recent paper by Campomanes (2022) argues that the fiscal policy has both redistributive and insurance effects against future income shocks. As a result, the relationship between inequality, redistribution, and growth depends on social mobility in society. The idea is that a rich individual expects to be harmed by the redistributive effects of the fiscal policy. At the same time, the benefits from insurance are small as the risk of losing status is low in a society with low mobility. Thus, the individual opposes redistribution. In contrast, when there is high mobility, the insurance effects are large, thus the individual votes for redistribution. As a result, in a society with high social mobility, a rise in inequality leads to an increase in redistribution, while in a society with low mobility, an increase in inequality leads to a decrease in redistribution.

3.4.2. Power differentials. A distinct political economy source for the GGC derives from the existence of wealth biases in political power (shifting power away from the median voter).[16] In terms of the general relationship between economic inequality and political inequality, Acemoglu & Robinson (2008) present a general framework for thinking about how extensions of the franchise confer de jure political power on the citizenry while, at the same time, allowing elites to invest in activities that maintain their hold on de facto political power.[17] Acemoglu & Robinson conceive of political institutions (such as democracy) and political power within those institutions as equilibrium outcomes based on a contest between a more numerous citizenry and a smaller, wealthier elite with potentially diverging policy preferences. Their model admits an invariance equilibrium where the wealthier elites contribute sufficiently to activities that increase their de facto political power to such an extent that they offset entirely the de jure power of the citizenry stemming from their greater numbers. In this equilibrium, elites gain control of economic policies regardless of the nature of political institutions (democratic or otherwise).

In the context of democratic polities, a natural issue involves the role of campaign contributions in creating a wealth/political power relationship. Roemer (2007) considers the presence of informed and uninformed voters and explicitly considers a model where political competition occurs between two parties, each of which draws upon private financing (that may be subjected to different types of constraints, e.g., a cap on individual contributions) for political campaigns. He shows that lower constraints on private campaign financing coupled with a higher fraction of uninformed voters result in the policies of both parties being more biased toward the preferences of the wealthy. In a similar spirit, Campante (2011) explores a model where political participation takes the form of voting as well as individual (private) campaign contributions. Like Roemer, Campante's model suggests a wealth bias in policy outcomes.

The literature that links wealth distributions to the distribution of political power and, in turn, to power over (redistribution) policy choices is large, and the above examples are meant to be illustrative and not exhaustive (for a survey, see Acemoglu et al. 2015). The key point here is that such models represent breaks from median voter determination of redistribution policies. To the extent that such policies affect mobility, these linkages suggest complex inequality/mobility dynamics that potentially produce Gatsby-type outcomes. For example, Campante (2011) finds a nonmonotonic relationship between inequality and redistribution, so that redistribution first increases with inequality but then eventually decreases at higher levels of inequality.

Rauh's (2017) effort is the most successful in generating GGC-type outcomes via power differentials. This model focuses on heterogeneity in political participation across the wealth distribution, following ideas in Bénabou (2000), de la Croix & Doepke (2003), and Ichino et al. (2011). In his model, education can be privately or publicly funded. Public education expenditures are

[16]Bartels (2016) makes the case that elected politicians tend to be more responsive to the positions of the rich, contributing to the divergence of income growth between rich and poor. Karabarbounis (2011) provides cross-country evidence that when an economic class becomes more affluent, policies tilt in its favor. Kalla & Broockman (2016) provide evidence that money buys you access using a field experiment that shows that politicians are more willing to meet with a donor than a nondonor. In contrast, Fowler et al. (2020) find no evidence on the effects of corporate campaign contributions using either a method that depends on random results of very close elections (a regression discontinuity design) or a method that relies on within-campaign variation in market beliefs about US Senate elections. Overall, while there is a strong correlation between wealth and desired political outcomes, the causal evidence does not appear strong enough to identify the underlying mechanisms. One reason for this identification challenge concerns the difficulty in measuring politicians' reactions to campaign donations.

[17]The equilibrium effects of different wealth distributions and mappings from political expenditures to power was also recently explored in Eguia & Xefteris (2021).

endogenously determined through voting and influence mobility. Funding for public education needs to compete with other voter priorities, such as public pension benefits. Optimal public financing of both priorities is therefore sensitive to the level of inequality as well as voter turnout, which may vary across demographic groups (e.g., age cohorts, cohorts with different levels of education). Rauh calibrates his model to a number of North American and European countries. He finds that the nature of voter turnout in the United States—low turnout that skews to the educated—explains more than one-quarter of the variation in earnings inequality and intergenerational persistence when comparing the United States to the other countries in his sample.

3.4.3. Determinants of voting choices. The redistribution preferences of voters (including the decisive voter) are potentially shaped by their beliefs, and when such beliefs are influenced by inequality, this forms another channel for generating a GGC. Hirschman & Rothschild (1973) examine the tolerance of individuals for inequality based on their own perceived prospect of advancement. Bénabou & Ok (2001) investigate how people's votes depend on how they assess their prospects for upward mobility relative to the rest of the population. Under certain assumptions in a two-period model, they show that poor individuals optimally choose to oppose redistribution policies if they consider the prospects of upward mobility in the future or for future generations to be sufficiently favorable.

Redistribution preferences are also informed by the beliefs that people hold about the determinants of upward mobility, e.g., the roles of luck and effort in life. An example is the Belief in a Just World (BJW) hypothesis that describes the popular perception that people get what they deserve and deserve what they get (Lerner 1980). Such a perspective de-emphasizes the effects of circumstances outside of an individual's control (luck) in determining outcomes then leads to a higher tolerance for inequality and also a reduction in support for redistribution policies that would help overcome such inequality.[18]

The extent to which the BJW perspective applies varies across contexts. For example, the United States is characterized by low redistribution and just-world beliefs about social mobility. Most people believe that effort, as opposed to luck, is the key ingredient for economic success in life. In contrast, Europe features high redistribution and welfare states. The majority there believes that luck and connections rather than hard work determine economic success (Alesina & Giuliano 2010, Alesina et al. 2001). Recent work has evaluated the accuracy of beliefs about inequality. Alesina et al. (2018) uncover empirical evidence that individuals have biased perceptions of actual intergenerational mobility. Americans are more (unjustifiably) optimistic than Europeans in assessing actual mobility resulting in lower support for redistributive policies.

Beliefs about fairness can lead to multiple equilibria in mobility and inequality, whose existence can in turn constitute a distinct explanation for a cross-country GGC. As argued by Alesina & Angeletos (2005) and Bénabou & Tirole (2006), in societies with a meager welfare state, incentives exist for parents to hold and transmit to their children just-world beliefs, and as a result, those societies vote for low taxes. In contrast, in societies with high degrees of social safety and redistribution, fewer people believe in a just world, and thus the majority votes for high redistribution. Beliefs about social justice or fairness in the determination of income result in multiple equilibria that, in turn, make these beliefs self-fulfilling. In such situations, multiple equilibria can explain the coexistence of the American Dream and Europessimism. In an American Dream equilibrium, the

[18]This work is tightly linked to a larger literature in social psychology that documents the effects of social class on individual beliefs and behavior, finding that individuals from higher social classes are generally characterized as exhibiting lower levels of empathy and prosocial behavior than those from lower social classes (e.g., Kraus et al. 2012, Manstead 2018).

society believes that income is determined by effort and social mobility is high. As a result, taxes and redistribution are low, individuals invest more and exert higher effort, and inequality is higher. In a Europessimism equilibrium, the society believes that luck, birth, connections, and corruption are the major determinants of income, and taxes and redistribution are higher; individuals put in less effort and invest less, but inequality is lower. These different equilibria therefore explain the data points we see on the GGC in **Figure 1** where European countries generally exhibit lower inequality and higher mobility compared to the United States.

3.4.4. Meritocracy. While the literature focuses on the political economy of the GGC and emphasizes the nature of preference aggregation and choice of redistributive policies, this does not exhaust the ways that policies can affect equality/mobility relationships. In an interesting recent paper, Comerford et al. (2022) argue that differences in levels of meritocracy, defined as differences in the extent to which education reveals ability versus family background, can produce a GGC. In this analysis, more meritocratic societies have greater inequality and lower mobility as incentives to invest in children are enhanced among the affluent. Ability and family background more closely correlate in more meritocratic societies. While these arguments relate to the functional forms of the dynamics of human capital and income in the family investment model, the choice of level of meritocracy is in important dimensions collectively determined via rules for public education, ranging from admissions rules to costs. Zhou (2019) indicates the empirical importance of these considerations by demonstrating the extent to which empirical links between college and upward mobility reflect selection rather than a causal relationship.

3.5. Aspirations

We believe there is a fifth theoretical perspective that can explain the GGC: the role of aspirations in determining individual choices. While skills provide the capacity to act, aspirations reflect the ability to identify and set goals with the intent to put the effort into achieving those goals. Aspirations are related to expectations, but as Morgan (2007) notes, aspirations involve idealistic goals, which involve more than standard models of belief formation. As such, aspirations have both belief and preference dimensions that, in our view, constitute a distinct, psychology-based approach to the inequality/mobility nexus. The logic of this relationship is straightforward. Aspirations are affected by family and social influences in ways generating greater dispersion in aspirations as inequality increases, which can lead to a GGC in the same way that the family and social models we have outlined above produce the relationship. We see the explicit linking of aspirations to the GGC as a potentially important new direction for research.

The role of aspirations in inequality has a long pedigree in sociology and represents a major causal pathway in the Wisconsin Status Attainment Model (Sewell & Hauser 1975; Sewell et al. 1969, 1970), which is the workhorse of intergenerational mobility in sociology. Morgan (2002) extends this approach to one that accounts for limits to forward-looking behavior. These approaches have emphasized the beliefs dimension of aspirations. The empirical power of this approach is illustrated by Morgan et al. (2013), who show that high school students with inaccurate beliefs or uncertain beliefs about the education requirements for jobs they have identified as part of future occupational plans are associated with lower educational attainment. Interestingly, these patterns are robust to family background controls, as model parameters exhibit some, but not large reductions. To the extent that inaccurate beliefs are influenced by family background, this can be construed as evidence of a mechanism contributing to a GGC.

Other important evidence on aspirations derives from ethnographic and mixed methods work. One classic example is by Edin & Kefalas (2005), who study motherhood and poor women, where aspirations about marriage and child prospects for the poor are elucidated. Another classic work is by Lareau (2003), who studies how families from different socioeconomic classes have very different skill repertoires and beliefs concerning child development, paying particular attention to schools and education; Lareau & Weininger (2008) extend this work to the study of the transition from high school to higher education. The key message for economists is that aspirations involve worldviews that challenge the ways that conventional choice models describe decisions, a challenge that has been at least partially addressed, as we discuss below.

Psychology provides insights into aspirations from the vantage point of understanding the dimensions of motivations and perceptions of personal capabilities. Space precludes extensive discussion; we refer readers to Eccles & Wigfield (2002) and Brandstätter & Bernecker (2022). Much of this perspective is associated with Albert Bandura's (1997) theory of self-efficacy and Jacqueline Eccles's (1983) work on expectancy-motivation theory, which we believe are underappreciated by economists. Browman et al. (2019) provide a rich argument on how psychological perspectives on motivation can enrich economic approaches to understanding the effects of low–socioeconomic status backgrounds on children and adolescents.

Within economics, interest in aspirations has emerged primarily within development economics to understand poverty traps with a relative emphasis on their role in preferences. The idea is that poverty is not only due to external constraints such as credit and health but also due to internal constraints such as aspirations. Thus, failure or lack of aspirations may lead to extreme immobility, namely, poverty traps. This work draws from social sciences such as anthropology, for example, Appadurai (2004), who views aspirations as socially determined. He argues that an important reason for the persistence of poverty is the lack of capacity to aspire, which is viewed as a navigational capacity, that is, how people explore their future possibilities. The idea is that richer individuals develop this capacity more effectively than poor people because they have more access to information and opportunities and then spread their knowledge to their network. Hence, although the poor have aspirations, their capacity to aspire to better circumstances is weaker since they do not practice it due to limited opportunities.

A rich theory of aspirations and social influences has been developed by Ray (Ray 2002, 2006, 2010; Genicot & Ray 2017). Ray (2006) introduces the notion of an aspiration window, which is identified as the set of experiences, places, and individuals that someone uses to compare and formulate an opinion of what may be achieved in the future. Aspirations in turn have powerful social components. For example, role models may change aspirations because they serve as sources of information or common experiences. This work is therefore also related to the equality-of-opportunity literature; for a survey, see Ferreirra & Peragine (2016), who speak to the respective roles of effort and circumstances in determining outcomes. For example, Piketty (1995) describes how an individual's choice of effort level and support for redistribution may be contingent upon her learnt experience regarding the extent to which effort (as opposed to circumstances) facilitates upward mobility. To the extent that constraints on opportunity discourage effort, they may concurrently dampen the aspirations that drive that effort.

More recently, Genicot & Ray (2017) investigate the connection between aspirations and inequality and develop a theory of aspiration formation that allows the joint evolution of aspirations and income distributions. The idea is that the experiences, places, and individuals who are inside a person's aspiration window determine their aspiration gap, which is defined as the distance between the aspired status and actual status already achieved. When the aspiration gap is too small, there are no incentives to put in more effort, resulting in lower investments. Likewise, when the aspiration gap is too large, even with high effort, the desired outcome will not be achieved, leading again to low investments as the result of frustrated aspirations. Both a large and a small gap have the potential to result in a society with high inequality.

An alternative theory of aspirations is proposed by Dalton et al. (2016), who attempt to identify the causal relationship between aspiration failure and poverty traps. They distinguish between two types of poverty traps: standard poverty traps driven by external constraints and behavioral poverty traps. A behavioral poverty trap is created when the individual fails to take into account the feedback from effort to aspirations. Specifically, a poor person may exert less effort than a rich one since her marginal benefit of effort is lower due to the complementarity between effort and capital. Moreover, the aspiration of the poor may be lower than that of the rich because of the feedback from effort to aspirations. As a result, the marginal benefit of effort in equilibrium is further reduced. They conclude that aspirational failure is the result, rather than the cause, of poverty traps.

While we have defined aspirations as a separate theory of the GGC, we see this perspective as part of a broader set of ideas regarding the importance of cultural capital in which cross-sectional income inequality is linked to inequality in cultural capital and thus to mobility. Small et al. (2010, p. 9) provide a broad conceptualization of culture's role in understanding poverty: "We outline seven different but sometimes overlapping perspectives, based on seven different concepts—values, frames, repertoires, narratives, symbolic boundaries, cultural capital, and institutions—illustrating how a greater sensitivity to cultural conditions can enrich our understanding of poverty."

These concepts, of course, apply across the income distribution. Lareau's (1989, 2003) classic work demonstrates how differences in cultural capital between parents of different social classes matter for a range of parenting inputs into the education process with attendant implications for inequality. Khan (2011) shows how cultural capital emerges to create reinforcements of elite self-perceptions. Cherlin (2014) describes the effects of rising inequality on working-class culture, with a focus on the implications of family structure. La Ferrara (2019) investigates the role of poverty, income, inequality, and educational systems in educational and occupational expectations (as proxies of aspirations) using the Organisation for Economic Co-operation and Development's Program for International Student Assessment data. Lekfuangfu & Odermatt (2020) provide evidence of the role of occupational aspirations in intergenerational occupational mobility using British cohort data. All of this work suggests that cross-sectional inequality can influence world views, beliefs, and norms of parents in ways that go beyond standard economic models and that can produce novel channels for a GGC.[19] Finally, it is important to observe that the aspirations/social efficacy/cultural capital perspectives are deeply social as these dimensions of personal psychology are shaped by interactions with and perceptions of others and so link to the social theories we have described.

4. EMPIRICAL EVIDENCE

The cross-country findings on the GGC have generated many subsequent empirical studies. Here we highlight the major directions of this work.

4.1. Gatsby Curves Within Countries and Regions

A number of papers have explored the presence of GGCs in various countries and regions. **Table 1** provides a summary.

[19]Identity, as conceptualized by Akerlof & Kranton (2000, 2002), naturally links to aspirations and cultural capital; idealization of one's possible place in society is intimately linked to one's self conception. Oyserman (2013) discusses identity and motivation in ways that apply to our general discussion.

Table 1 Empirical evidence of Great Gatsby Curves within countries and regions

Country or region	Author(s)	Unit of analysis	Measure of intergenerational mobility	Measure of inequality	Findings
Canada	Corak (2020)	Census divisions	The bottom-quintile to bottom-quintile transition probability	Gini coefficient	Positive
Canada	Connolly et al. (2019)	Census divisions	IGE, rank-rank correlation	Gini coefficient	Positive
China	Fan et al. (2021)	Provinces	IGE	Gini coefficient	Positive
France	Mogila et al. (2020)	NUTS2 regions (22 regions in France defined between 1982 and 2015)	The percentage of individuals who did not move income decile and percentage of individuals who moved up along income deciles	Income share ratios and Gini coefficient	Null
Italy	Güell et al. (2018)	Provinces	The Informational Content of Surnames (defined as the ratio of the variance of income conditional on sharing a surname to the unconditional variance of income)	Standard deviation of log income	Positive
Italy	Acciari et al. (2020)	Provinces	IGE, rank-rank correlation, the Informational Content of Surnames, the mean rank of children whose parents are below the median of their own national income distribution	Gini coefficient, Gini bottom 99%, top 1% income share, 90-10 income ratio, and standard deviation of log income	Positive
Korea	Kwon & Jeon (2020)	Metropolitan cities and provinces	IGE	Gini coefficient, 20/20 ratio, and Palma ratio	Positive
Latin America	Neidhöfer et al. (2018)	Countries	Spearman's rank correlation coefficient, transition probabilities, two indexes of absolute and directional mobility	Gini coefficient	Positive
Spain	Mogila et al. (2020)	NUTS2 regions (17 autonomous communities and 2 autonomous cities)	The positional/rank change of a given individual along the income distribution, namely the percentage of individuals who did not move income decile and percentage of individuals who moved up along income deciles	Income share ratios and Gini coefficient	Null
Sweden	Brandén (2019)	Commuting zones/cohorts	IGE, rank-rank correlation	Gini coefficient	Positive
United States	Chetty et al. (2014b)	Commuting zones	Absolute mobility (expected child rank of children born to a parent whose national income rank is p in a particular commuting zone), relative immobility (coefficient of the rank-rank regression)	Gini coefficient	Positive

Abbreviation: IGE, intergenerational elasticity of income.

One interesting direction of research on the GGC has been the move away from advanced industrialized economies to consider other contexts. One important example is by Fan et al. (2021), who explore intergenerational income persistence and its relationship with inequality in China from 1979, that is, when economic reforms began. At the national level, Fan et al. document evidence for rising intergenerational income persistence associated with rising inequality for birth cohorts in the 1970s to the subsequent cohorts in the 1980s. They also investigate this relationship at the provincial level and find strong evidence of an overall GGC relating provincial Gini coefficients to a range of measures of both absolute and relative intergenerational persistence. This was done by considering inequality when measured by province, cohort, and *hukou* (Chinese official residency) status.

One concern the authors have is that the estimated provincial-level relationship between inequality and persistence might be driven by unobserved province fixed effects. In fact, the evidence for the relationship becomes substantially weaker when the authors employ a first difference specification. Nevertheless, the authors uncover interesting patterns when delving into the experiences of subgroups. For example, urban areas experienced greater increases in intergenerational income persistence compared to rural areas across cohorts. The authors posit that one explanation for this pattern could be the relaxation of *hukou* restrictions facilitating rural-urban migration and thereby opening up more opportunities for upward mobility for those born in rural areas. The implication is that further structural reforms to residency restrictions and lowering barriers to internal migration by the Chinese government may lead to beneficial outcomes.

A second interesting body of work has focused on Latin America. Latin American societies are characterized by levels of economic inequality that are extreme compared to other regions of the world (López-Calva & Lustig 2010). As discussed in an excellent survey by Torche (2014), a distinctive feature of this inequality is the concentration of wealth and income at the very top of the distribution, resulting in a huge disparity between the rich and middle class. Consistent with the GGC, Latin America has historically exhibited low levels of economic mobility in association with high inequality. Earnings data availability for analyzing mobility is sparse, so most work has focused on Brazil, Chile, and Mexico. For Brazil, Ferreira & Veloso (2006) find an intergenerational elasticity of 0.66 for earnings, while Dunn (2007) finds an intergenerational elasticity of between 0.69 and 0.85 depending on the age range of the male offspring. Similarly, Núñez & Miranda (2010) find intergenerational elasticities between 0.57 and 0.73 for men in the case of Chile. By estimating permanent incomes for both generations, Torche (2010) estimates the intergenerational elasticity for earnings in Mexico to be about 0.67. These numbers compare very unfavorably with, for example, the United States. When considering findings using transition tables, Torche (2014) notes that economic mobility in these countries is characterized by high persistence at the top of the income distribution but more mobility for middle and lower socioeconomic classes.

In recent work, Neidhofer et al. (2018) and Neidhofer (2019) consider inequality and intergenerational mobility in educational attainment (instead of earnings) using harmonized survey data for 18 Latin American countries over 50 years. Both studies find a positive association between income inequality and intergenerational persistence in educational outcomes, providing microfoundations for a GGC. The studies emphasized that educational mobility varied substantially across countries and cohorts in their sample.

Intracountry efforts to identify Gatsby curves are predicated on the presence of spatial heterogeneity in intergenerational mobility coefficients, an idea that is fundamental to much modern mobility work and pioneered in Chetty et al. (2014b). This is an example where the choice of mobility statistic matters in terms of the strength of evidence. Mogstad et al. (2020) argue that the ranking of certain locational upward mobility measures is much less precise than has been claimed, and they have challenged some of the claims in Chetty et al. (2018) concerning heterogeneity in upward mobility across locations. The upward mobility measure considered is $\alpha_n + .25\beta_n$, where α_n and β_n index parameters of a rank-rank formulation in Equation 2, which differ across locations n; the distribution for $\alpha_n + .25\beta_n$ thus reveals how different locations affect the expected rank of a child whose family income is at the twenty-fifth percentile. The key issue raised by Mogstad et al. is that sampling variability in $\alpha_n + .25\beta_n$ is compounded by the joint variation of both parameters. These authors construct confidence sets for population ranks and conclude they are so large as to preclude strong claims on locational mobility heterogeneity. The issue of sampling variation, of course, matters for any mobility measure. Cholli et al. (2021), studying log income regressions, find that 70% of the estimated IGE heterogeneity across Danish parishes, weighted by population, is due to sampling error.

4.2. Gatsby Curves Beyond Income

A number of authors have looked for GGCs that involve variables other than income. One dimension of this work involves identifying GGCs that link income persistence to cross-sectional inequalities for factors that determine income. Mazumder (2015) finds that cross-country GGCs exist between the IGE and ninetieth/tenth-percentile ratios for various measures of cognitive skills (numeracy, literacy, and problem solving) as well as measures of noncognitive skills. The common qualitative patterns for both cognitive and noncognitive skills are consistent with mechanisms found in the family and social models when one takes the perspective of the coevolution of skills found in Cunha & Heckman (2007).

Other work in this spirit has linked inequality to educational disparities. Kourtellos (2021) uses cross-country data to identify a regression kink effect in absolute upward mobility of education due to high inequality in education. At lower levels of inequality of parental education, the relationship between intergenerational mobility in education and the Gini coefficient of parental education is positive, but there exists a critical point at about the forty-first percentile of the Gini coefficient over which the slope of the relationship becomes negative. Analogous evidence may be found within countries. Kearney & Levine (2016) report Gatsby curves relating higher state-level income inequality to higher rates of high school noncompletion. Aydemir & Yaziki (2014) find that Turkish provinces with higher educational inequality among adults exhibit greater intergenerational persistence of education between parents and daughters.

An important development in the study of GGCs is due to Hertel & Groh-Samberg (2019), who move away from a focus on the intergenerational persistence of income to that of social class, where classes are defined by groups of occupations, following the longstanding emphasis in sociology on intergenerational class and occupational mobility. This focus on occupations is an important new direction for research for three reasons. First, the statistical relationship between occupational and income mobility is surprisingly weak;[20] hence there is new information in this dimension of mobility/inequality linkages. Second, substantively, class and income are different dimensions of socioeconomic inequality, and the importance of occupation to life satisfaction, perceptions of one's place in society, and the like make it a vital dimension of inequality that income does not capture; Erickson & Goldthorpe (2010) provide a valuable discussion.

Hertel & Groh-Samberg (2019) argue that the larger the differences in resources between social classes, the greater the occupational persistence observed across generations. They define resources in terms of income, education, and wages, arguing that each constitutes a distinct way to

[20]For a general cross-country evaluation, readers are referred to Blanden (2013); and for a detailed analysis of the case of Sweden, readers are referred to Breen et al. (2015).

understand how resources matter. Hence, income captures parental investments, education affects cultural capital and information about the education process, and wages proxy for the way that parental occupation affects children. The magnitudes of interclass differences are shown to be negatively associated with mobility using a standard typology of social classes from to Erikson et al. (1979).[21] An important feature of this work is that it emphasizes how inequalities across groups defined by class rather than spatial proximity can produce GGC-type behavior. In this sense, the analysis is complementary to the social models of the curve.

Mood (2017) builds on Breen et al. (2015) by developing a systematic joint relationship between the intergenerational evolution of social class and income. An interesting feature of this paper is the conclusion that nonlinearities in the income transmission process between parents and children are substantially mediated by class differences. This distinct role for social class as opposed to income as a source for nonlinearities in the intergenerational transmission process of income is novel relative to the theories of the GGC that have been developed and perhaps may link to the roles of aspirations and identity in generating the curve. The implications of class influences on the generation of nonlinearities in the income/mobility relationship are also discussed in Bukodi & Goldthorpe (2018).

This recent work illustrates the broad importance of investigating GGCs in which individuals are clustered by social space rather than physical space.[22] Another dimension that warrants study is ethnicity. Akee et al. (2019) demonstrate what this can mean, as they show that within-group inequality and within-group intragenerational persistence are lower for American Indians, Blacks, and Hispanics than for Asians and Whites. There is longstanding evidence of racial differences in mobility. Bhattacharya & Mazumder (2011) use Markov chain methods to show that relative intergenerational mobility, relative to the entire US population, differs between Blacks and Whites. Collins & Wannamaker (2021) provide systematic evidence on long-run mobility differences by race. This work sits against a longstanding literature on occupational mobility differences between Blacks and Whites, spanning Duncan (1968) to Yamaguchi (2009). Together, this literature suggests the need for a GGC analysis that accounts for ethnicity as well as location. Note that this applies across countries as well as within countries.

4.3. Temporal Gatsby Curves

While the GGC originated as a cross-sectional relationship, many theories of the curve conceive of it as a temporal relationship within an economy. For the United States, some of the early direct evidence on a temporal GGC appears in Aaronson & Mazumder (2008). This paper finds positive covariation between the IGE and two direct measures of cross-sectional inequality, that is, the 90/10 income ratio and the share of income accrued by the top 10%, as well as an indirect measure of income inequality, the college wage premium. This type of evidence, naturally, would require that the well-documented increases in inequality over the last 40 years are associated with reductions in mobility. Findings on change in mobility depend on how mobility is measured. While Davis & Mazumder (2022) argue that relative mobility has increased, Chetty et al. (2014b) come to different conclusions. In contrast, both Davis & Mazumder and Chetty et al. (2017) concur that absolute mobility, defined as the probability a child equals or exceeds a parent's income, has

[21] The social classes in this framework span professionals, proprietors, skilled workers, unskilled workers, and agricultural workers.

[22] Blume et al. (2015), argue, for example, that the primitive interactions structure in social models should be a population-wide sociomatrix, with intensities of the elements of the sociomatrix corresponding to various theories.

declined. These differences reflect the crucial importance of exercising care in defining mobility. With respect to measuring mobility, absolute measures can be affected by aggregate economic growth, which is a different force from mobility in a stationary economy. In contrast, relative measures can indicate no mobility even if different families are converging to a common steady state (see Bernard & Durlauf 1996).

Bloome (2015) moves empirical work on a US GGC to the study of individual-level data in ways that also address temporal trade-offs. This study considers a variant of Equation 5, which includes the Gini coefficient as an independent regressor and in which $\psi(x_{it}) = \kappa_0 + \kappa_1 Gini_{int}$, where $Gini_{int}$ denotes the Gini coefficient measured at the level of location n in which i resides at time t; states, counties, and commuting zones are considered. A systematic exploration of results under different assumptions concludes that there is little evidence that intergenerational mobility magnitudes are affected by inequality at the different levels studied.

Durlauf & Seshadri (2018) explore analogous regressions, except that they conduct the analysis at the census tract level, use the variance of log income as the inequality measure, and additionally employ the mean income of census tracts as an additional locational variable. That paper finds some evidence that the mean income level affects the level of offspring income but follows Bloome (2015) in finding little evidence that the variance of aggregate income matters for mobility. The mean income was the source of social influences in the theoretical framework of neighborhood effects used in Durlauf & Seshadri (2018); their results can be construed as supportive of their theoretical framework. However, as is seen in Durlauf (1996a), the logic of social models includes a role for higher moments of neighborhood characteristics. Thus, the failure of either the Gini or log variance to be predictive of persistence is possibly a challenge to the social framework. We note that a limitation of both Bloome and Durlauf & Seshadri is that the specifications in the empirical work are not theoretically motivated and may have low power to find phenomena such as poverty or affluence traps for reasons discussed earlier.

4.4. Mechanisms

Finally, there is a body of empirical work that assesses the role of mechanisms that can produce a GGC.

4.4.1. Education. The theoretical models we have described all give educational inequalities a key role in mapping inequality to mobility. Unsurprisingly, the empirical work on Great Gatsby Curve mechanisms has largely focused on education.

Jerrim & Macmillan (2015) systematically explore the role of education in explaining the cross-country findings on the GGC. Intergenerational persistence is measured by the projection coefficient β, where the offspring income is projected against the highest level of parental education in a modification of Equation 2; that is, the income effects of parental education are the concept of mobility under study. The authors consider auxiliary regressions in which (*a*) offspring education is projected against parental education to produce an educational mobility parameter λ and (*b*) offspring income is projected against offspring education to produce a returns to education parameter λ. This leads the authors to decompose overall persistence as $\beta = \delta\lambda + \delta$, where δ measures the part of overall persistence that does not work through the effects of parental education on offspring income. Overall persistence β, as well as each of its components, is shown to positively covary with income inequality, measured by the Gini coefficient. The paper also identifies some evidence that countries with higher income inequality invest less in public education, suggesting a political economy channel as well.

Halter (2015) investigates how differences in policies that affect education across countries impact intergenerational earnings persistence. Halter studies taxation (in particular, the progressivity of public financing of education) and educational expenditures (both private and public) from a set of 11 developed countries from northern and southern Europe and North America. The analysis employs a family investment model with private and public financing for education where, upon young adulthood, an individual decides whether to go to college. The government taxes labor income with a nonlinear tax rate (allowing for various degrees of progressivity) and finances education at both the pretertiary and tertiary levels. Parents are able to transfer assets to their children, and their offspring are also able to borrow to finance college education. Halter finds that private investments in human capital accounts for 73% of the estimated intergenerational earnings persistence in the United States. If this channel were to be shut off (so that individual familial investments in education were not possible), the IGE for the United States would be well below that of the Scandinavian countries, which were among the most mobile in his sample. Because public expenditures in education were substitutes for private educational investments and also served to alleviate borrowing constraints for poor families, greater tax progressivity then led to greater mobility. In his model, if the US tax system is calibrated to that of Denmark (the highest-mobility country in the sample), then the United States' IGE would be reduced from a calibrated benchmark of 0.47 to 0.299, or about 53% of the difference between the United States and Denmark.

The role of education in producing a dynamic GGC for the United States has also been explored. Kearney & Levine (2016) use the National Longitudinal Survey of Youth (NLSY) to demonstrate that income inequality, using fiftieth/tenth-percentile income ratios, is predictive of high school dropout rates at both the state and metropolitan statistical area levels, with effects much more pronounced among boys than girls. Interestingly, they do not find that the relationship is robust to the magnitude of the high school graduate/nongraduate wage gap. Nevertheless, their work again emphasizes the importance of the education mechanism in generating the GGC—because inequality negatively affects high school completion rates, especially among low–socioeconomic status individuals, it also acts to lower rates of upward mobility.

Bloome et al. (2018) provide a systematic analysis of the education inequality/income inequality nexus. Using NLSY data, these authors find that there are complex forces in the American case. As is well known, in the United States, the college wage premium has increased, as has cross-sectional educational inequality, measured by high school completion and college attendance and completion. These factors enhance income inequality. However, the authors find that other factors, including the expansion of college education among the children of low-income families and a reduction of the predictability of offspring income by parental income, diminish income inequality. The net effects of these countervailing forces, the authors conclude, have led to stability in intergenerational mobility despite the changes in educational inequality and the college wage premium.

The paper's conclusion that mobility has been constant for the United States represents a challenge to claims that an intertemporal GGC is present in the United States. However, it is important to note two things. First, it is possible for a GGC to be present if one considers both time and space variation. This matters if the mechanism linking inequality to persistence is operating at units smaller than the United States as a whole. Second, the very interesting decompositions done here show how a GGC can emerge. The constancy of the IGE estimate in the paper occurs because of a balance of forces. If greater income inequality exacerbates heterogeneity in elementary and high school educational quality, this may not be offset by greater expansion of college education or continuing reduction of offspring income predictability by parental income.

Finally, there is work on the evolution of the interaction between college graduation and intergenerational persistence. A classic result in the study of occupational mobility is the attenuation of occupational persistence for college graduates (Hout 1988). Torche (2011, 2018) shows how the current relationship between college and persistence is nuanced. Whether looking at occupations or income, the predictability of offspring outcomes is lowered when one moves from low educational attainment to college completion, but it reemerges among advanced degree holders. Torche argues that parental influences on college quality and choice of college major play significant roles in this relationship.

4.4.2. Family structure. A distinct body of work has linked income inequality to family structure, providing a natural channel to intergenerational persistence. Kearney & Levine (2014) and Cherlin et al. (2016) explore the relationship between local inequality and family structure. Kearney & Levine consider use state measures of the ratio of household incomes at the fiftieth and tenth percentiles to measure lower tail inequality and find that higher inequality is associated with higher rates of nonmarital childbearing among adolescents. Cherlin et al. study fertility dynamics, including marital versus nonmarital fertility as well as whether nonmarital fertility involves a partner, using inequality measures at the county level. This analysis examines local income inequality measures by combining both the fiftieth/tenth and ninetieth/fiftieth ratios with measures of labor market inequality, including (*a*) unemployment and (*b*) indices of middle-skilled jobs that capture the extent to which a high school graduate will be able to earn an income that is 1.3 times the poverty threshold for a family of two. Gender differences in fertility are carefully distinguished, as are gender differences in labor market conditions. Income inequality is shown to reduce the likelihood of marriage prior to first birth; evidence on the effects of childbirth for partnered couples is also found, albeit somewhat weaker.

5. CONCLUSIONS

Our discussion of the GGC illustrates the breadth of theoretical and empirical work stimulated by the early findings that there are positive associations between cross-sectional inequality and intergenerational persistence. Where do we see the greatest need for additional research?

First, much more work is needed to understand how different measures of inequality and mobility produce a GGC. As emphasized in Section 2, there is a single stochastic process from which Gatsby-type regularities are produced, and the robustness of findings to different inequality and mobility measures is not well understood. The development of robust evidence is likely to involve more general notions of positive dependence than are used in the current statistics-based approach.

Second, as we have emphasized, there are distinct perspectives on the GGC that have emerged in the economics, sociology, and psychology literatures. In our view, one implication is the need to integrate ideas concerning aspirations and cultural capital as sources of the GGC into formal economic models. Similarly, we see much value in integrating income-based, educational, and occupational measures of inequality, both cross-sectional and temporal, into a common framework for understanding the stochastic process of income that produces the constituents of the GGC; one goal of such integration would be the development of a decomposition of the GGC's measures according to contributions of various mechanisms as well as an assessment of the role of interactions between them. We see potential analogies to the type of work initiated by Bowles & Gintis's (2002) decomposition of the sources of intergenerational mobility, but nonlinearities will presumably be present in the way mechanisms influence the inequality/mobility relationship.

Third, we see the need for a much more systematic investigation of how transitional dynamics and economic growth interact with inequality/persistence comparisons. Comparisons of internal GGCs for the United States and China, for example, are not especially meaningful in light of the fact that one economy is experiencing radical qualitative transformation and the other is not. But more than that, a GGC around a steady state means something quite different from one that emerges in transition toward a steady state. Zhou & Xie (2019) are especially enlightening on this point, and they show that mobility in China has increased from the vantage point of the ability to move from the agriculture sector to the nonagricultural sector but in contrast has decreased based on conventional measures of social class mobility within nonagricultural sectors. Similarly, the meanings of absolute and relative mobility are very different in a growing economy versus a stationary one, a theme seen in Durlauf (1996a,b). Here, the key theoretical point is that, in growing economies, the support of incomes is growing, which allows for qualitatively different mobility dynamics than in stationary economies. Econometric tools developed by Phillips & Sul (2007, 2009) can be brought to bear on better understanding these issues. There are natural applications of longstanding ideas in the sociology literature on exchange versus structural mobility that should be applied here as well. Song et al. (2020) and Karlson & Landersø (2021), for example, show how long-run educational dynamics influenced mobility in the United States and Denmark, respectively, in ways that need to be decomposed from the Gatsby mechanisms we have discussed.

For these reasons, we expect Great Gatsby Curve research to continue to flourish.

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