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In Praise of Snapshots

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ABSTRACT

In Praise of Snapshots*

The conventional justification for moving from income distribution to intergenerational mobility analysis is that the movie encompasses the snapshot and is normatively superior as the basis for assessing policy. Such a perspective underpins many an argument for shifting the focus from income redistribution, which is said to equalize outcomes, to equalizing opportunity by increasing mobility through such policies as equal provision of public education. This paper argues that this perspective can be misleading. It shows that normative evaluation of mobility in any event often falls back on a snapshot perspective. Further, the snapshot itself often contains the seeds of the movie, as posited in the Great Gatsby Curve. Income redistribution can itself improve mobility even if that is the only objective. The paper thus speaks in praise of snapshots.

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1   Introduction

The conventional justification for moving from income distribution to intergenerational mobility analysis is that it is a move from static to dynamic, from outcome to process, indeed from snapshot to movie. This justification and this perspective have served us well and have generated a vast positive and normative literature. Inherent in these characterizations and in this literature is the presumption that for positive analysis dynamic mobility encompasses static inequality and has additional elements which are crucial. After all, isn't a movie simply a sequence of snapshots? Doesn't the movie have all the information which no single snapshot can give us? On the normative front is the claim that focusing on a snapshot can also mislead us. As Stokey (1998) puts it:

> I am going to take the position that if economic success is largely unpredictable on the basis of observed aspects of family background, then we can reasonably claim that society provides equal opportunity. There still might be significant inequality in income across individuals, due to differences in ability, hard work, luck, and so on, but I will call these unequal outcomes.

Thus, it is argued, the distinction between outcomes and opportunity is central to normative judgement, and moreover it is the movie rather than the snapshot which provides a handle on opportunity.

Despite this pedigree of intuitions, recent years have brought forth a questioning. The 'movie is made up of a sequence of snapshots' metaphor is appealing but perhaps itself mechanical and misleading. What if each snapshot has within it the seeds of the next snapshot? Then the snapshots are the harbinger of the movie rather than merely its constituent parts. At the very least, the two interact. Or the two are themselves the outcomes and manifestations of underlying processes which it is our task to uncover through positive analysis and to evaluate through normative exploration.

This alternative perspective was brought to the fore powerfully in popular discourse by the late Alan Krueger (2015) through what he christened the 'Great Gatsby Curve':

> Building on the work of Miles Corak, Anders Björklund, Markus Jantti, and others, I proposed the 'Great Gatsby Curve' in a speech in January 2012. The idea is straightforward: greater income inequality in one generation amplifies the consequences of having rich or poor parents for the economic status of the next generation.

Krueger famously plotted estimates of income mobility against estimates of snapshot inequality across countries and found a negative relationship. Thus, in this view, the snapshot matters. It affects the transition from the current period to the next, and hence the whole movie. Of course, the transition then determines the next snapshot, and on we go with the dynamic process. But it does not make sense, in this way of looking at things, to give the dynamic a precedence and to see it as causing the period by period outcomes. In fact, it is the other way around or, at best, the snapshot and the movie are co-determined.

A similar corrective is needed on the normative front. One may ask *why* unpredictability of economic success based on current outcomes has normative power. Some may stand their

ground at this point and simply appeal, with varying degrees of success, to our moral intuitions the way Stokey (1998) appears to do in the quote above. And yet when pushed, many would come to the notion that persistence of income or wealth or education status over time perpetuates dynastic inequality, by which is meant some discounted aggregate of income over time for each set of individuals connected by birth. As often happens in economics, wellbeing over time is converted into an intertemporal aggregate and it is the distribution of this aggregate which is assessed. Although not exactly that, this is akin to comparing 'snapshots', now of aggregated intertemporal wellbeing.

The object of this paper is to review the interplay between the static and the dynamic and to thus unpack the Great Gatsby Curve (GGC) and its causal and normative interpretations. It will be seen that although a very interesting new area of analysis has been opened up, there is still much left to be clarified and investigated, both on the positive and on the normative front. Section 2 starts with positive analysis and Section 3 takes up normative considerations. Section 4 compares and contrasts two policy instruments—direct income redistribution and equal pubic provision of education—as between their impacts on inequality and on mobility. Section 5 concludes.

2   Positive analysis: from mobility to income distribution and back[1]

Consider the usual income transition equation between log income y of generation t-1 and generation t:

$$y_t = \beta y_{t-1} + \varepsilon_t; \qquad \varepsilon_t \text{ is } N(0, \sigma^2_\varepsilon)$$

(1)

where ε_t is a stochastic disturbance term, initially assumed to be iid and normal with mean zero and variance σ^2_ε. The effect of generation t-1's outcome on the outcome for generation t, the intergenerational elasticity of income (IGE), is β. With these assumptions it follows that:

$$\sigma^2_t = \beta^2 \sigma^2_{t-1} + \sigma^2_\varepsilon$$

(2)

where σ^2_t is the variance of y_t. This variance of log-income is used as the measure of snapshot inequality in this literature.

The equations and the process go back at least as far as Gibrat (1931) who posited it as describing the evolution of firm size. In the post-war period it was used to great effect to study the evolution of income inequality and its links to mobility, for example by Creedy (1974) and by Hart (1976). Clearly, from equation (1) IGE or β can be interpreted as a measure of income immobility. The higher is β the greater the influence of parental income on children's income. With this interpretation equation (2) gives us the link from mobility to snapshot inequality. Taking σ^2_ε as given, if β is greater than or equal to unity then inequality explodes, increasing every period. The increase is greater the greater is the degree of immobility. If, however, β is less than 1 then inequality falls every period, converging to a steady state value:

$$\sigma^2_y = \sigma^2_\varepsilon /(1-\beta^2)$$

(3)

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[1] This section draws on Section 2 of Kanbur (2018).

3

Further, the lower is β, in other words the greater is mobility measured in this fashion, the lower will be the steady state inequality.

Thus equation (3) predicts a negative relationship between snapshot inequality and the measure of dynamic mobility. This is of course the correlation posited in the Great Gatsby Curve. But here the causality runs from β to σ^2_y. From the movie to the snapshot. Increase mobility, if you can, and you will lower steady state inequality. There is no feedback from the snapshot to mobility as posited in the model. But perhaps such a feedback could be brought in by addressing the usual iid assumption on ε_t? If ε_t is AR(1) then:

$$\varepsilon_t = \theta\varepsilon_{t-1} + \xi_t ; \qquad \xi_t \text{ is } N(0, \sigma_\xi^2) \tag{5}$$

$$y_t = (\beta+\theta)y_{t-1} - \beta\theta y_{t-2} + \xi_t \tag{6}$$

It can be shown (Solon 2004) that for this second order autoregressive process the steady state variance is given by:

$$\sigma^2_y = \{(1 + \beta\theta) \sigma_\xi^2\}/\{(1 - \beta\theta)[(1 + \beta\theta)^2 - \beta^2]\} \tag{7}$$

The impact of mobility on inequality now interacts with the persistence of shocks as measured by the magnitude of θ. It can be shown as before that the higher is the immobility parameter β the greater will be steady state inequality, and the same is true for the persistence parameter θ. Further, there is an interaction term so that the marginal impact of each of these dynamic parameters is greater the higher the value of the other parameter. So, this is causality from the dynamic parameters β and θ to the static outcome σ^2_y. The characteristics of the movie determine the snapshot.

So far, then, the GGC correlation between inequality and mobility has been vindicated by the theory, but the causality is from mobility to inequality, and thus not in the direction that Krueger (2015) posited when he said 'greater income inequality in one generation amplifies the consequences of having rich or poor parents for the economic status of the next generation.' It should be clear that such an implication could not in fact be drawn from equation (1) or equation (6) because in those models the outcome for the present generation is *linear* in the outcomes for the past generation or generations. If there was to be a snapshot redistribution of income in the present generation, this would affect snapshot inequality, but not intergenerational mobility as measured by β or θ—these are constant across income by assumption.

But what if β in the simplest model (1) were not constant but itself varied with y? Then of course there would not be a convenient single constant measure of mobility. But we could, for example, use the mean value of β in the cross section as a measure of overall mobility. Now there would in general be an impact of greater snapshot inequality on mobility so measured. In particular, if β were a concave (convex) function of income then a mean preserving spread in snapshot income would decrease (increase) the mean value of β and thus increase (decrease) the measure of overall mobility. A similar set of arguments can be made around equation (6), albeit the analytics would be more complicated.

Viewed in this way, the central empirical question becomes whether the intergenerational elasticity of income is itself a function of current income, and on the shape of this relationship. In their excellent paper Bratsberg et al. (2007) build on the work of Becker and Tomes (1979)

and Solon (2004) to show that microfounded models of parental investment in children could predict either a concave or convex relationship between the children's income and parental income, depending particularly on the nature of credit constraints. It should be clear intuitively, and can be shown formally, that credit constraints will make parental resources a stronger determinant of investment of children and therefore outcomes for children—in other words, β in equation (1) is higher. Becker and Tomes (1979) argued that if credit constraints affect poorer parents more, then the relationship between children's income and parents' income will be concave.

However, Bratsberg et al. (2007: C76) make the case that the relationship could be convex, as follows:

> Suppose that all families are borrowing-constrained, possibly because the optimal level of investment is higher for children with high ability … Suppose now that educational policies and institutions are designed in such a way that, for lower levels of human capital formation, access to education services is characterised by equal opportunity. In this meritocratic case, the … flatter gradient applies to the lower rather than to the higher earning parents. In this scenario, the relationship between child and parent earnings is convex rather than concave.

Bratsberg et al. (2007) rely on policy interventions to generate convexity rather than properties of the market. But the basic point remains that the nature of the non-linearity is an empirical question.

Is there an empirical consensus? In terms of global patterns, the answer seems to be 'no'. A decade ago, Bratsberg et al. (2007) reviewed the literature of the time and found widely varying conclusions across countries, from concavity (Mazumder 2005) to convexity (Corak and Heisz 1999; Behrman and Taubman 1990), to no relationship (Couch and Lillard 2004: 190–206, for Germany). Their own empirical work came to similar conclusion:

> It turns out, however, that the functional form of these intergenerational relationships varies widely across countries. While linear regressions fit the US — and even the UK — data reasonably well, the … relationship between sons and fathers log earnings in the Nordic countries is not linear but rather convex. Specifically, in the Nordic data the relationship starts out flat, implying that whether sons are born into very poor or moderately poor families has little impact on their own expected adult earnings.' (Bratsberg et al. 2007: C73).

The literature has of course advanced in the last decade, and many methodological issues have been aired and addressed. The massive research programme of Raj Chetty and his colleagues has unfolded. But it would perhaps be fair to say that the basic patterns, at least the fact that there are large variations across countries, remain unchanged. Thus Chen, Ostrovsky and Piraino (2016) conclude:

> The pattern of nonlinearity observed in the Canadian data seems to be more in line with the Nordic evidence: a modest intergenerational relationship in the lower segments of the fathers' distribution and an increasingly positive correlation in middle and upper segments (Bratsberg et al. 2007). The United States, by contrast, exhibit an

almost perfectly linear relationship between children's and parents' ranks in the income distribution. (Chetty et al. 2014)

But the variation across countries is perhaps not surprising because the estimates of IGE from observed outcomes are a combination of market forces and policy interventions. The market forces may themselves differ across countries. For example, Grawe (2004) argues that the specific type of non-linearity in the earnings function may determine concavity or convexity rather than the presence or absence of credit constraints. And Bratsberg et al. (2007) argue that policies might overcome credit constraints in some countries but not in others. Policy variation in turn raises the question of why the intervention is deemed desirable in the first place—why precisely is it that a low IGE is normatively desirable? I now turn to this question.

3   Normative analysis: snapshots and movies

The normative interpretation of positive analytics measures of mobility, like the IGE, has of course been much studied, from Shorrocks (1978a, b), through Fields and Ok (1999), to Jäntti and Jenkins (2015). Cowell and Flachaire (2019) is only the most recent extension to a vast literature on this topic. In this paper I want to draw from this literature the theme that while it seems that the dynamic perspective of the movie is generally accepted as superior for normative evaluation, in fact beneath the surface there is often a concern with inequality— not exactly a snapshot but something akin to it.

Let us begin with equation (3) which gives us a causal relationship between the dynamics inherent in the IGE and the snapshot inequality outcome measured by σ^2_y (equation (7) tells the same story in the more general setting of an autoregressive error term). An aggressive strand of the normative and policy discourse is not concerned with σ^2_y at all. Rather, the normative focus is on reducing β (increasing mobility) even if, for example, the tradeoff was that σ^2_ε would increase by so much that the combined effect would be for σ^2_y to increase. Stokey (1998) exemplifies this strand, but it is ever present in the policy discourse, usually under the moniker that equality of opportunity is preferable to equality of outcomes:

> From this perspective greater mobility is socially desirable because equality of opportunity is a principle that is widely supported. This is relevant because independence of origins and destinations is consistent with inequality of outcomes being relatively equal or unequal. (Jäntti and Jenkins 2015: 815)

There is a strong philosophical strand advancing equality of opportunity, and thus its manifestation of mobility in the present context, as the dominant normative goal (see the comprehensive survey by Roemer and Trannoy 2015). However, there is also a strand of consequentialist rather than deontological argument as to why greater mobility is preferable because of its impact on snapshot inequality in different senses. The most obvious sense has already been alluded to. From equation (3) even if our normative objective was to focus on snapshot inequality, mobility is not at all irrelevant. We can reduce σ^2_y by reducing σ^2_ε but also by reducing β, if we had the policy instruments to do so.

But there is another sense in which mobility affects inequality, and it is to do with evaluations of time profiles of outcomes across generations. Shorrocks (1978b: 377–78) provides a clue when he argues as follows about the role of the accounting period:

> There are reasonable grounds ... for supposing that the existence of mobility causes inequality to decline as the accounting interval grows. Furthermore, intuition suggests that the extent to which inequality declines will be directly related to the frequency and magnitude of relative income variations. If the income structure exhibits little mobility, relative incomes will be left more or less unaltered over time and there will be no pronounced egalitarian trend as the measurement period increases. In contrast, inequality may be expected to decrease significantly in a very (income) mobile society … In essence, mobility is measured by the extent to which the income distribution is equalised as the accounting period is extended.'

Thus given individual time profiles of income, a longer time period of aggregation will have differential impact on snapshot inequality depending on the mobility. Indeed, Shorrocks (1978b) develops the argument that this impact can itself be used as a measure of mobility. A similar point was made by Grootaert and Kanbur (1995: 610) for poverty measurement with different accounting periods, in one of the first mobility studies using panel data from sub-Saharan Africa (for Cote d'Ivoire):

> … 'two-period' poverty is in general less than the larger of the two snapshot poverty figures for each panel. In fact, in some cases two-period poverty is in general less than both of the snapshot figures … What this suggests is that there is considerable mobility in the panels, particularly across poverty classes.

Such intertemporal aggregation was also introduced by Atkinson and Bourguignon (1982), indirectly and by implication, through their social welfare-based approach to ranking multidimensional distributions of economic outcomes. The dimensions could of course be interpreted as different time periods, bringing us to social welfare rankings of time profiles of outcomes across the generations. A simple way to present the issue, also introduced by Shorrocks (1978a), is to ask on what normative principle we would compare the two transition matrices:

$$A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \quad \text{and} \quad B = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix} \tag{8}$$

between two outcome states across generations. Intuitively, at a glance, B is more mobile than A. But why is it preferable? One might argue that dynasties are not permanent in B, which shows an extreme case of churning—'clogs to clogs in three generations.' But why is that preferable? Ultimately, I think, one is pushed to compare inequality of some intertemporal aggregate across the two dynasties, as between A and B. Each generation takes its turn in the top spot with B, hence intertemporal inequality will be smaller than in A.

But Shorrocks (1978a) also presents us with another comparison, of B with:

$$C = \begin{bmatrix} 1/2 & 1/2 \\ 1/2 & 1/2 \end{bmatrix} \tag{9}$$

This transition matrix shows independence of future prospects from the current outcome. Indeed the prospects are identical across outcome states. Surely this qualifies as 'equality of opportunity' and thus must be better than B (although both B and C are better than A)? One

way to answer this question is to ask what long-run inequality would look like under these two transition matrices. With a discount factor given by r (less than one), and a ratio of snapshot incomes given by k (greater than one), it is shown by Kanbur and Stiglitz (2016) that the 'constant churn mobility' of matrix B gives lower dynastic inequality than 'equality of opportunity mobility' of matrix C. The intuition for this is straightforward. With discounting, the starting point matters. The generation starting with higher income will keep that advantage even if prospects from then on are independent of incomes. The only way to counter the initial advantage it to compensate by giving the lower initial state with better prospects.

This need to compensate the initial disadvantage of low-income states also comes through in the sub-literature on mobility dominance, where a precise intertemporal social welfare function is specified, and the question is asked which transition matrices will give higher social welfare. One of the best-known papers in this tradition is that by Dardanoni (1993: 390):

> In this paper we have considered the ranking of mobility matrices by deriving the lifetime prospects under different transition mechanisms and aggregating them with a [Social Welfare Function] which gives greater weight to individuals starting at a lower position ... This approach may be considered as the intertemporal counterpart to the static inequality ranking of income distributions by the Lorenz curve … The equivalence of our ranking with the 'permanent income' Lorenz ranking ... gives support to the claim that this approach is the natural extension of [conventional static inequality measurement] approaches.

Dardanoni (1993) makes explicit what is implicit in this part of the literature, that in effect the comparison of time profiles of income, the movie, is converted into a comparison of the inequality in intertemporal aggregate like permanent income, which is akin to a comparison of snapshots—indeed, the same methods from the static literature are used once the conversion is completed. As Jäntti and Jenkins (2015: 813) state in their survey paper: 'Mobility can therefore be characterized in terms of the extent to which inequality in longer term income is less than the inequality in marginal distributions of period-specific incomes.' We are thus back to evaluating snapshots, granted of a particular type, to get a normative handle on the movie.

The way to avoid being led into snapshot comparisons of one type or another is to studiously focus only on the dynamic properties of the income generation process, in particular on the degree of independence of future outcome from the current state. Put another way, the degree of independence of children's outcomes from parents' status is the only thing that matters— all else is extraneous. As noted earlier, this is one part of a broader argument on equality of opportunity. As formulated by Roemer (1998) this argument rests on the distinction between circumstances and effort as determinants of outcomes for an individual. Circumstances are those factors over which the individual has no control. Effort is that over which the individual does have control. Inequality of opportunity is that variation in outcomes which is attributable to circumstances. Since parental status is something over which an individual has no control, it follows that independence of outcomes for children from parental status is a necessary condition for equality of opportunity. Indeed, if this was the only circumstance, that is all that would matter. Hence the focus on mobility measures, and hence the strong statements as found in Stokey (1998).

But the strong stance on equality of opportunity, as opposed to equality of outcomes, is not without its critics. There are empirical and conceptual critiques, on whether we can ever truly separate out circumstance from effort in determining outcomes (Kanbur and Wagstaff 2016: 131-48; Wagstaff and Kanbur 2015) and in the use of policy instruments. Such attempted separation of 'equality of outcomes' policy and 'equality of opportunity' policy is taken up in the next section.

4   Policy: income or education?

An often-heard refrain in the policy discourse is that policy should focus not on equality of outcomes but on equality of opportunity. Its manifestation in the current context would be to focus on improving mobility, by which is meant making children's economic prospects independent of parental economic status. This would satisfy the direct normative objective of equality of opportunity but it would also, according to equation (3), reduce long-term equality of outcomes as well. In terms of concrete policy instruments, a distinction tends to be drawn between progressive taxation and transfers of income which reduce snapshot income inequality, and policies which provide an equal educational start for all. Redistribution of income is held to have detrimental incentive effects, but the primary reason for its disavowal is that it is targeting the wrong objective—the snapshot rather than the movie. Equalizing education provision, on the other hand, targets equal opportunity and so is to be preferred.

This narrative, common as it is and well-embedded as it is, needs to be looked at carefully and deconstructed, not least because it marks a slippery slope towards dismantling progressive income tax and transfer policy. At the very least, we will have to think about how the resources for public provision of education are raised—will that be through progressive taxation? As important is the role of parental resources and inputs in determining the educational achievements of children. If parental resources are important, might not their inequality also contribute to inequality of educational outcomes and thus equality of opportunity? And what about the Great Gatsby Curve? If there is indeed a causal relationship from income inequality to mobility, should income inequality not be targeted instrumentally, at least?

In a paper prepared for the UNU-WIDER research project The Economics and Politics of Taxation and Social Protection, Haaparanta et al. (2019) use optimal taxation analysis in the tradition of Mirrlees (1971) to assess the balance between progressive income taxation and public education provision, even when the objective is equality of opportunity, as measured by inequality of educational achievements. Their Proposition 1 (p. 9) is instructive:

> A government that only cares about inequality in educational outcomes should also use progressive income taxation, in addition to possibly subsidizing education. The tax system is more progressive when the increase in educational attainment is highly sensitive to increases in income, especially among those at the bottom of the educational distribution.

The result is derived in a model in which educational outcomes depend on both public and parental inputs, and parents invest in the education of their children taking into account public provision and the tax regime. The intuition behand the proposition should be clear. Education is a normal good, and richer parents invest more in education for their children for any given level of public provision. Raising public provision will equalize education ceteris paribus, but

so will income redistribution. And in any case, raising public provision will need resources which are in turn raised through taxation—doing this through progressive taxation will further enhance educational equality.

Proposition 2 of Haaparanta et al. (2019: 11) addresses the question of the optimal level of provision of public education:

> Optimal public provision of education for a government whose social welfare function is motivated by [equality of opportunity] concerns is increasing in the relative impact of public provision versus additional income on educational attainment. The provision rule suggests distorting the public provision upwards if [parental education inputs] are more sensitive to public provision at the lower end of the distribution.

The proposition raises the general question of the impact of public and parental inputs in educational outcomes. While there is now broad consensus that parental resources are strongly associated with children's educational outcomes, there is less agreement whether parental and public inputs are substitutes for or complements to each other. Does public provision crowd out private inputs, and what are the effects at different income levels? Pelzman's (1973) theoretical proposition introduced the notion that public provision could crowd out private inputs. But the evidence has been mixed. For example, Cohodes and Goodman (2014) find crowding out effects while Castelman and Long (2013) do not. Zero or only small degrees of substitution have been found for pre-school programmes (Cascio and Schanzenbach 2013, for the US; Brinkman et al. 2017, for Indonesia). Even here, results on effects across the income distribution are mixed. Cascio and Schanzenbach (2013) find strong crowding out effects at the upper end, while Brinkman et al find no differences among rich and poor.

Public and private inputs to education are also incorporated into Solon's (2004) analysis, following on from the Becker and Tomes (1979) model. In Solon's (2004) model income is taxed at rate τ and it is assumed that public expenditure provides the equivalent of G_i to educational input, to be added to parental input. Solon then characterizes 'a sort of relative progressivity in public investment in children's human capital' by assuming the following relationship:

$$G_{i,\,t-1}/[(1-\tau)Y_{i,\,t-1}] \;=\; \varphi - \gamma\, y_{i,\,t-1} \tag{10}$$

where Y is income and y is log income. As Solon (2004) continues: 'With $\gamma > 0$ the absolute public investment may or may not be greater for children from high-income families, but the ratio of public investment to parental after-tax income decreases with parental income. The more positive γ is, the more progressive is the policy.' Not surprisingly perhaps, Solon shows that 'the intergenerational elasticity is greater as … public investment in children's human capital is less progressive (γ is less positive).'

Income is only taxed proportionately in Solon's model, and indeed there is no overall government budget constraint which relates total public provision to the tax rate. And, further, public education is not a pure public good but can be targeted at different income levels—in effect, a transfer to poorer parents relative to the tax revenue raised from them. In the Haaparanta et al. (2019) model public educational expenditure is indeed a pure public good, thus the focus on complementarity or substitutablity of public and private inputs through parental decision-making. However, it should be clear intuitively that despite its dynamic

structure in terms of the evolution of inequality, the policy side of the Solon (2004) analysis is quite akin to changing the snapshot distribution of income—the more progressive is the transfer of human capital, the greater will be the intergenerational elasticity of income. As for the relative balance between education and taxation, Solon's analysis is not focused on that, but Haaparanta et. al 's propositions tell us that income taxation should be progressive even if the objective is equality of educational outcomes. Thus the policy usually characterized as (and perhaps derided by some) as targeted to equality of outcomes, turns out to be instrumental in targeting equality of opportunity.

5   Conclusion

Income redistribution through taxation and transfers is under renewed attack in the policy arena. The conventional argument against such policies is through their effect on incentives. Economists have contributed to this caution by jointly modeling equity and efficiency as in the Nobel Prize-winning analysis of Mirrlees (1971). Indeed, the Mirrlees Review, conducted under the auspices of the Institute for Fiscal Studies (Mirrlees et al. 2011), is famously said to have been the intellectual force behind the reduction of the UK's top income tax rate from 50 per cent to 45 per cent in 2013 by then Chancellor of the Exchequer, George Osborne. The policy change and the analysis underlying it were criticized by Atkinson (2015: 184–85), but the incentives case for less progressive taxation is now commonplace.

However, a second argument against income redistribution has now gained ground. This argument relies not on inefficiency of income redistribution but on its normative illegitimacy. Policy focus, it is argued, should not be on inequality of outcomes but on inequality of opportunity. This position has been advanced not only by conservative philosophers and politicians, but by economists who would be regarded as egalitarian in their stance (e.g. Roemer 1998). In this perspective, only that part of income inequality which is attributable to inequality of opportunity is a legitimate policy target, and policy should address those inequalities directly rather than redistribute income. Add to this the next step in the argument, that dependence of children's outcomes on parental economic status is a clear indication of inequality of opportunity, and we are led inexorably to the conclusion that policy should focus not on redistributing parental income but improving intergenerational mobility. At the very least, the balance should shift away from income redistribution to other policies, such as education provision, which target mobility directly.

The burden of this paper's argument is that such a policy conclusion is not warranted. The positive analysis of mobility, both from economists and from interdisciplinary perspectives (Addison, Hulme and Kanbur 2009), is of course welcome. But the leap from such analysis to a reduction of focus on direct income redistribution is not justified, neither in the positive nor in the normative discourse. The distinction between snapshot and movie, and the elevation of movie over snapshot, is too readily made. Often when we think we are focusing on evaluating the movie we are in fact using methods from snapshot analysis. Theoretical and empirical arguments underpinning the Great Gatsby Curve suggest that the snapshot contains within it the seeds of the movie. And direct redistribution of income turns out to be an integral part of achieving objectives like equality of educational outcomes which are proxies for greater mobility and for equality of opportunity. Thus to set against Stokey's (1998) argument that we should focus not on outcomes but on opportunity, we have the argument of the Payne (2017: 173) that,

> … the fundamental truth that needs to be faced is that those with advantages must give up some of them to make space for those who start off with disadvantages. If we really want more mobility, improving equality of *opportunity* is a red herring—what matters is improving inequality of *outcome*. Improving mobility rates will do little to improve social inequality, but reducing social inequality is the sure way to achieving greater social mobility.

Perhaps I protest too much. Perhaps all this is well known and well understood and there is no danger of a focus on mobility leading to a shift away from redistributive taxes and transfers to reduce inequality directly. But I think a corrective is in order. I write in praise of snapshots.

References

Addison, T., D. Hulme, and R. Kanbur (2009). *Poverty Dynamics: Interdisciplinary Perspectives*. Oxford: Oxford University Press.

Atkinson, A.B. (2015): *Inequality: What Can Be Done?* Cambridge MA: Harvard University Press.

Atkinson, A.B., and F. Bourguignon (1982). 'The Comparison of Multi-dimensional Distributions of Economic Status'. *Review of Economic Studies*, 49(2): 183-201.

Becker, G.S., and N. Tomes (1979). An equilibrium theory of the distribution of income and intergenerational mobility, *Journal of Political Economy*, 87(6): 1153–89.

Behrman, J.R., and P. Taubman (1990). 'The intergenerational correlation between children's adult earnings and their parents' income: results from the Michigan Panel Survey of Income Dynamics'. *Review of Income and Wealth*, 36(2): 115–27

Bratsberg, B., K. Røed, O. Raaum, R. Naylor, M. Jäntti, T. Eriksson, and E. Osterbacka (2007). *The Economic Journal*, 117: C72-C92.

Brinkman, S.A., A. Hasan, H. Jung, A. Kinnell, and M. Pradhan (2017). 'The impact of expanding access to early childhood education services in rural Indonesia'. *Journal of Labor Economics* 35(S1): S305–S35.

Cascio, E.U., and D. Schanzenbach (2013). 'The impacts of expanding access to high quality preschool education'. *Brookings Papers on Economic Activity*, Fall: 127-92.

Castleman, B.L. and B.T. Long (2013). 'Looking beyond enrollment: The causal effect of need-based grants on college access, persistence, and graduation'. *Journal of Labor Economics,* 34(4): 1023–73.

Chen, W.-H., Y. Ostrovsky and P. Piraino (2016). 'Intergenerational Income Mobility: New Evidence from Canada'. *Economic Insights*, 059(June). Statistics Canada, Catalogue 11-626-X.

Chetty, R., N. Hendren, P. Kline, and E. Saez (2014). 'Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States'. *The Quarterly Journal of Economics,* 129(4): 1553–623.

Cohodes, S.R., and J.S. Goodman (2014). 'Merit aid, college quality, and college completion: Massachusetts' Adams Scholarship as an in-kind subsidy'. *American Economic Journal: Applied Economics,* 6(4): 251–85.

Corak, M., and S. Heisz (1999). 'The intergenerational earnings and income mobility of Canadian men: evidence from longitudinal income tax data'. *Journal of Human Resources*, 34(3): 504–33.

Couch, K.A., and D.R. Lillard (2004). 'Linear patterns of intergenerational mobility in Germany and the United States'. In M. Corak (ed.), *Generational Income Mobility in North America and Europe*. Cambridge: Cambridge University Press.

Cowell, F.A., and E. Flachaire (2019). 'Mobility and Mobility Measures'. Unpublished manuscript.

Creedy, J. (1974). 'Income Changes over the Life Cycle'. *Oxford Economic Papers*, 26: 405–23.

Dardanoni, V. (1993). 'Measuring Social Mobility'. *Journal Economic Theory*, 61: 372–94.

Fields, G.S., and E.A. Ok (1999). 'The measurement of income mobility: an introduction to the literature'. In J. Silber (ed.), *Handbook on Income Inequality Measurement*. Dewenter: Kluwer.

Gibrat, R. (193I). *Les Inegalites Economiques*. Paris: Sirey.

Grootaert, C., and R. Kanbur (1995). 'The Lucky Few Amidst Economic Decline: Distributional Change in Cote d'Ivoire as Seen Through Panel Data Sets, 1985-88'. *Journal of Development Studies*, 31(4): 603–19.

Haaparanta, P., R. Kanbur, T. Paukkeri, J. Pirttilä, and M. Tuomala (2019). 'Promoting Education under Distortionary Taxation: Equality of Opportunity versus Welfarism'. Helsinki: UNU-WIDER Working Paper 2019/18.

Hart, P. (1976). 'The Dynamics of Earnings, 1963-1973'. *Economic Journal*, 86: 551–65.

Jäntti, M., and S.P. Jenkins (2015). 'Income mobility'. In A.B. Atkinson and F. Bourguignon (eds), *Handbook of Income Distribution*, 2: 807–935. Amsterdam: Elsevier.

Kanbur, R. (2018). 'Parents, Children and Luck: Equality of Opportunity and Equality of Outcome'. In Martin Guzman (ed.), *Toward a Just Society: Joseph Stiglitz and Twenty-First Century Economics.* New York: Columbia University Press.

Kanbur, R., and J.E. Stiglitz (2016). 'Dynastic Inequality, Mobility and Equality of Opportunity'. *Journal of Economic Inequality*, 14: 419-34.

Kanbur, R., and A. Wagstaff (2016). 'How Useful Is Inequality of Opportunity as a Policy Construct?'. In K. Basu and J.E. Stiglitz (eds) *Inequality and Growth: Patterns and Policy* (Vol. I) *Concepts and Analysis*. Basingstoke: Palgrave Macmillan.

Krueger, A. (2015). 'The great utility of the Great Gatsby Curve'. Brookings Institution, https://www.brookings.edu/blog/social-mobility-memos/2015/05/19/the-great-utility-of-the-great-gatsby-curve/. Accessed 15 July 2019.

Mazumder, B. (2005). 'Fortunate sons: new estimates of intergenerational mobility in the United States using social security earnings data'. *Review of Economics and Statistics*, 87(2): 235–55.

Mirrlees, J.A. (1971). 'An exploration in the theory of optimum income taxation'. *Review of Economic Studies*, 38(114): 175–208.

Mirrlees, J.A., S. Adam, T. Besley, R. Blundell, S. Bond, R. Chote, M. Gammie, P. Johnson, G. Myles, and J. Poterba (2011). *Tax by Design*. Oxford: Oxford University Press.

Payne, G. (2017). *The New Social Mobility*. Bristol: Policy Press.

Peltzman, S. (1973). 'The effect of government subsidies-in-kind on private expenditures: The case of higher education'. *Journal of Political Economy,* 81(1): 1–27.

Roemer, J.E. (1998). *Equality of Opportunity*. Cambridge MA: Harvard University Press.

Shorrocks, A.F. (1978a). 'The Measurement of Mobility'. *Econometrica*, 46(5): 1013-24.

Shorrocks, A.F. (1978b). 'Income Inequality and Income Mobility'. *Journal of Economic Theory,* 19(2): 376-93.

Solon, G.(2004). 'A model of intergenerational mobility variation over time and place'. In M. Corak (ed.), *Generational Income Mobility in North America and Europe*. Cambridge: Cambridge University Press.

Stokey, N. (1998). 'Shirtsleeves to shirtsleeves: the economics of social mobility'. In N.L. Schwartz, D. Jacobs, and E. Kalai (eds) *Frontiers of Research in Economic Theory: the Nancy L. Schwartz Memorial Lectures 1983–1997*. Econometric Society Monographs. Cambridge: Cambridge University Press.

Wagstaff, A., and R. Kanbur (2015). 'Inequality of Opportunity: The New Motherhood and Apple Pie?'. *Health Economics*, 24: 1243–47.