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INTERGENERATIONALITIES: SOME EDUCATIONAL QUESTIONS ON QUALITY, QUANTITY AND OPPORTUNITY

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Intergenerationalities:
Some Educational Questions on Quality, Quantity and Opportunity

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Contents

Abstract

This paper raises a number of issues in thinking about and addressing the intergenerational transmission of disadvantage. Starting with choice subject to constraints by parents as determining outcomes for children, the paper identifies sequences of interventions to relieve "binding constraints" in the expansion of education. But the fact that parents choose for children is shown to raise a number of questions on normative aspects of inequality measurement. The main conclusions are as follows: (i) A key analytical task is to identify whether education is supply constrained or demand constrained; (ii) The cost-benefit analysis of identifying the "most binding constraint" requires the estimation of an education quality production function; (iii) The recent focus on "quality as opposed to quantity" in education is not self-evidently pro-poor; (iv) The intergenerational links inherent in education between parental choice and children's outcomes, raise serious conceptual and empirical questions on attempts to separate out inequality of opportunity from inequality of outcomes.

1. Introduction

At a fundamental level, since children do not choose who they are born to, it goes against basic moral intuitions that their wellbeing as adults should be predetermined by the earlier generation's circumstances. Moreover, if the distribution of innate talent is weakly correlated with parental circumstances, a close correlation of outcomes between generations may also signal an inefficient allocation of talent. Not surprisingly, the intergenerational transmission of (dis)advantage is increasingly important in the development discourse with links to issues such as mobility and inequality of opportunity. For example, the next UNDP Regional Human development Report for Latin America is devoted entirely to his topic.

This paper raises a number of issues in thinking about and addressing the intergenerational transmission of disadvantage. Starting with choice subject to constraints by parents as determining outcomes for children, the paper identifies sequences of interventions to relieve "binding constraints." This is taken up in Section 2. But the fact that parents choose for children is shown to raise a number of questions on normative aspects of inequality measurement, especially the measurement on inequality of opportunity. These issues are developed in Section 4. Section 5 pulls together the conclusions of the paper.

2. Quantity, Quality and Binding Constraints

2.1 Choice and Constraints

As noted above, this paper will use the language of education and schooling choices to make its basic points—it should be clear that the framework is applicable more generally to other aspects of intergenerational transmission. Let us start then with a household of adults and children, and let us take a number of things as given for this household—the gender of the children, its assets, the prices it faces and the structure government services including education. We will move to consider the choices on education that this household might make, but let us note that even the above "givens" may themselves be the result of prior choice—who to marry, how many children to have, etc. All of these, and more, are of course discussed in the vast literature on the economics of education.

In order to develop a sharp perspective on choice and constraints in education, we will start with a stripped down set up where households face the decision of whether or not to send each child to public schooling which provides an education of given quality at zero direct cost. Basic economics then tells us that the decision on whether to send the child to school will depend among other things on (i) the opportunity cost of schooling, essentially output and services foregone in using the child's labor in household activities or in employment, (ii) the economic return from schooling of given quality, (iii) the quality of schooling and (iv) non-economic preferences on schooling of children.

Furthermore, whether to send a child to school or not is an intertemporal choice problem for the parents. The economic choice trades off immediate costs in terms of the private and opportunity costs, against future returns from the child's education. The intertemporality in turn introduces new considerations—whether and at what terms the household can borrow to finance the immediate costs, and its preferences regarding present versus future consumption. Thus in addition we would expect demand for schooling to be higher if (v) access to and term of credit are better (vi) the pure rate of time preference is lower.

How could other household level parameters affect the outcome? Obviously, higher benefits net of opportunity costs, and the appropriate tilt in non-economic preferences for education, will induce greater demand for education. The effect of higher assets is, on the face of it, ambiguous since opportunity costs might be higher (think of a larger farm holding needing labor), but perceived returns might also be higher and credit access might be easier (or not necessary). In practice, the evidence is that household with higher assets are more likely to send their children to school. The effect of household preferences is clearer—the lower the rate of pure time preference, and the higher the level of "pure school preference," the greater will be the schooling.

The above is of course a simplified account of the "demand" for education, on which there is a vast literature.[1]

Why would the government wish to intervene in education? For this, let us start with a situation where there is not government education, only private education. The standard economic argument would be that in such a situation if social returns exceed private returns, with the result that without government intervention there would be lower than the socially optimal level of aggregate schooling. So there is a case for government intervention. Further the outcome might be more inequitable, with the better off being better able to afford more schooling and getting the higher returns from it. This is another reason for an egalitarian government to intervene. While the case we have looked at in the previous paragraphs, and the one we continue with below, is one without private education, the basic elements of the argument carry over. The rationale for government intervention to spread education is that without such intervention the outcome would be less efficient and less equitable.

Suppose the government has a fixed quantum of resources to spend on education, with the objective of increasing the number of children in education. How should the use of resources be prioritized? This relates to the binding constraints perspective on policy making advanced by Hausmann, Rodrik and Velasco (2005). Actually, as they clarify what they mean is "most binding constraints", which in turn is a way of posing the question: where should the government intervene fist, given that any number of interventions could improve social welfare—where will the returns be highest?

2.2 Supply Constrained versus Demand Constrained

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[1] For only the most recent of a series of surveys, see Orazem and King (2008).

Let us start with the case where households are identical, so there are no distributional issues; the only issue is that privately chosen levels of education might be socially sub-optimal. If the number of school places at fixed quality exceeds the demand for these places, then the educational outcome is "demand constrained". As the demand increases, either because household parameters or extra-household parameters change, the time will come when the number of children equals and the number of places and then, beyond this point, the demand for education exceeds the supply and education becomes supply constrained. Increasing the quantity of education of given quality requires expansion of the number of school places. Looked at another way, let us hold demand for education constant and start with zero school places. Clearly, education is initially supply constrained, and will increase with the number of school places. But as the number of places increases it will eventually exceed demand and education will become demand constrained.

Thus one conclusion is straightforward and obvious, but powerful. The first level of prioritization depends on whether we are in a demand constrained or a supply constrained regime.[2] If the former, there is no point in spending resources on increasing the number of school places; if the latter, the first priority is obviously to increase school places. The first analytical priority, then, is to discover whether we are in a supply constrained or in a demand constrained regime.

Within the demand constrained regime, on the other hand, resources should obviously be spent where they increase demand the greatest—on the constraint which is "most binding."[3] Thus within the demand constrained regime, we need to identify which of (i)-(vi) are amenable to change through government intervention and which will in turn have the biggest impact on the demand for school places. Of these, it might be argued that (i) and (ii) are economy wide parameters, not necessarily amenable to sector specific intervention; while (vi) is difficult to alter in the short run. However, the net effect of (i), (ii) and (v) can be changed by specific subsidies to education. Beyond this we are left with trying to alter (iii) or (iv) through specific interventions—changing quality by improving teacher/pupil ratios for example, or effectively, educating parents about the benefits of education (of girls, for example). Thus in this stylized representation there are three ways of increasing the total demand for education: providing a financial subsidy to sending children to school; increasing the quality of education; or changing non-economic preferences in favor of education.

How are we to know whether we are in a supply constrained regime or a demand constrained regime, assuming fixed quality? There two potential tests. First, if an expansion in the number of places leads to increasing enrollment, then demand had previously been rationed and school places were the binding constraint. Second, if a schooling subsidy increases enrollment, then school places were not the constraint—parental demand was. It is not easy to test for the former with time series data because increases in places and increased enrollment move together with overall national trends, making it difficult to establish causality. However, governments have sometimes made dramatic reduction in

[2] See Devarajan and Kanbur (2007)
[3] Hausmann, Rodrik, Velasco (2005)

4

school fees, allowing us to explore the links between these reductions and enrollments.[4] In general, there is a significant connection between lower school fees and school enrollment, a finding that confirms cross-section regression analysis showing a negative relationship between school costs and school attendance.[5] One of the most striking examples of the impact of school costs on school attendance comes from the evaluation of the Progresa program in Mexico which did not lower fees but instead made cash payments to the family conditional on the child remaining in school. Rigorous evaluations of this program have confirmed that it had a positive impact on school attendance.[6]

2.3 Quantity versus Quality

If we are in a demand constrained regime, the focus should be on the "most binding" constraint, meaning by this where government resources would yield the highest social return by increasing the demand for education. There are of course many factors as discussed above. But, we can sharpen the discourse by posing the following question: at the margin, should the priority be increasing quality or compensating for costs of schooling (or building schools closer to underserved populations)?[7]

In recent years it would seem that the focus of analysts and policy makers has shifted from expansion of enrollment to improving quality of education. This is partly because there has indeed been rapid expansion of enrollment, and at the same time quality problems, especially teacher quality problems as manifested in absenteeism, for example, have become clearer. Test scores do not seem to have kept pace with enrollment expansion. Focus on quality delivers a double benefit—for all those enrolled, a higher quality education is beneficial socially; but ceteris paribus higher quality also increases demand for education, as read off from the demand for education function. A clear policy conclusion seems to be—at the margin, the government should spend its resources on improving quality, through better monitoring and disciplining of teachers for example, rather than expanding quantity, through lowering fees and through subsidies.

The answer to the question posed depends on the following cost-benefit logic.[8] We think of an estimated demand for education function, with education costs and education quality (measured for example by the teacher pupil ratio[9]). The coefficients on these two variables are of course central to the argument, but they are insufficient by themselves. What is further needed is how a given quantum of government funding translates into cost

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[4] http://www.worldbank.org/oed/education/uganda.html, http://jae.oxfordjournals.org/cgi/content/full/ejn015,
[5] Deininger (2003) for an assessment of the Uganda case, one of many.
[6] Levy (2006) provides a summary.
[7] Note that unlike this paper, much of the literature calls improvement in quality a "supply side" measure. This is true in a descriptive sense, school places and their quality supply education. However, in the framework of this paper quality comes into its own when education is demand constrained—the places exist but households need to be induced to send their children to school,
[8] A comprehensive attempt at a cost benefit approach is by Orazem, Glewwe and Patrinos (2007). Interestingly, they classify improving quality as a "supply side" measure.
[9] Even this may be too much at the input end of the spectrum. It might be argued that test scores for children are a more outcome based measure of quality but, as a large literature shows, these are in turn confounded by other factors such as pupil ability and teacher quality.

5

reduction, or into increase in quality. The cost reduction is relatively straightforward since it is in the same units as fiscal resources. But translation of fiscal resources into quality requires a production function, even if quality is measured straightforwardly in input terms such as the teacher-pupil ratio. Discovering whether the "most binding constraint" in education, therefore, requires us not simply to estimate a demand for education but to also, in effect, to estimate a production function for education quality.[10]

There is, however, a caveat to the above formulation with fixed quality, in which we are either in a supply constrained or a demand constrained regime. Consider the following stylized set up. The government spends a fixed amount on schools, thought of as the number of teachers. There are no school places as such, simply the pupil-teacher ratio. Further, let the quality of education be the teacher-pupil ratio. It is then easy to see how, for given government expenditure, the equilibrating variable is education quality. Starting from a relatively high value of the teacher-pupil ratio, quality is high so demand is high. But as the number of pupils rises the teacher-pupil ratio falls and with it the quality of education and the demand for education. The equilibrium, then, is at an enrollment level which generates a teacher-pupil ratio which elicits that enrollment the demand for education equation. Quantity and quality are thus the jointly determined as equilibrium outcomes given the demand function for education, the production function for educational quality, and government resources devoted to education. With this setting, therefore, simply running regressions of measures of schooling on measures of school quality will lead to inappropriate estimates of the effects of quality on the demand for education—because quality is itself endogenously determined by the demand for educational places and hence pressure on school facilities.[11]

2.4 Quality, Quantity and Poverty

All of the above is for identical households. I now want to argue that the quantity-quality discourse takes on important and interesting dimensions when we consider education of children from rich and poor households. Of course if enrollment throughout is literally100%, or close to it, then the only issue is quality and that is that. But if enrollment remains an issue, and Progresa/Oportunidades seems to suggest that special efforts are needed to keep it up, then the tradeoff is ever-present. The issue I now want to raise is that

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[10] In an interesting paper Handa and Simler (2000) attempt a direct cost-benefit analysis of improving teacher-pupil ratios versus building schools in underserved areas. They conclude as follows: Results from these simulations show that improving school quality (by reducing the PTR) increases grade attainment and efficiency by approximately 9 percent with no impact on overall enrollment rates. However, these same results for average school achievement can be generated by increasing starting enrollment probabilities through the establishment of new schools (increasing school quantity) in all rural villages that currently do not have schools. Furthermore, similar rates of increase in school achievement indicators can be achieved by building schools in only 56 percent of all villages currently without schools, provided these schools are placed in those villages that also do not have a school in a nearby village….When one considers the relative cost of the quantity and quality interventions proposed, the results for school achievement are the same."

[11] This point is over and above the now standard caveats in estimating demand for education, or determinants of test scores, because of selection bias and unobserved heterogeneity. Thus the Handa and Simler (2000) paper addresses program endogeneity etc., but I do not believe it addresses the simultaneity induced by the fact that demand depends on the pupil-teacher ratio, but in turn determines this ratio.

the beneficiaries of enrollment expansion versus quality improvement may be different. The central point is that quantity expansion may favor poorer households, while quality expansion may favor better off ones.

This is most easily seen where education is supply constrained, with children having to walk long distances to schools in poor rural and remote areas. At the margin resources that are used here to increase supply will benefit poorer households, compared to spending these same resources on quality enhancement in areas that are well supplied with school places and hence demand constrained rather than supply constrained. This is an empirical question, of course, but most would accept the stylized fact that the latter are likely to be better off areas, with better off households compared to the remote areas.[12]

But even in demand constrained situations, the quantity-quality tradeoff needs to be thought through carefully. If educational enrollment is a normal good for parents, then the poorest households are the ones who will not as yet have their children enrolled in school. The question then is which intervention will have the greatest impact on the greatest number of the poorest households—improving quality of the school, or providing special demand side inducements on the cost side to encourage sending children to school? This is an empirical question, but it is at least plausible that a poverty focus would not necessarily lead to an emphasis on resource use at the margin for quality enhancement rather than for enrollment enhancement. One reason for this is that while quality improvement will also induce poor households currently not sending their children to school to do so, it will provide an infra marginal benefit to the not-so-poor households who are already sending their children to school. But a Progresa-type subsidy for increasing (or maintaining) enrollment can be targeted at the households who are at the margin of sending or not sending their children to school (i.e. poorer households), and can thus be a better targeted use of resources from the perspective of poverty reduction.

Where the government cannot target, but can either improve quality for all in schools or provide subsidy for all for attending school, the conclusion is ambiguous from the point of view of impact on poverty households. The central empirical issue is then whether quality enhancement or financial subsidy is the most cost effective method of in tipping poor households at the margin of sending their children to school. The implication for analysts, then, is that we need more fine grained demand for education functions, estimated for different wealth classes, to see if there are differential impacts across these classes.

3. Parental Choice and Equality of Opportunity versus Inequality of Outcomes

In the concluding part of the last section I took up the distributional dimension of education explicitly, and looked at the quality-quantity tradeoff where we are concerned about welfare outcomes for the worst off households. Educational interventions, and social sector interventions more generally, are more often than not justified not just on efficiency

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[12] Handa and Simler (2000) focus on building schools where none exist, but do not fully draw out the poverty targeting implications of the quality improvement versus quantity expansion tradeoffs.

but also on equity grounds. Educational intervention is emphasized, in particular, as being preferable to direct redistribution of income or wealth as an instrument for advancing equity because, it is argued, education is about "equality of opportunity" and thus is superior because equalizing "opportunity" is superior to equalizing "outcomes". The equality of opportunity perspective, developed by Roemer (1998), has been given prominence in recent years because of its adoption by the World Bank in its World Development Report (2006), and subsequent analytical application in many countries, especially in Latin America.[13]

I want to argue that the focus on equality of opportunity, and the attempts to distinguish it from equality of outcomes, are problematic conceptually and empirically, and especially so for the case of education, where parents make choices that determine outcomes for their children.

3.1 Circumstance versus Effort

The central categorization in Roemer (1998), in attempting to distinguish equality of opportunity from equality of outcome, is the distinction between an individual's "circumstance" versus that individual's "effort". Circumstance is a collection of factors over which an individual has or has had no control. Effort is meant to encompass those factors over which the individual can exercise or has exercised some control. The normative value judgment is that differences in outcomes attributable to circumstance are morally relevant; those attributable to effort are not. Race and gender are obvious examples of circumstance. Inherited ability is another, as is inherited wealth. A "taste" for hard work, and therefore higher income earned as a the result of working more, or for postponing consumption, and thus higher income out of the return from saving later on, is put into the "effort" category. Thus if the distribution of outcomes was the same no matter what the circumstance, the differences could be attributed to effort and only effort. Roemer (1998), and the World Bank (2005) would then call this "equality of opportunity," since variations in outcome would be due to variations in effort or to random shocks for which individuals were ex ante equal.

The impact of "effort" or "taste" on outcomes, and its implications for the normative significance of the inequality of outcomes, was an important part of Milton Friedman's argument in his *Capitalism and Freedom*:

"Another kind of inequality arising through the operation of the market is also required, in a somewhat more subtle sense, to produce equality of treatment, or, to put it differently, to satisfy men's tastes. It can be illustrated most simply by a lottery. Consider a group of individuals who initially have equal endowments and who agree voluntarily to enter a lottery with very unequal prizes. The resultant inequality of income is surely required to permit the individuals in question to make the most of their initial equality…Much of the inequality of income produced by payment in accordance with the product reflects 'equalizing' difference or the satisfaction of men's tastes for

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[13] See for example, Bourguignon, Ferreira and Walton (2007) and Ferreira and Gignoux (2008). See also Roemer (2006).

uncertainty…Redistribution of income after the event is equivalent to denying them the opportunity to enter the lottery."

In many ways, Roemer's (1998) development can be seen as tempering this perspective by arguing that outcomes are also influenced by circumstance—individuals do not have equal endowments to begin with, and everybody does not face the same "lottery." But the fact remains that Roemer (1998) and World Bank (2005) accept the basic Friedman contention that only part of the observed inequality of income (say) is a legitimate target for redistribution. Once the distinction between circumstance and effort is accepted, this conclusion must follow.

The distinction is thus crucial, conceptually and certainly empirically if one attempts to estimate the "inequality of opportunity" as distinct from the "inequality of outcome." But there are a number of issues with this attempted separation of circumstance from effort. To the extent that preferences are non-separable in wealth, surely inherited wealth affects work-leisure and saving-consumption preferences? But perhaps we can isolate that part of variation in tastes caused by variations in wealth and treat that as "circumstance". Suppose now that wealth did not affect tastes in this sense—there is separability, for example, between wealth and the pure rat of time preference. Or wealth and labor-leisure preferences. To what extent are individuals responsible for the tastes they are born with? Why is inherited ability, or inherited skin color, part of circumstance, but inherited taste for leisure versus work is not? Clearly, moral values are being imported into the discourse from somewhere other than the framework itself to make these distinctions, which cannot be so easily or consistently made within the framework itself.

But what I want to focus on here is that the separation is particularly difficult where generations are linked through choice—through wealth inheritance, and through education.

3.2 Parents' Choice, Children's Circumstance

The problems arise because parental choice leads directly to children's circumstance. One strand of problems, seemingly esoteric but conceptually compelling, is that if children's circumstance when they grow up determines parents' wellbeing when they (the parents) are older, then children's tastes (as anticipated by parents, and as actually so in full rational expectations equilibrium) are already complicit in their inheritance and thus in their circumstance. Lest this be thought an intellectual curiosum, it should be pointed out that there is now a large theoretical and empirical literature on such strategic elements in intergenerational transfers. If any portion of these linkages are to be believed, then the independence of wealth inheritance from children's tastes can be questioned, and with it the distinction between equality of opportunity versus equality of outcomes.

Although the literature on strategic models of intergenerational transfers is primarily focused on wealth transfers, there is no reason why it should not apply to parents transferring human capital, in the form of education, in anticipation of being looked after by their children in due course. Once this is accepted, strategic factors apply to education as

well. Hence the separation between the child's (anticipated) tastes and its circumstance is questioned, and with it the separation between opportunity and outcome.

But let us leave this literature to one side and stick to the simple formulation where parents choose the education for the child and this education becomes the child's circumstance. Consider a case where all parents are identical in every respect except for their tastes for present versus future consumption—their pure rate of time preference. Then according to the Roemer (1998) and World Bank (2005) definition there is equality of opportunity and there is no need for any intervention in education on distributional grounds (there may be efficiency based reasons, but that is another matter). The result will be that there will be inequality of outcome in education. The children of parents with higher degree of pure time preference will have lower levels of education given that education involves a sacrifice of present consumption for parents in return for future gains. Their children will have lower education, and hence lower income and lower consumption.

The difficulties should now be clear. An attempt to equalize the education distribution of children will violate equality of opportunity of parents, and privilege equality of outcome. An attempt to equalize the distribution of income among the second generation, for example, having transfers to support the poorest (who are poor because of the choices freely made by parents equal in their circumstance but unequal in their efforts) is, in Friedman's words for his particular context "equivalent to denying them the opportunity" to exercise their tastes ("to enter the lottery").

If the different lines of critique developed above are accepted, what is left of the distinction between equality of opportunity and equality of outcome? It seems to me that the only thing that could survive conceptually is in fact the situation described by Friedman—inequality caused by identical lotteries undertaken by individuals in full knowledge of the consequences is the only variation in outcomes that is not tainted by a conflation of "circumstance" and "effort." Thus empirical work that isolates variation in income due to race, gender, and a number of other variables, designates this as "inequality of opportunity" and thus illegitimate, and what is left thus as "legitimate" by implication, is indeed overstating the degree of "legitimate" inequality.

But, finally, I have argued elsewhere that even in the "pure" Friedman case of identical individuals freely engaging in identical lotteries, it is not clear that our moral intuition would be willing to countenance a disastrous outcome for someone if that was decreed by the lottery outcome.[14] Even if "they were all equal and they all knew what they were doing," I contend that our moral instincts are to redistribute after the vent to support those who are made indigent after the event. In fact, I believe that it is the same instinct that leads Bourguigon, Ferreira and Walton (2007) to "tack on" a "nobody below a poverty line" to their "equality of opportunity" objective function.

Thus, although educational interventions are justified as being particularly justified because they address "inequality of opportunity" rather than "inequality of outcome", it is precisely the case of education, because of the "intergenerationalities" inherent in it, that

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[14] See Kanbur (1987).

plays a major part in undermining the strict dichotomy between "circumstance" and "effort" and hence between "equality of opportunity" and "equality of outcome." We are conceptually stronger ground simply by taking educational interventions as one among many to improve the distribution of wellbeing in the population.

4. Conclusion

Here are the conclusions of this paper:

1. A key analytical task is to identify whether expansion of education in a particular area is supply constrained or demand constrained.
2. Within demand constrained regimes, the cost-benefit approach to identifying the "most binding" constraint requires the estimation, in particular, of an educational quality production function.
3. The recent focus on quality is not self-evidently pro-poor; there is a danger that with this focus, resources may flow to improve the quality of education of the already enrolled children of wealthier households, rather than expand access to poorer households, who are more likely to be at the margin of enrolling (or keeping) their children at school.
4. The intergenerational linkages inherent in education highlight basic conceptual and empirical problems in isolating inequality of opportunity separately from inequality of outcomes (in education or income).

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