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A stocktaking and an agenda for the way forward

MARTIN GUSTAFSSON AND THABO MABOGOANE

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MARTIN GUSTAFSSON
SOCIAL POLICY RESEARCH GROUP
DEPARTMENT OF ECONOMICS
UNIVERSITY OF STELLENBOSCH
PRIVATE BAG X1, 7602
MATIELAND, SOUTH AFRICA
E-MAIL: MGUSTAFSSON@SUN.AC.ZA

THABO MABOGOANE
JET EDUCATION SERVICES
JOHANNESBURG
SOUTH AFRICA
E-MAIL: TMABOGOANE@JET.ORG.ZA

UNIVERSITEIT
STELLENBOSCH
UNIVERSITY

BER
BUREAU FOR ECONOMIC RESEARCH

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South Africa's economics of education:
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MARTIN GUSTAFSSON[1] AND THABO MABOGOANE[2]

ABSTRACT

The paper reviews some of the existing economics of education literature from the perspective of South Africa's education policymaking needs. It also puts forward a suggested research agenda for future work. The review is arranged according to five key areas of analysis: rates of return, production functions, teacher incentives, benefit incidence, cross-country comparisons. Whilst benefit incidence analysis is able to demonstrate large improvements in the equity of public financing, cross-county comparisons reveal that not only is quality inequitably distributed, it is overall well below what the country's level of development would predict. Production functions, especially if translated to cost effectiveness models, can point to important policy solutions. Rates of return are difficult for policymakers to interpret, and need to be viewed in the context of qualifications. Teacher incentives is a policy area that is badly in need of a better theoretical and empirical basis.

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[1] Economist based in the Social Policy Research Group at the Department of Economics, Stellenbosch University, South Africa. E-mail address is mgustafsson@sun.ac.za.

[2] Economist based at JET Education Services, Johannesburg, South Africa. E-mail address is tmabogoane@jet.org.za.

1. INTRODUCTION

Psacharopoulos (1996a: 343), arguably one of the founders of the current economics of education tradition, points out: 'In the field of education, perhaps more than in any other sector of the economy, politics are substituted for analysis.' This problem in the education sector is conceivably brought about by three factors: There may be an absence of relevant analysis, the analysts may not be successful in communicating their findings to the policymakers, or the policymakers may resist paying attention to the analysts. This paper examines the first two factors. It focuses on the South African context, but much of the paper would be relevant to other countries, especially in the developing world, given the universal nature of many of the economic and policy issues.

The paper takes stock of the economics of education literature that is influencing, or should influence, South Africa's education policymaking through reference to a few key texts, though by no means all the available literature. Gaps in the literature are identified on the basis of assumptions of what policymakers need. The bias is towards a utilitarian view of the literature: it should inform policymaking and development in rather explicit ways. The intention is not to undermine the value of more academic pursuits in the economics of education field. This is undoubtedly important, but it is not the subject of this paper. The discussion of the literature is organised in terms of five key models or areas of analysis: rates of return, production functions, teacher incentives, benefit-incidence analysis, cross-country comparisons. The paper ends with a tentative research agenda for economics of education in South Africa.

2. RATES OF RETURN

The unconditional relationship between earnings and years of schooling in South Africa points to an average increase in earnings of around 22% for every additional year of schooling possessed in the range of two to eleven years of schools, and a large increase of around 125% associated with the difference between eleven and twelve years of schooling, in other words with having attained Grade 12 (own analysis of the 2005 Income and Expenditure Survey data of Statistics South Africa focussing on anyone who reported earning an income). This kind of unconditional analysis suffers from two key weaknesses. Firstly, the net benefits are not clear as the cost, both private and social, of possessing more years of schooling are not taken into account. Secondly, other factors such as years of experience, gender and (in particular in the case of South Africa) race, which may play a separate role in determining income, are ignored. Two distinct methods are commonly employed to overcome these two weaknesses, though it is rare to find both weaknesses addressed within the same analysis. Herein lies some of the confusion that surrounds rates of return to education. A further problem is the fact that the policy implications of rates of return analyses are often not explored, or they are explored in a manner that is too rudimentary to be helpful to policymakers.

The first of the two methods, which has been called the 'elaborate method' (Psacharopoulos, 1981: 322 and Woodhall, 2004: 73), employs the same basic internal rate of return calculation that would be used to calculate the return on a non-education investment. This method considers both income benefits associated with more education, and the private and public costs of education. Psacharopoulos and Patrinos (2002) argue that a cross-country comparison of annual rates of return, where

these rates are based on the elaborate method, reveals very clearly two patterns. Firstly, primary schooling yields better returns than secondary schooling, which in turn yields better returns than tertiary education. Secondly, rates of return are higher the less developed a country is. A third observation would be that annual rates of return to education have tended to be considerably higher than world real interest rates (well over 10% against never over 6%), suggesting that education is a particularly good investment for society (Desroches and Francis, 2007: 2).

Education rates of return for South Africa published by Psacharopoulos and Patrinos (2002: 19) using the elaborate method are too old and unrepresentative to be useful for South African education policymakers. They are based on 1980 data for African residents of Durban (Psacharopoulos, 1993: 41). It would seem as if no subsequent rates of return estimates using the elaborate method have been published for South Africa.

The second method, generally referred to as the Mincerian approach, makes use of an earnings function to examine the relative effects of years of schooling and years of experience on earnings, and on a theoretical level views experience as informal schooling that occurs after one's formal schooling has ended (Mincer, 1974: 130). It considers the cost of formal schooling only in terms of the opportunity cost of income forfeited, not in terms of the direct private and public costs of schooling.

Strictly speaking, only the elaborate method yields proper rates of return values, though Mincerian beta coefficients for years of schooling are commonly also described as rates of return – Psacharopoulos and Patrinos (2002: 3) prefer the term 'wage effects' for the latter. The argument that the Mincerian approach produces rate of return-like statistics is sound (Woodhall, 2004: 73), but it is important to explain to

policymakers that the Mincerian approach produces values that are often much lower than those using the elaborate approach. How much lower depends largely on whether the elaborate approach includes the public (and even private) costs of education (Psacharopoulos and Patrinos, 2002: 12-4).

There have been numerous rates of return analyses using the Mincerian approach with South African data. Keswell and Poswell (2004) present their own data analysis, plus a meta-analysis of previously published South African texts. (Though Keswell and Poswell (2004: 841) refer to some of their models as 'non-Mincerian', they are essentially non-linear versions of the Mincerian approach). The Mincerian approach typically involves adding additional biographic variables not included in Mincer's (1974) original model. Keswell and Poswell (2004) include race, gender and rurality in their analysis. Their key finding is that the returns to schooling increase with years of schooling, and that at the pre-Grade 12 level in South Africa each additional year of schooling yields almost no income returns. This is in stark contrast to the Psacharopoulos and Patrinos (2002) finding that returns are highest at the primary level. It is important to view this not as a fundamental dispute amongst the economists over the effects of education, but rather as a natural outcome of using different methods and different meanings attached to the term 'rate of return'. Crucially, the Mincerian approach does not take into account the direct costs of education, which include (at least in South Africa) a high private cost of tertiary education.

From an education planning perspective, it is useful to view the typical Mincerian analysis in the light of labour market signals produced by education qualifications. The very sharp increase in the returns to schooling at the point where twelve years of schooling are completed, as seen in an unconditional analysis referred to above, or in

Keswell and Poswell's (2004) sharp 'take-off' in the rate of return at or one year after Grade 12, must to a large degree be associated with the possession of a Grade 12 certificate. This certificate, which is the only standardised qualification issued within the South African schooling system, may put pressure on the system to improve the skills and knowledge of pupils to an exceptional degree in the one or two grades preceding Grade 12, but at least part of the income advantage with having successfully completed Grade 12 (as opposed to Grade 11) must flow from one's possession of a crucial and widely recognised means for signalling to employers the value and nature of one's human capital. Assuming that qualifications do influence earnings in a manner independently of actual education, an obvious question for the policymaker is how changing the system of qualifications, for instance through the introduction of a Grade 9 certificate (something that has been on the South African policy agenda for a while), might influence the profile of returns to years of schooling. How crucial a policy question this is is illustrated in the next graph, which indicates that the recent trend has been for around 60 per cent of young South African adults to have no qualification at all, and that there is no evidence (at least not in the graph) of a downward trend in this statistic.

Figure 1: Highest qualification held by age (2007)
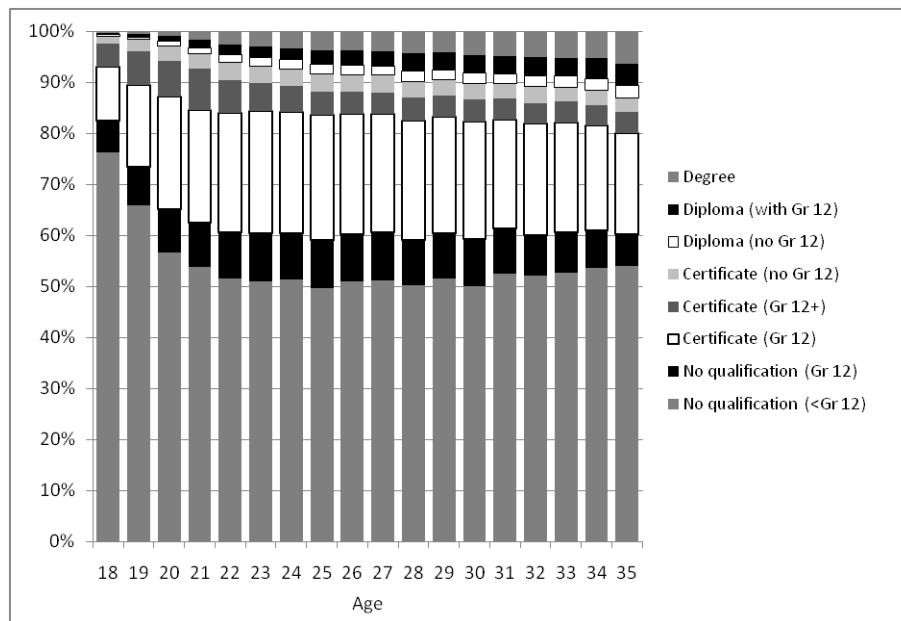
Source: Statistics South Africa, 2007 Community Survey dataset. Note: 'Certificate (Gr 12+)'
refers to Grade 12 Senior Certificate with a university entrance level. 'No qualification (Gr
12)' refers to someone who attended but did not pass Grade 12, meaning he would have no
national school qualification. 'No qualification (<Gr 12)' refers to someone who did not
attend Grade 12. An examination of the NIDS Wave 1 dataset
(http://www.nids.uct.ac.za/index.html) reveals the same percentage of unqualified adults as
the Community Survey dataset used here.

There is a challenge, not just in South Africa, to make the policy implications of
patterns seen in rates of return analyses clearer. One part of this challenge is to
examine how the structure of the country's qualifications systems impacts on
decisions and earnings in the labour market. This is not a well researched area, though
analysis from the United Kingdom points to ways of modelling the independent
impact of education qualifications in a rates of return analysis (Dearden, 1999).

In South Africa, the large earnings effects associated with race in the Mincerian
earnings function, in particular the earnings advantage of whites, begs the following

policy question: To what extent is this effect attributable to inequalities in the skills and knowledge of similarly qualified people (bearing in mind the strong legacy of apartheid inequality in educational quality), and to what extent is it attributable to unfair discrimination in the labour market? Burger (2009: 22) finds that of earnings inequality remaining after years of schooling have been taken into account, around two-thirds is attributable to educational inequality problems and one-third to residual factors of which labour market discrimination would be one.

Finally, rates of return analyses can also be used to compare income returns to different types of education at the same level. Psacharopoulos (1993: 48) provides a comparison of the rates of return for academic and vocational secondary schooling, and finds that when the higher costs of vocational schooling are taken into account, the returns to academic schooling are higher. At least anecdotally, this finding lies behind the rather lukewarm response of policymakers to vocational schooling. What might the situation be in South Africa, where recent years have seen substantial growth in the budgets and enrolments of pre-tertiary vocational schooling (the 'FET colleges'), and the introduction of a new vocational curriculum? No published rates of return analysis seem to exist, though unpublished and exploratory analysis performed by one of the authors of this paper suggests that when controlling for race and gender, and taking into account private and public costs, historically vocational training has yielded better rates of return than ordinary schooling. This suggests that South Africa, like many other countries (Bennell, 1996), does not conform to the global pattern described by Psacharopoulos (1993).

3. PRODUCTION FUNCTIONS

Whilst rates of return analyses are central to attempts to explain the external efficiency of education systems, production functions assume the same role with respect to the internal efficiency of education institutions. Productions functions essentially aim to identify which education inputs, such as teacher qualifications, availability of teaching materials, teaching time and so on, have the largest effect on outcomes in the form of the test scores of pupils. There has been keen interest amongst economists to explore this model, though for a number of reasons discussed below, the reception amongst policymakers has been mixed.

Perhaps the most important reason to be sceptical about the use of a *single* production function study to inform policy is that the data used for the analysis were in most cases not compiled for the purpose of this kind analysis. For this reason, Hanushek (2002: 12), a prolific analyst in this area, laments the fact that most production function analysis is 'opportunistic'. In particular, the ideal of test scores from two points in time, allowing for a value-added approach, and data at the level of pupils (including socio-economic data) and not just the school, is often not realised. Despite these problems, identifying what inputs emerge as important across several production function studies through meta-analyses, such as that produced by Hanushek (2002) for the United States, has come to be regarded as a valuable process that can indeed inform policy. Of course this solution pre-supposes the existence of a critical mass of studies from the country concerned.

Two growing realisations in the education sector justify having more and better production function studies. One is the realisation that learning outcomes are a far more serious and elusive problem than is often assumed. The evidence from South

Africa, but also from elsewhere, indicates that relatively high public spending and even well qualified teachers can easily co-exist with very poor education outcomes (Van der Berg, 2007). The second is the realisation that inputs that intuitively make sense as a means to improve outcomes are often not effective in reality – the case of reducing class sizes is discussed below.

In South Africa a few studies have used pupil-level data to examine the production of learning results in primary schools: Van der Berg (2008) and Gustafsson (2007) using the 2000 Grade 6 SACMEQ (Southern and Eastern Africa Consortium for Monitoring Educational Quality) dataset, and Taylor and Yu (2008) using the 2006 Grade 5 PIRLS (Progress in International Reading Literacy Study) dataset. Studies focussing on secondary schooling have had to rely on school-level data: Crouch and Mabogoane (1998b), Van der Berg and Burger (2003), and Bhorat and Oosthuizen (2006). The South African findings regarding school inputs have been fairly intuitive ones. For instance, teacher housing in rural areas, libraries, and better teacher knowledge all advance pupil performance. The South African work has also confirmed what studies from elsewhere have found, namely that socio-economic status (SES), in particular the level of education of the pupil's parents, plays a very large role, in fact a much larger role than is commonly believed. In most countries, SES has a somewhat greater influence over the performance differences between schools than all school resource factors combined (OECD, 2007: 171).

Arguably the greatest policy influence that production function studies around the world have had relates to one factor that they rather consistently have said does *not* play a role in improving pupil performance, namely class size. This finding, obviously an important one from a budgetary perspective, has been taken rather seriously by

policymakers. The question of class size illustrates the importance of distinguishing statistical significance from policy significance in an analysis. Certain models do in fact find class size to be a statistically significant predictor of pupil performance (see for instance Taylor and Yu, 2008), but even then, when coefficients are translated into financial values, it is nearly always found that reducing class sizes would be amongst the most costly of all the available policy interventions in the model, relative to the desired performance improvement. This translation of a production function into a cost effectiveness model, by bringing in actual unit costs, is seldom done in the academic literature and is arguably one important reason why policymakers find production functions difficult to interpret. Mingat et al (2003: 56) as well as Pritchett and Filmer (1997) explain the methodology required for this translation.

On the matter of class size, there is an important South African caveat. South Africa's class sizes are exceptionally high by developing country standards. To illustrate, 16% of the country's Grade 8 pupils examined in the 2003 run of TIMSS were in classes exceeding 55 pupils (Gustafsson and Patel, 2008: 25). In countries such as Botswana, Malaysia and Egypt the figure is considerably lower. Data from other years and other grades confirm this pattern. One wonders whether the orthodoxy on class size, partly resulting from production function findings, has perhaps created a blind spot in education policymaking, considering how little policy attention has been devoted to excessively large classes. More focussed attention on the effects of extremely high class sizes in the South African production function work may reveal that South Africa's exceptional situation allows one to detect important thresholds beyond which pupil performance is clearly affected by class size.

A very practical application of the production function technique is demonstrated by Crouch and Mabogoane (1998a). In preparing a list of top performing schools, with respect to the Grade 12 examinations, for the Sunday Times newspaper they use both a traditional approach of simply taking the best results, and a more socio-economically sensitive approach where they compare actual results to the expected results emerging from a production function. Given their socio-economic and other disadvantages, one would not expect even the most effective historically disadvantaged schools to match the results of the best historically advantaged schools. When one controls for background factors, one would obviously obtain different measures of school effectiveness. In the list using the first approach, only one historically black public school appeared in a list of the ten best performing schools. In the list using the second approach, nine of ten schools were historically black public schools. The second approach clearly assists the education administration to identify and laud schools that succeed in overcoming difficult contextual and historical factors, and it assists in identifying schools that should be the subject of more qualitative case studies aimed at finding out what makes these schools so successful. (In 2009 the Sunday Times again published a list of top schools, but this time only the traditional approach was used, resulting in only one historically black public school amongst the top ten[3].)

A discussion of production functions can probably not avoid including a reference to multi-level modelling (MLM), or hierarchical linear modelling (HLM). This method, employed for instance by Gustafsson (2007), has become popular, but has arguably made explaining production function findings an even more difficult task than it is when the ordinary least squares (OLS) method is used. Johnes (2004: 647) finds

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[3] Sunday Times of 18 October 2009.

multi-level modelling 'computationally intractable'. It is probably too early to draw any hard conclusions about the analytical costs relative to benefits of this new method, partly because the MLM computer software is still not fully developed.

Much of the challenge with respect to production function analysis lies in working towards data collections from schools that are better suited to this kind of analysis. This is likely to produce datasets that are better for a variety of analysis techniques, not just production functions. Crouch and Mabogoane (1998a) emphasise the need for better variables on school management in order to reduce the residual, or unexplained, part of South African production functions. One variable that is rare yet of great potential importance in a production function is a direct measure of teacher knowledge. Such a variable will become available, for the first time in South Africa, on the release of the 2007 SACMEQ dataset, which includes scores of teachers in subject knowledge tests.

What is striking in South Africa, is that the government's sample-based Systemic Evaluation testing programme, which produces a dataset that is exceptionally well suited for production function analysis focussing on South African policy questions, has barely been used for this purpose due to lack of access to the dataset amongst researchers. This is unlike the situation in Brazil or the United States, where the equivalent SAEB and NAEP datasets are widely available in research institutions. The institutional problems underlying the inaccessibility of data in South Africa should be resolved in the interests of a greater volume and variety of analysis that can inform difficult education policy decisions.

Lastly, a word of warning by Hoenack (1996: 332) on the influence of production function work on education policymaking deserves mention. Underlying this work is

a quest for the right 'recipe' for effective schooling, so that this can be expressed in the right policies and budgets. This whole approach obviously follows a rather top-down paradigm. An alternative paradigm states that the education authorities should simply insist on good learning outcomes, and monitor such outcomes, and let schools themselves find the right recipes. Both arguments hold merits, depending partly on the kinds of schools one is focussing on. Clearly, production functions should not reinforce an overly top-down policy agenda.

4. TEACHER INCENTIVES

Recent developments in the policy on teacher incentives in South Africa have been turbulent. A much publicised wage agreement with unions in 2008 saw the introduction of salary notch increases every second year for outstanding teachers, where the evaluation of teachers would be based on a mix of schools-based and external inputs. This element of the agreement was dropped in 2009 due to insufficient support from unions. It appears as if teacher incentives linking performance to pay, if introduced at all, need to be the outcome of a rigorous and inevitably time-consuming process of consultation and research.

Economic analysis into teacher incentives has occurred in two key areas. The first looks at the core teacher salary as an incentive for joining the teaching profession and staying there. Because teacher pay is to a large degree determined through a political process, and not in an open market, research becomes especially important. In economic terms, the determination of teacher pay in South Africa displays elements of both monopoly (there is in a sense one supplier, the teaching force represented by unions) and monopsony (there is largely just one buyer of teaching services, the state). The political nature of the wage negotiation process makes the risk high that teacher

pay will be substantially higher or lower than it would have been if teacher pay had been more market-driven. In order to determine whether it is too high or too low, economists typically perform a conditional wage comparison between teachers and other professionals in the economy. The analysis is subject to a number of complexities, including how to define the group of professionals against which teachers are compared, how 'teacher' should be defined and how teacher productivity should be dealt with. Teacher productivity is virtually impossible to deal with empirically in the analysis with the household data that are typically used for this kind of work. Yet it is important to at least acknowledge this dynamic. Basically, if the whole package of incentives, both monetary and non-monetary, for teachers is less effective than it is for other professionals, and teachers tend to be less productive than their peers in other professions, then equal pay for teachers would not be justified, at least not from an economic perspective.

There are at least three South African conditional wage comparisons dealing with teachers: Crouch (2001), using data describing the situation up to 1999, Gustafsson and Patel (2008), using data stretching up to 2007, and Armstrong (2009), also using data up to 2007. The findings of the three are similar. Crouch (2001) finds teacher pay to be more or less comparable to that in other professions, and argues that if there is an under-supply of teachers in South Africa, this is due more to an insufficient provisioning of teacher training than to a problem of poor pay dissuading prospective teachers. However, the pay scales are said to be insufficiently generous for older teachers, increasing the possibility that older teachers will leave the profession. Gustafsson and Patel (2008: 18) explain that the administered nature of teacher pay tends to result in a situation where the actual spread of pay over years of experience does not match the official salary scales, because when the official scales change, they

are not implemented retroactively, meaning that the actual pay of teachers will to a large degree be a reflection of previously existing official scales. Like Crouch (2001), they find that older teachers are under-paid, but conclude that more generous increments linked to years of experience introduced in 2008 will over the years eliminate this problem (2009 policy developments have however removed some but not all of this deferred generosity). Gustafsson and Patel (2009) emphasise that the employer needs to signal the existence of future incentives to prospective teachers in an active manner as they are not visible if the prospective teacher simply looks at what older teachers are currently earning. Armstrong (2009) finds that the incentives to stay within the teaching profession are stronger for those teachers with fewer years of training.

The second key area of analysis looks at incentives in the more typical sense, in other words at incentives given to those who perform exceptionally well. Despite such incentives being a highly topical policy issue, there has been little work of an academic nature in South Africa on this subject. There are arguably two key things that should inform the policy process. One is better data on the choices teachers make and their perceptions. To some extent such data are collected in programmes such as SACMEQ and the Systemic Evaluation. However, a dedicated and nationally representative teacher survey, something that has not been conducted in South Africa previously, would be of enormously greater value. In the absence of data from such a survey, the policy process ends up relying too heavily on the assumption that teacher unions are able to represent adequately what incentivises teachers, an assumption that will clearly not always be a sound basis for policy.

The second need is for a South African adaptation of theory from elsewhere relating to teacher incentives. Because the actual implementation of performance incentives for teachers, in developing and developed countries, is rather limited, and the effectiveness of the programmes that do exist has often not been properly studied, much of the emphasis must currently be on simply clarifying what economic principles have to say about the design of optimal incentives. The value of clarifying key concepts should not be under-estimated. In particular, there is a need for a better taxonomy of teacher incentives and their likely intended and unintended consequences. In South Africa there has arguably not been enough consideration of the full range of options, and it has been assumed that incentives for individuals are as workable in public schools as they are in the private sector. Because the hierarchy amongst teachers in schools is traditionally rather flat, and because educational quality is inevitably a team effort where the impact of individual teachers is difficult to determine, rewarding individual teachers may have a divisive effect, as opposed to an efficiency enhancement effect. Insofar as the literature supports performance incentives, it tends to support incentives for whole schools, rather than individual teachers.

Chile is perhaps the developing country that has gone furthest in developing teacher incentive programmes, and in analysing its existing practices. In particular, Chile provides valuable lessons in the design of teacher incentives pegged at the school, and not individual level (Mizala and Romaguera, 2005). A rare example of a randomised evaluation study focussing on the effects of teacher incentives is documented by Muralidharan and Sundararaman (2006). The study, which used a sample of primary schools in India, found clear evidence that monetary incentives for teachers improved test results.

5. BENEFIT-INCIDENCE ANALYSIS

A society where it is widely felt that people's opportunities in life are unfairly distributed cannot be a healthy society. In the economic literature, recent empirical evidence indicates that where inequality in developing countries is great, economic growth is retarded (Barro, 2000). As the foregoing discussion has suggested, social and income inequalities are perpetuated by unsound education policies that fail to educate the poor. Whilst society waits for educational changes to take effect, the redistribution of resources through the tax system and pro-poor spending policies can, firstly, assist in alleviating poverty and, secondly, eradicate poverty through, in particular, investments in the education of the poor. The second aim, of actually eradicating poverty, is the more difficult one, and is conditional on effective spending policies and practices.

Benefit-incidence analysis typically uses a combination of unit cost figures from public accounts and data on the use of public services from household surveys to draw conclusions such as that 35% of public spending goes towards the poorest 20% of the population, and that public spending is thus pro-poor. Comparisons between countries using the same approach can reveal important patterns. For instance, Davoodi et al (2003: 21) argue that Sub-Saharan Africa has been particularly unsuccessful at targeting public education spending towards the poor. For example, at the secondary level only 7.4% of spending goes towards the poorest 20% of the population on average.

In South Africa, Van der Berg (2005 and 2009) has calculated benefit incidence patterns for a range of public services, including education. This analysis indicates that public spending in 2006 on primary and secondary schooling was clearly pro-

poor, and well targeted by international standards (Van der Berg, 2009: 13). It also reveals that between 1993 and 2006 there has been a clear trend towards better targeting of the poor (Van der Berg, 2005: 8 and Van der Berg, 2009: 14). The public funding of tertiary education reveals a different pattern. As in virtually all countries, in South Africa this funding is pro-rich, though in South Africa it is even more so than elsewhere. Van der Berg (2009) explains that this finding could be influenced by an important data problem, namely that in the household data poor students living away from their families are likely to appear artificially better off than their families of origin actually are.

Van der Berg (2009) points to a few common areas of misunderstanding. The standard benefit incidence approach of examining the breakdown of public education spending by quintile of the population means that the age pyramid of different segments of the population will influence the results. Above all, if a larger proportion of the poor are young, which is the case in most countries, then a pro-poor pattern will emerge even if the state spends an equal amount on each pupil. In fact, if just public spending per enrolled pupil is considered, then public spending is slightly pro-rich, and not pro-poor as seen in the typical benefit incidence analysis approach (Gustafsson and Patel, 2007). It is obviously important for education policymakers to recognise the differences between the two approaches.

The finding that education inputs, at least at the schooling level, are more or less equitably distributed is an important finding for policymakers as it provides evidence that ambitious post-1994 policies to correct the highly distorted spending patterns of the apartheid era have paid off. There is thus ample empirical justification for the current and rather strong policy shift away from education inputs and towards

education outcomes. Clearly there are education input issues that must still be resolved, but devoting the bulk of the policy attention towards outcomes appears completely justified and necessary.

Substantial public funding for the poor in South Africa would suggest that private inputs would be low. The evidence suggests that this is the case. The analysis by Gustafsson and Patel (2006: 71) indicates that overall around 8% of the funding of public schools is private, though for the poorest two quintiles it was around 2%. Kattan and Burnett (2004) find that private inputs into public primary schooling in many other developing countries are at a substantially higher level: 21% in China, 43% in India and 30% in Ghana. They moreover find that policy analysis into private inputs into public primary schooling is often confounded by definitional problems. Many countries that claim to have abolished 'fees' in fact still demand parents to pay, for instance, for textbooks because textbooks are not regarded as a part of 'fees'. UNESCO's definition of fees (at least as it appears in UNESCO, 2002: 55) seems to support the notion of textbooks not being a part of fees, though many policy analysts would view things differently. In South Africa, at least anecdotally, the newly declared no fee schools for the poor have in many cases simply renamed what were previously 'fees' as 'voluntary donations'. Though private contributions to schooling in South Africa may not be large, at least by international standards, they receive considerable policy attention and warrant better analysis. For this, Stats SA's Income and Expenditure Survey data would be useful. But apart from clarifying the numbers, it is necessary to gain a better idea of the reasons why even parents in poor communities often encourage private contributions into the school fund. It is unlikely that insufficient public funding is the only reason. There are probably also reasons relating to the way schools are viewed and utilised by parent communities.

6. CROSS-COUNTRY MODELS

Even simple cross-country comparisons can be very informative for policymakers. Often they are able to correct misperceptions or at least nuance existing perceptions within one country. In the case of South Africa, they have indicated that although the top decile of pupils, in terms of test results, perform exceedingly well compared to the remainder of pupils, they in fact do not perform well compared to the top decile of other middle income countries (see for instance Mullis et al (2004: 34)). Despite the common perception in South Africa that too many pupils drop out of education before the completion of twelve years of schooling, a cross-country analysis reveals that in terms of secondary school completion South Africa is slightly above the average for similarly developed countries (Gustafsson and Morduchowicz, 2008: 28).

The increasing availability of internationally comparable educational quality data have allowed for new insights into education and country development. Above all, these data have allowed the adaptation of the traditional cross-country growth models so that they include a consideration of educational quality, and not just years of schooling. This adaptation has profound education policy implications. Above all, it is implied that focussing exclusively on increasing enrolments in developing countries, without explicitly considering improvements in pupil performance, can be misguided (Hanushek and Woessman, 2007).

Statistical inference becomes difficult in cross-country models due to the unavoidable fact that the number of countries in the world are limited. Techniques to deal with these difficulties exist (Sala-i-Martin et al, 2004), yet cross-country analysis must inevitably be a mix of statistical analysis and careful assessment of historical and political context.

There seem to be two areas of exploration with respect to cross-country analysis that should interest education policymakers. Firstly, as summarised recently by Stiglitz et al (2009), there are important debates about what country development indicators policymakers should be focussing on. Clearly, the traditional economic growth or GDP per capita indicators are inadequate on their own and too much focus on them can be dangerous, for instance if income inequality is ignored. However, development models using non-traditional dependent variables such as happiness or freedom from poverty are still rare, partly due to data availability problems. Yet one potentially valuable data source that has received little attention in this regard is the World Values Survey (http://www.worldvaluessurvey.org/). South Africa was one of 54 countries participating in the 2005-2008 wave of this survey. For South Africa, responses were collected from 3,000 adults relating to education, a variety of political and social values, and one's sense of satisfaction with life. The data lend itself to both cross-country and one-country analysis.

The second area of exploration is cross-country models designed to predict not a development indicator such as GDP growth, but educational quality as measured by standardised test scores. In such models explanatory variables would cover education policy choices made by particular countries. What is currently rather clear from the literature is that a policy intervention that does *not* appear to be associated with better educational quality is higher spending per pupil (Hanushek and Woessman, 2007: 60). Bishop (1997) offers one of the few cross-country models currently in existence indicating something that *does* appear to contribute towards better quality, namely the presence of standardised examinations. Bishop's (1997) focus is on developed countries. Similar analysis including developing countries and other policy variables

such as age of entry into schooling and level of parent involvement in schools is likely to be useful for policymakers.

7. CONCLUSION

The five models used to organise the discussion in the previous five sections do not encompass all that there is in the economics of education field. In particular, two more operational areas of analysis have been excluded. One is the estimation of ideal unit costs in, say, primary schooling for countries at a particular level of development. Psacharopoulos (1996), in a paper which, like this one, explores a possible economics of education agenda, emphasises the need for work in this area. The second area is teacher supply and demand analysis. Here too little work has occurred in South Africa. Crouch (2001) puts forward a simple model for South Africa, but as he himself admits, it is exploratory.

Within the previous five sections, not all the work that has occurred in South Africa in these five areas, but rather a selection of this work, has been discussed. Arguably, output in the form of economics of education papers in South Africa seems comparable to the level of outputs in other middle income developing countries. However, this is not the same as saying that the level of output is adequate to inform the range of often very pressing policy questions. Above, it has been argued that there are important areas where more should be done (production functions, for instance) and areas which have barely been touched (teacher incentives, particularly). The most critical gap seems to be the absence of theoretical and empirical work relating to teacher incentives, in the broadest sense of the word. Teachers are at the centre of the education process, and yet the factors that influence their current productivity, and the factors that might improve that productivity, are not well understood.

An economics of education research agenda for South Africa, based on the discussion in the preceding sections, may look as follows.

Rates of return. Here a clearer sense of what the typical rates of return analyses mean for policymakers is important. Put differently, what needs to change in our education policies for the rates of return to improve? Perhaps some atypical rates of return analysis that took into account the qualifications that people have would throw new light onto what should be done with the qualifications structure of the schooling system. Rates of return comparisons of general and vocational education could become an important empirical input into the current policy shift towards higher enrolments in FET colleges.

Production functions. Considering that these models are most informative for policymakers when there are many of them, it is important to build on the stock of existing local literature and to perform periodic meta-analyses. Policymakers are best served by production function analyses that incorporate a final cost effectiveness step, so that the meaning of the coefficients can be understood in familiar language. Class size thresholds are a matter that seems to deserve more focussed attention.

Teacher incentives. Periodic comparisons of teacher pay to pay in other professions will always be necessary. With regard to teacher incentives, there is much work to do. What can be done without new data is to apply the knowledge that has been gained in other countries, with respect to theory, empirical evidence and policy design, to the South African context in order to clarify key issues around which there is still too much confusion. New data on the behaviour and preferences of South Africa's teachers would greatly assist in determining what kinds of incentives will work best.

Benefit incidence. Here it is necessary to build on the existing stock of standard benefit incidence analysis to monitor the progressivity of public spending into the future. Further interrogation of the socio-economic status of tertiary students might produce revisions of the country's very regressive distribution of public expenditure on tertiary education. The incidence of private spending on education could be better investigated with the existing data.

Cross-country models. Exploring the relationship between education and non-traditional country development indicators (other than growth or per capita income) represents an exciting frontier. The same can be said of cross-country models that explore the impact of the education policy choices that countries make on education outcomes, in particular educational quality.

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