Appraising and Testing World Bank Maintained Hypotheses on Basic Education in a Comparative Institutional Context

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Appraising and Testing World Bank Maintained Hypotheses on Basic Education in a Comparative Institutional Context[1]

Shahrukh Rafi Khan

Abstract

Given how influential the World Bank is in the development field and given the structural changes it can bring about in most borrowing countries in most sectors, it is important to examine its policies carefully. We use the education sector in Pakistan as a case study for this purpose and conceptually and empirically examine several World Bank endorsed or maintained hypotheses. We have conceptual reservations on important policy initiatives that have been implemented and/or are being endorsed. However, we refute several but not all the maintained hypotheses.

I.   Introduction

The World Bank is one of the favorite targets for thinkers and writers on development issues. This is not surprising, since it is among the most influential actors in development. Its influence results from its direct and indirect control over development resources and from its enormous body of in-house and contracted research and publications on development issues.[2] The Bank is a moving target. Its openness to criticism and its willingness to absorb or co-opt ideas of critics seem to be more than just a public relations exercise. However, there is still a hard core of market oriented economic philosophy that critics contend is driven more by ideology than evidence. The education sector in Pakistan provides an interesting case study of the Bank's flexibility and willingness to absorb new ideas and for appraising and testing its maintained hypotheses.

The expression maintained hypotheses, as used here, requires some explanation. For example, estimating rates of returns, which has become a growth industry in the economics of education literature, is drawn from human capital theory. While no authorship is being attributed to the World Bank for this, however, the Bank literature clearly maintains that this theory is valid and has actively promoted policy based on the estimation of rates of return.

Thus the Bank's influence in the education sector in Pakistan include the promotion of Bank research showing a much higher social rate of return to primary education (classes 0-5) which coincided with the restructuring

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2   **The direct control over resources is its annual lending program and the indirect control is the considerable influence it exercises on other multi-lateral and bi-lateral aid agencies. This also applies to the IMF, the Bank's sister organization. The Fund is much more uncompromising in its economic philosophy. Notwithstanding some probably sincere statements about a concern for poverty made by senior Fund officials, there is much less dust clouding what the Fund stands for.**

of expenditure within the education sector towards primary education.[3] Primary education expenditures during the *Sixth Five Year Plan* was 23.6 percent of the total educational expenditure and this increased to an allocation of 47.5 percent of the total for the *Eight Five Year Plan*. Allocations at all other levels, except for teacher training, declined with expenditure at the college/university level declining from 19.5 percent of the total to an allocation of 10.7 percent.[4] Having seen through the restructuring of educational expenditure to the primary level, the Bank was well placed for an exclusive focus on basic education (classes 0-V) as part of the Social Action Program (SAP) being implemented in rural Pakistan.[5]

Since the Bank is such a major player in development, the objective of this paper is to take a close conceptual and empirical look at the Bank's maintained hypotheses that pertain to basic education. In the second section, we discuss conceptual issues and identify hypotheses for testing. In the third section, we describe the research design, sampling and data. In the fourth section, we describe the method and present the results of testing hypotheses identified in the second section. We end with a summary of findings.

II.   Conceptual issues and testable hypotheses

The implied recommendation of the proposition that the social rate of return to the primary level of education are the highest is a restructuring of educational expenditure towards primary and away from higher education as indicated in the introduction.

One can question educational expenditure restructuring based on social rates of return to education.[6] Implicit in the notion of rates of return to education is the acceptance of the decomposition of education into separate levels. While this may be necessary administratively, expenditure decisions need to be made in a manner that takes into account the linkages between the different levels. More expenditure at the primary level requires expenditures on secondary and teacher education to produce more good quality teachers. Thus improving the state of primary schooling is not possible without also simultaneously improving secondary and teacher education, which in turn requires improving the quality of higher education.

The allocation decisions based on rates of returns have also been challenged on a more fundamental level. The human capital theory underlying rates of return analysis is that, at all levels, education leads to higher productivity compared to the earlier level and the higher productivity is rewarded by higher pay on the job market. Scholars have questioned both these linkages on various grounds.[7] However, even if one were to accept the assumptions underlying human capital theory, basing current reallocation decisions that pertain to the future of current generations on the current aggregate experience of individuals on the job market would still be questionable.

An essential ingredient for computing rates of return to education, based on household survey data, are the

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3   **Psacharopoulos (1994) at the World Bank has compiled the relevant evidence based on Bank research and other studies.**

4   *Seventh Five Year Plan 1988-98*, **(1988, p. 417),** *Eighth Five Year Plan 1993-98*, **Draft Report on Education and Training Sector, Annexure I.**

5   **The other social sectors covered by SAP include primary health care, drinking water supply and sanitation and population and welfare.**

6   **For an extensive review of other methodological critiques refer to Schultz (1988).**

7   **Gender barriers and discrimination would in particular sever such links. Khan (1993, pp. 17-18) cites references to the relevant literature, including to alternative explanations of why the links posited to exist by human capital theory may not hold.**

construction of average age-earning profiles of individuals in the sample for each level of education. The difference between a higher and a lower level over time is assumed to constitute the average benefits from the higher level of education. However, there is no guarantee that the current earning profile will necessarily be reflective of the future. This is particularly the case when there is job up-gradation with the spread of education so that employers start demanding higher academic qualifications for less skill or knowledge intensive positions. In such a situation, a snap shot of the current age earning profile can be quite misleading about the future education-earning scenario.[8]

If one assumes that individuals are rational, a fundamental postulate of human capital theory, then individuals should start reacting to market signals and start seeing the primary level merely as a stepping stone to higher levels of education. Thus, looking to the future, much of the value of the primary level of education, from the point of view of parents making the investment, is that it is a stepping-stone for the higher levels of education. If that is the case, the presumption that one can sensibly decompose levels of education and separately calculate rates of returns to different levels of education once again comes into question.

Given these and other problems with rates of return analysis, one would have to make a justification for focusing on elementary education on other grounds. If fact, one can make strong arguments for such investments on both equity and efficiency grounds. Without being assured a start by the state via quality education, individuals below the poverty line may be completely denied any hope of realizing their intellectual potential and any hope for social mobility.[9] By providing an initial opportunity for intellectual growth at the widest level, such investment is equitable since it can reach a large number of those who would otherwise be deprived and it is efficient because by thus casting the net widely, in theory, the potential of the largest number can be tapped. Thus, due to equity and efficiency considerations, the state should ensure a basic education to all those not catered to by the non-government sector.

There is a huge World Bank literature on education. Since there is consistency in the viewpoint expressed in reports written for various countries, we have concentrated on recent reports written in the Pakistani context to identify important additional observations and hypotheses.[10] Among the observations are that government schools are so weak that it would be sensible to consider subsidies for the private sector and NGO schools (World Bank 1996, p. 12 and 1997, p. 12). Private sector schools are found to have lower unit costs due to lower teacher pay but better attendance and student performance. Similarly, subsidies are recommended for private teacher training colleges (1996, p. 37).

The reasoning for such subsidies may not be altogether sound on either market failure or equity grounds. The flat rate per student subsidy recommended for the better performing private sector schools is probably premised on the positive externalities expected to result from education. The existence of such externalities has been questioned, and even if they exist, they do not justify subsidizing a private sector activity.[11] There is little moral justification for the rest of society subsidizing a "for profit activity". Alternative ways of encouraging schooling, including via the non-profit sector, can be found. Second, such a policy would create

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8   The computation of social rates of return to education, as opposed to the private rates of return; requires making several adjustments to arrive at estimates that more closely measure the contribution of a certain amount of schooling to society after accounting for market failures. However, the problems that we identify here carry over to the measurement of the social rate of return.

9   Government of Pakistan (1998) shows that, at the moment, many poor children are either not attending school or dropping out if they do attend.

10   These include World Bank (1996) and World Bank (1997).

11   Behrman, J. R., (1990).

a moral hazard problem. Schools would be tempted to inflate reported enrollments to justify higher subsidies. Third, such subsidies do not discriminate between the poorest and the relatively more prosperous families. In fact, as pointed out earlier, evidence shows that the poor are systematically being excluded from schooling. It may therefore be more sensible to target the subsidies to the poorest families.[12]

There are various other hypotheses maintained in the World Bank literature on education that are not as provocative but nonetheless important to test. These include the hypotheses that in-service training is preferable to pre-service training; that relaxing teacher qualifications, raising class size, and multi-grade and multi-shift teaching would not hurt the acquisition of cognitive skills; and that user fees do not result in dropouts.[13] The commonality in all these hypotheses is that they generate cost saving, a major concern of World Bank led structural adjustment.[14]

III.   Research design, sampling and data

The hypothesis testing done in the next section is embedded in a comparative institutional context. The World Bank literature suggests that private and NGO schools are more efficient in producing results with the same or more limited resources. We collected data based on a small high quality sample survey that required extensive fieldwork carried out in the four provinces and a federally administered territory of Pakistan (Punjab, Sindh, Balochistan, the NWFP and the Northern Areas) between September and December 1998. The sampling design was to randomly select NGO schools from available sampling frames, since they are the smallest in number, and to then pick the closest private and NGO school.[15] To ensure that we were comparing the same level of schooling across NGO, private and government schools, many of the listed NGO schools were excluded since they ran informal schools while the government and private sector schools are mostly formal. In all, 43 NGO schools were included in the sample and we visited 43 each of the closest government and private schools.

While, this kind of paired sampling extends the random selection to the paired categories, the final selection of government schools is still an insignificant percent of total government schools.   Thus, while we managed to ensure comparability, the small sample of public sector schools needs to be kept in mind in interpreting the results. The details of the sampling and fieldwork are provided in Appendix I.

The fieldwork involved a total of ten questionnaires, which can be made available on request. These included questionnaires soliciting information from students, teachers, households and communities.   We also administered tests to assess class V students for cognitive skills in mathematics and comprehension and also administered tests to ascertain math and comprehension cognitive skills of the class teacher of class V.

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12 **Eds. van de Walle and Nead (1995), particular the paper by Sen.**

13 **The World Bank (1997) report on education in Pakistan asserts that good primary education is possible with 35-40 students per teacher.**

14 **A useful source on the Bank's maintained hypotheses in a structural adjustment context is Carnoy (1995).**

15 **Our focus was on rural education since public sector rural education is in a much greater state of disarray than urban education and the policy goal of the research was to suggest solutions for improving public sector education, by far the largest provide of schooling in rural Pakistan.**

IV.   Method, hypothesis testing and results

Our approach to testing the various hypotheses identified in section II is to use a crude production function approach with mean class V student cognitive skills (performance on math and comprehension tests) as the output and various mean teacher and school characteristics as inputs. Thus the unit of analysis is the school with the total sample size of 129 schools.

Sabot and Wakemann-Linn (1990) argue that production theory provides a reasonable theoretical underpinning for the statistical models estimating the determinants of performance.[16] At best, this holds true in a very crude input-output sense.   In this approximate sense, teacher quality, teaching resources, student ability, student traits and socio-economic status could be viewed as the inputs and student performance as the output.[17]

The basic production function estimated was as follows:
Performance = P (ST, SC, TQ, TT, OTC, SF)   (1)
Where

ST	=	School type (government, private or NGO).
SC	=	School characteristic (single grade teaching, single shift operation)
TC	=	Teacher qualifications (matriculate (class 10), higher secondary, bachelors and masters).
TT	=	Teacher training. This includes pre-service training (primary teacher certificate (matriculation equivalent), certificate of teaching (higher secondary equivalent), higher qualifications (bachelors and masters equivalent) and in-service training.
OTC	=	Other teacher characteristics (experience and teacher performance on math and comprehension tests).
SF	=	Index of school facilities (School facilities is a composite index that in principle could range from 0 to 23 (actual mean and standard deviation are 14.6 and 3.9 respectively) depending on access to facilities like lighting, desks, chairs, textbooks, notebooks, water, electricity, fans, washrooms, boards, chalk, charts, maps, models and library etc).

We first estimated the basic production function identified in equation 1 (results not reported). The most significant findings from the estimates of both the math and comprehension production functions are that NGO and private schools produce significantly much better results both statistically and quantitatively. NGO schools scored 1.54 and 7.55 points higher than government schools in math and comprehension tests which are 35 percent and 56 percent of the respective overall mean scores. Private schools scored 1.10 and 4.67 points higher than government schools in math and comprehension tests which are 25 percent and 35 percent of the respective overall mean scores.

By including interaction terms for NGO and private schools, we were able to decompose the variables that made a difference. The full set of interaction terms also helped us avoid having to estimating separate production functions by school type, which is not viable given that we have 129 observations in all. We also estimated an extended regression model with other relevant variables such as whether it was a single gender school, students were provided help after hours, teachers provided private tuition (and consequently taught less in class), being a teacher was the first profession of choice, curricula was

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16   **For a more detailed discussion of the method and qualifications as applied to university education refer to Khan (1997).**

17   **Performance is also likely to depend on non-observable student traits and innate ability.   We get around this problem by assuming a normal distribution of these traits and innate ability within the class.**

selected by the school, regular inspections and teacher absentee rates. While most of these variables were not significant, including them in the model proved valuable, since it demonstrated that the regression parameters of the "core" statistical model were stable.[18] Table 1 below presents the results of the extended production function with interaction terms.

Table 1: Determinants of class five comprehension and math performance

Predictors\Dependent variables	Comprehension	Maths
Constant	5.023***	-0.169
	(1.718)	(0.181)
School Type and Characteristics		
NGO	3.458	1.196
	(0.728)	(0.069)
Private	6.316*	- 0.149
	(3.997)	(0.074)
Single grade teaching (SG)	-0.077	- 0.321
	(0.088)	(1.092)
Single shift school (SS)	3.016*	2.387*
	(3.227)	(6.877)
NGO * SS	- 5.870*	- 1.972**
	(3.354)	(2.318)
NGO*Primary school	-	1.173**
		(2.382)
NGO*Middle school	-2.477**	1.195**
	(1.973)	(2.169)
Teacher Qualification		
Higher secondary	0.038	0.190
	(0.266)	(0.486)
Bachelors	-0.666	0.395
	(0.454)	(0.880)
Masters (MA)	- 5.288**	0.289
	(2.219)	(0.584)
NGO * MA	4.341**	-
	(2.063)	
Private * MA	8.538*	-
	(2.910)	
Teacher Training		
Certificate teaching (CT)	- 0.901	0.207
	(1.042)	(0.564)
Private * CT	-	- 2.050*
		(2.248)
Higher teaching certificates	2.640**	0.757***
	(2.302)	(1.782)
In-service training (IST)	0.389	0.615**
	(0.469)	(1.974)

Continued…..

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18   **Establishing robustness was not the purpose of this exercise and hence no formal sensitivity analysis was attempted.**

Predictors\Dependent variables	Comprehension	Maths
NGO * IST	-	- 1.228[*]
		(2.535)
Other Teacher Characteristics		
Experience (Exp)	0.299[**]	0.099[*]
	(2.400)	(3.165)
NGO * Exp	-0.301[***]	-
	(2.024)	
Private * Exp	- 0.295[**]	- 0.101[*]
	(2.332)	(3.005)
Teacher performance (TP) in comprehension/math	0.004	0.239[*]
	(0.055)	(5.375)
NGO * TP	0.493[*]	-
	(2.856)	
Private * TP	-	- 0.180[**]
		(1.987)
Other schooling characteristics		
Student-teacher ratio	0.033	0.013
	(0.877)	(1.053)
NGO*Extra help for students	1.776[***]	-
	(1.685)	
School Facilities (SF)	- 0.101	- 0.114[**]
	(0.708)	(2.330)
NGO * SF	-	0.152[***]
		(1.722)
Private * SF	-	0.256[***]
		(1.856)
R bar Sq.	0.32	0.31
F-Stat.	3.73[*]	3.51*
N	129	129

Notes: *   =   Significant at least at the 1 percent level
** =   Significant at least at the 5 percent level
*** =   Significant at least at the 10 percent level
The Brecusch – Pagan test was used to test for heteroshedasticity, and the results are corrected for it. The base categories are government for school type, matric (class X) for teacher qualifications, and primary teacher certificate for teacher training certification. All other variables are binary, with one representing the presence of a characteristic, except for teacher experience, teacher performance and school facilities, which are continuous.

The maximum scores for the math and comprehension tests were 10 and 25 respectively and the means and standard deviations were 4.4 and 13.5 and 1.7 and 5.0 respectively. In both cases, the distributions were smooth and bell shaped. The means are used as a benchmark for the interpretation of the parameters. For comprehension, class V performance in the private schools was significantly and substantially better than in government schools (i.e. 6.31 points higher). NGO or private sector performance in math was not significantly different from that in government schools.

Single grade teaching did not significantly affect performance but performance in single shift schools was better. Performance was 22 percent better than the mean on comprehension tests and 54 percent better on math tests. Higher teacher qualifications did not accompany better student performance with the exception of a negative effect at the masters' level for comprehension tests. Here, the problem may be public sector

teachers with a masters' degree. The mean comprehension score of students who had NGO and private sector teachers with a masters' degree is 4.3 and 8.5 points higher than for students of a class teacher with a masters' degree in the public sector.

Teacher experience is positive and significant, but enhances scores in comprehension and math by just over 2 percent. Higher teacher scores in math enhance student scores in math by 5.4 percent. Higher level teacher training qualifications leads to 17 percent improvement in math scores and a 20 percent improvement in comprehension scores while in-service training added 14 percent to math scores but had no impact on comprehension scores.

School facilities have a negative and significant sign, but NGOs and the private sector with better school facilities had students performing about a quarter point higher than in government schools. As maintained by Bank documents, higher student teacher ratios did not adversely affect performance.

We did not have enough observations to rigorously test the proposition that user charges do not impact school attendance since we were only able to track 17 students who dropped out during the school year. However, 35 percent of these 17 students (the largest among the various categories) mentioned they had dropped out because they could not afford the schooling. This finding confirms the results of a national survey of 12,622 households conducted by the Federal Bureau of Statistics in 1996-97. Once again, schooling being "too expensive" was the largest among the various category of responses and about one-fourth and one quarter of the students respectively dropped out or never attended school for this reason.[19]

Among the variables included in the extended model, teachers who provided extra help to students in NGO schools produced a 13 percent better performance in comprehension. An interesting policy lesson seemed to emerge from the much better math performance (27 percent higher) in NGO primary schools and primary units in middle schools relative to primary units in high schools. However, this finding is negated by poorer performance in comprehension in the NGO middle school primary sections relative to the high school primary section. More empirical support is needed on this and the other findings reported above.

Conclusion

Based on the presumption that the human capital theory based rates of returns to education are is a sound tool for the allocation of resources in the education sector, the World Bank (WB) was instrumental in a massive reallocation towards primary education and away from higher education. However, while rates of returns may be a valuable tool for inter-sectoral allocations, it has several flaws making them suspect as a sensible tool for intra-sectoral allocations. Again, based on evidence that private and NGO sector schools are much more cost-effective than government schools, WB literature has advocated subsidies for the non-government sector which can be challenged on several counts. Apart from discussing conceptual reservations with WB maintained hypotheses, we also tested several other hypotheses, most of which seem to be driven by a cost-saving objective.

There is support for the view that NGO and private schools are more efficient in delivering education. We also found support for several of the other WB maintained hypotheses that push for economies. Contrary to our prior expectations, higher student teacher ratios did not negatively impact math and comprehension test

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19   **Government of Pakistan (nd., pp. 42-43).**

scores, single grade teaching did not improve them and higher teacher qualifications did not have a positive impact on test scores. However, contrary to what the WB maintains, single shift schools and higher pre-service teacher training did have a significant and sizable positive impact on test scores.

Our main concern in this research is with questioning "certainties" rather than with establishing them. Given the size of our data set, we view our results as suggestive. Nonetheless, we believe that the WB needs to be more humble about the certainties it promotes given that some of them may be ill founded and given how influential it is in the development field.

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Appendix I

Sampling and fieldwork for data collection

We started with a Society for the Advancement of Education (SAHE) directory of NGOs involved in education.[20] We soon realized this was not exhaustive, since a number of organizations had not been included. To supplement the SAHE directory, we obtained a copy of the Dataline NGO directories (one each for the four provinces and the Capital) from the Trust for Volunteer Organizations (TVO).[21] This directory had been compiled in 1991, and included NGOs that had registered by the late 1980s. Those that stated that they were involved in education were sent questionnaires to gauge their current status and involvement in education. This process was time consuming and the responses disappointing. However, we managed to complete this process for Balochistan, NWFP and Sindh.

The information sent back pertained mostly to the smaller NGOs and Community Based Organizations (CBOs). Since, we initially planned to include only the larger multiple school NGOs in the sample, we began a fresh to compile a list of larger NGOs, on the basis of the SAHE directory and the NGO grapevine. Our selection criterion was that the NGO be running formal primary schools (i.e. 5 years of schooling).

Initially, for financial and linguistic reasons, the study was to be restricted to the Punjab. It was thought that, as the largest province and with the largest number of NGO interventions, the institutional findings from this province would be, by and large, relevant for the rest of the country. After much searching, 50 NGO schools were selected from the Punjab. Because of the difficulty in finding formal schools, even smaller NGOs were included in the sample. Once in the field, we discovered that a substantial amount of the information reported was inaccurate, even though it had been given to us, in most cases, by the senior management of the organizations in question. The main problem was that many of the primary schools were not running classes I-V as we required.

Because we were not able to find 50 formal NGO schools in the Punjab, we had to expand the scope of the study to include the rest of the provinces. Much of the sampling work had to be carried out on the basis of information received on site, i.e. through various education-related professionals and communities. Substitutions were made when those schools originally in the sample could not be surveyed -- generally because the school did not run five classes, was closed due to Winter break, was non-existent or too far away from a private school to justify a comparison between the two.

The names and locations of schools finally visited can be made available on request. Seven out of the 43 NGO schools finally included in the sample were of one school NGOs. For the multiple school NGOs on the list, we randomly selected about 30 percent of the schools in the Punjab. When the fieldwork in the Punjab was complete, we continued with random selection in the other Provinces to complete the target selection of NGO schools. For the larger multi-school NGOs in the other provinces, the selection ranged from 22 percent to 55 percent. Once the NGO school was selected, we then visited the nearest government and private schools that ran classes up to class 5.   Our objective in pursuing this method was to minimize location influences when comparing schools.[22]

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20 **SAHE (1997).**
21 **TVO (1994).**
22 **About three-fourths (96 of the 129) of the schools were mixed, 18 were all girl and 15 were all boy schools.**