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Rationale for Public Investments in Primary Education in Developing Countries

Background Paper for the Evaluation of the World Bank's Support to Primary Education

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Abbreviations and Acronyms

CGEs	Computable General Equilibrium models
EFA	Education for All
FTI	Fast Track Initiative within EFA programs
GER	Gross Enrollment Rate
MDGs	Millennium Development Goals
NER	Net Enrollment Rate
OED	Operations Evaluation Department
OLS	Ordinary Least Square multiple regression analysis
TIMSS	Third International Mathematics and Science Study
UNESCO	United Nations Education, Scientific and Cultural Organization
UPC	Universal Primary Completion
UPE	Universal Primary Education

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1.   Introduction

1.1   The purpose of this paper is to review the literature on the rationale for public investments in primary education, especially with respect to recent international initiatives such as Education for All (EFA) and the education Millennium Development Goals (MDGs). The EFA initiative originally goes back to the World Conference on Education for All (1990) in Jomtien, Thailand, where the commitment was made by many international development agencies, including the World Bank, to achieve universal primary education for all children by the year 2000. This goal was not achieved, but was reaffirmed at another international conference on education in Dakar, Senegal (April 2000) with a new target date set for the year 2015. These education goals were then included in the set of eight MDGs adopted by a United Nations conference in September 2000.[1] The pursuit of these costly and difficult, but laudable, goals by the Bank and other public agencies has been based upon economic, social, and political arguments. The main point of this paper is to review the literature that assesses the justifications, economic and non-economic, for public investment in pursuit of these goals.

1.2   With respect to the economic arguments, the paper will begin by exploring the theory of human capital development and related concepts as a basis for public investment in primary education. It will make a distinction between private and public rates of return. It will then survey the micro-economic and macro-economic evidence in support of a strong focus on primary education.

1.3   The non-economic arguments for public investment revolve around the social benefits from investing in primary education, such as greater social cohesion and a strengthened foundation for democracy. These benefits are generally not thought of as economic ones, but they may serve as background for social stability that would allow economic benefits to bear fruit. However, it must be noted that these social benefits of primary education are not automatic and depend upon the nature of the primary education system. It must also be noted that social cohesion, democracy, and political stability are not synonymous, as can be shown from the recent history of many troubled countries. Health benefits are sometimes also cited among the social arguments for public investment in primary education, but this paper will consider them mainly under the economic arguments, for reasons that will be elaborated in the next section.

1.4   The humanitarian and political arguments reviewed are rooted in the human rights movements of the 20th and early 21st centuries (e.g., Universal Declaration of Human Rights, Convention on the Rights of the Child). Widespread agreement on these basic rights have been translated into growing political support for the achievement of Education for All at the national and international level. Thus, humanitarian arguments have become political ones. The key question is whether or not such arguments can be

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1. Although the Jomtien Declaration 1990 pointed out that learning outcomes were also very important, the followup seemed to more concerned with the EFA goals of universal net enrollment rates. Again, in Dakar 2000, EFA was specified in terms of universal completion of primary education of good quality. However, the education MDGs of 2000 adopted universal completion but dropped the emphasis on good quality. As the acquisition of cognitive skills versus years of schooling is shown to be important in this review, these distinctions are not trivial.

translated into political consensus that can in turn be transformed into sustainable financial and management strategies on the part of development countries and their development agency partners.

2.   Economic Arguments for Public Investments

Theoretical Justification

2.1   One of the strongest and most often used arguments for investment in primary education is the economic argument based upon the concept of human capital. The basic premise of human capital theory is that investment in human resources results in improved productivity.[2] In theory, the costs of the investments can be calculated along with the benefits of improved productivity, and an economic rate of return can be assigned to human capital investments, just as to any other type of investment. Usually education and training are referred to in human capital theory, but this paper will follow the broader notion of many economists and include investments in health care that result in a more productive labor force. Since the theory of human capital was developed by Becker (1964), Schultz (1960), and others, researchers have accumulated extensive evidence supporting its general validity.

2.2   Researchers and policy analysts have drawn the important distinction between the private and social rate of return to primary education. Private returns are the private benefits, after taking into account private costs, that families obtain from investing in education, both as a stream of earnings and as consumer or cultural goods. By way of contrast, the social returns are defined to take into account social benefits and costs, including the private ones. Differences between private and social returns can be traced in part to the existence of wider social benefits and how the existence of these social benefits gives rise to a number of market failures or imperfections. First, it is often argued that there are positive externalities from investing in primary education. These positive externalities are a number of social benefits that accrue from primary education, such as improved public health, diffusion of democratic values and practices, and more freedoms for individuals in society. Second, and more related to how these externalities arise, there can be information asymmetries, for example, when parents with little education do not realize the benefits of investing in primary education for their children. Third, there can be credit market imperfections that prevent low- and middle-income households from overcoming budget constraints by borrowing for primary education, even when the private rate of return is high. Finally, government tax and subsidy policies can also alter the calculation of private versus social rates of return.

2.3   The existence of social returns provides a rationale for public investment in primary education. Those based upon credit market imperfections are particularly salient for the

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2. Here productivity refers to labor productivity, i.e., output per unit of labor. This can be output per worker or output per hour worked, depending upon the statistics available. Of course, labor productivity also depends upon the amount of capital and technology available per worker. The section on macroeconomic growth and education will discuss this in more detail.

poor, since they often have difficulty borrowing to cover the costs (direct and indirect) of schooling. To capture the increased output that presumbly accrues to education for all, government finance would thus be needed. But this argument is more limited in scope than the overall externality argument. First, it only invokes the private productivity increases accruing to the individual being educated. Second, it does not apply to the well-off families, but only to those who cannot afford to pay for primary education. If the government provides free or subsidized primary education for all, then some would be subsidized who would have financed it privately in the absence of subsidies.

2.4   Human capital arguments based upon the above began to replace the manpower planning approach the Bank had relied upon for much of its early economic work in education lending during the 1960s and 1970s. The manpower planning approach attempted to forecast what high- and middle-level occupations would be needed to promote economic growth, and then attempted to put in place the education and training programs needed to supply the manpower required for those occupation. However, difficulties with forecasting economic growth and manpower requirements by occupations led the Bank to abandon that approach (except in special circumstances) in favor of a more general human capital analysis using rates of return to education.

2.5   The Bank Policy Paper on Primary Education (1990) and subsequent education policy papers (1995, 1999) basically argued along the human capital line of thought. They pointed out that education is the cornerstone of economic growth and social development, and that primary education lays the foundation for a more productive labor force through promoting literacy and numeracy. Primary education also provides the foundation for secondary and tertiary education and training. The policy paper showcased research showing how primary education has direct and positive impacts on earnings, farmer productivity as well as health and poverty alleviation benefits.

2.6   Other international public agencies, governments, and academics have substantially agreed with the general interpretation of the human capital justification for public investment in primary education. Even the so called "Washington consensus," despite all of the controversy generated over its macroeconomic and trade policies, argued that public investments in primary education and basic health care were justified on public economics grounds (see Williamson 2002). Furthermore, academic critics of the Bank and the Washington consensus do not dispute this public economics rationale for primary education. Their critique is that is that this public economics rationale is emphasized too much and leads to neglect of other important aspects of education (see Rose 2003).

2.7   It should also be noted that public expenditure on primary education is seen by some as a public consumption good, with the same case for being subsidized as that of public parks, art, and culture. While such consumption is not a merit good in the way that access to food and clean water is, it is still a matter of public or collective choice, and thus influenced by how much a given society can and is willing to pay .[3] While there is some

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3. Few proponents of primary education argue that it is a pure public good. Textbook definitions (see for example Stiglitz [1988] "Economics of the Public Sector") usually include, among others, the following defining attributes of pure public goods: non-feasibility of rationing, rationing being undesirable or extremely costly, and marginal cost of additional consumer being zero. The externality attribute comes closest to making primary education a quasi-public good.

analytical basis for this position, this paper is concerned with education as a public investment and will thus not delve into arguments for primary education as a public consumption good. The next two sections will survey the microeconomic and macroeconomic evidence for an economic justification of public investment in primary education, and how robust that evidence might be.

Microeconomic Evidence: Education, Earnings and Productivity

2.8   Because so much of the research on rates of return to education is based upon using the education and earnings relationship to estimate education benefits, it is useful to start with a review of that work. Since the seminal work on human capital by Becker, Mincer, and Schultz in the 1960s and gathered together in Mincer's book on education and earnings (1974), economists most often have investigated the relationship between education and earnings for individuals in the form of the semi-logarithmic earnings function. This relationship is usually specified as:

Equation 1:

$$Ln\,(E) = a + b \times S + c \times X + d \times X^2 + e \times Z + u$$

Where: E = some measure of earnings (hourly, monthly or annually),
                   Ln (E) = the natural logarithm of E,
                   S = years of schooling,
                   X = years of work experience,
                   X^2 = the square of years of work experience
                   Z = other variables that could be deemed important, such as gender.

2.9   The intercept term is represented by a, and the coefficients of the above variables are represented by b, c, d, and e. These are estimated by some form of multiple regression analysis, with the stochastic disturbance term of the equation being represented by u (see Annex A for further details about econometric issues in estimating the earnings function). Other variations of this specification are often used, but this equation can serve as a framework for discussing the debate surrounding the education-earnings relationship.

2.10   From the private point of view of an individual investing in education, it would be worthwhile if the private rate of return were great enough, no matter what the economic interpretation of the education-earnings differential. However, the public economics rationale depends upon the existence of evidence for the productivity enhancing effects of education and the kinds of positive externalities or market imperfections that would go beyond just the benefits captured by individuals (see next section on externalities). Even if there were no positive externalities, but only individual productivity benefits, the presence of credit market constraints, especially for the poor, would present a public economics rationale for intervention. It should be noted that most researchers do not believe that the earnings function reflects the presence of external benefits to society since they are based upon individual survey data. Nonetheless, earnings functions play a critical role in public policy formulation since they can give information about the potential earnings that could accrue from education.

2.11   A review of earnings function research in developing countries done by Glewwe (2002) lends support to the human capital interpretation of the education and earnings association. Glewwe's review focuses on earnings functions, which include measures of both ability and cognitive skills based upon administering tests to the household members or workers in sample surveys from six developing countries (Ghana, Kenya, and Tanzania in single study, Morocco, Pakistan, and South Africa). The Ravens Progressive Matrices were used as tests of ability and tests of literacy and numeracy were developed and administered as a test of cognitive skills acquired from school (see Annex A for discussion of the econometric issues arising when ability measures are not available).

2.12   These variables were used in the Mincerian earnings function in addition to the standard variables. After reviewing some of the methodological problems, such as sample selectivity, which he judges do not detract from the validity of these studies, Glewwe concludes that cognitive skills acquired in school play a much stronger role than ability (as measured by the Ravens Progressive Matrices) or simply years of schooling in determining earnings. These results present credible evidence that exclude screening or credentialism as the main causes of the education and earnings association. Instead, they support human capital interpretation of the earnings function as being the result of the productivity enhancing effect of education.

2.13   This human capital interpretation of the earnings function has not always been such a dominant interpretation of the education-earnings differential. The credentialism and screening interpretations mentioned above occupied a significant part of the literature during the 1970s and 1980s as alternatives to the human capital interpretation. Credentialism held that it is the certification or credentials effect of education that is used by employers to rank job applicants, while screening posited that education screens out job applicants according to pre-existing productive abilities. Sabot and Knight (1990) presented a detailed and plausible critique of both credentialism and screening in the developing country context. Weiss (1995) reviewed the credentialism, screening, and human capital debate in the developed country context and conceded that the productivity-enhancing effects of literacy are likely to be a powerful influence. However, he still assigned some role to sorting effects, noting that this does not undermine the case for education investments, since social reasons for education investment are also important. Glewwe (2002) also noted that Card (1999), in the *Handbook of Labor Economics,* accepted the human capital interpretation as being dominant and does not mention even credentialism or screening. Based upon survey research, most researchers now lean toward the human capital and productivity interpretation of cognitive skills in the earnings function.(see Annex A for more details)

2.14   Another and even more ambitious attempt to use rate of return analysis for education policy purposes has been the series of worldwide compilations made by Psacharopoulos et al. since the 1970s (1973, 1980, 1985, 1994, 2002). The latest update in the series uses studies done in 98 countries employing data sets from different years (see Psacharopoulos and Patrinos 2002). All of the studies use some variant of the above specification to estimate the benefits of education. The authors present a number of tabulations, such as the one below, that confirm the classic pattern of declining rates of return to primary education as the level of development rises. (see Annex A for some details about the debate over these compilations).

2.15   It is generally accepted in the literature on public economics of investment (education and other sectors) that there would be a case for public investment if an activity or area shows a greater social rate of return than the private rate of return. If the private rate of return is greater, then that activity could be left up to individual private investors (unless credit market constraints are widespead). Table 1 examines the private and social rates of rates of return to completed primary education see para 2.2 and Annex A for social versus private calculations of rates of return.

Table 1: Social Versus Private Rates of Return for Primary Education

Region	Social Return	Private Return	Ratio Private/ Social
Asia	16.2	20.0	1.23
MENA	15.6	13.8	0.88
LAC	17.4	26.6	1.53
SSA	25.4	37.6	1.48
OECD	8.5	13.4	1.57
World	18.9	26.6	1.41

Source: Extracted from Psacharopoulos and Patrinos (2002).

2.16   It would be unwise to give too much precision to these estimates, but the apparent pattern of private rates exceeding public ones (by roughly 40 percent) calls for further examination. If these results are valid and the public investment rationale set out above applied, the case for public support of primary education would be weak, even in OECD countries that can afford it. However, the estimated social rates of return to education shown in the Table 1 are based upon earnings functions. This means that they could be underestimates if they miss the positive externalities that are often posited based upon theoretical considerations (see para. 2.10 and the next section for a review of recent efforts to estimate these externalities by macroeconomic measures).

2.17   The literature accepts the view that social costs are measured more accurately than social benefits when using the earnings function approach for social rates of return (see Psacharopoulos and Patrinos 2002). The data from private and government education spending is usually (though far from always) available and appropriate, even though it may take researchers some effort to assemble it. On the social benefit side, the positive economic externalities, that is, benefits that accrue to society at large in addition to the individual receiving benefits, are not detected in the earnings functions. Thus, social rates of return based only on individual earnings data would turn out to be less than full or true social rates of return to education. Before turning to the evidence for the existence of such externalities for primary education in developing countries, there are other critiques of private and social rate of return calculations that must be mentioned.

2.18   Bennell (1996) reviewed studies used to compile the rates of returns in Africa and has formulated a number of criticisms of based upon the quality of that data (see Annex A).[4] Concerning the public economics rationale for primary education, he points out that the earnings function data is based upon employment in the formal wage sector. In Africa, wage employment involves only a small proportion of the labor force in most countries where a majority of primary school graduates will still work in agriculture. A

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4. A somewhat different critique, which is not based upon deficiencies in the underlying data, is that supply-demand conditions in the labor markets can change the relative scarcity of skills. Basing investments on current and past patterns is a risky task. This is especially true in that the costs of investment, private or public, are usually incurred up front while the estimated benefits of increased earnings are spread out further over future periods.

similar observation could be made for low-income countries in other regions. This raises the important question as to whether primary education can increase productivity in rural settings, particularly in agriculture.

2.19   A growing number of studies suggests that primary education can enhance the productivity of farmers in developing countries. The most comprehensive of these is that of Jamison and Lau (1982), who reviewed previous work on education and agriculture and analyzed a large data set from Thailand. Although done over 20 years ago, its rigorous methods — farm-level production functions, and its clear message — primary education has positive effects on agricultural productivity, keep it relevant to today's discussion. More recently, Alderman et al. (1996) conducted a survey in rural labor markets in Pakistan, using the Ravens Matrices as a test of ability, as was done in the earnings functions research reviewed by Glewwe. They found support for the productivity enhancing role of primary education in this rural setting of Pakistan. Foster and Rosenzweig (1996) obtained results in India showing that the returns to primary schooling increased during the period of rapid technical progress called the "green revolution." In one of the most studied green revolution regions of Pakistan and India, the Punjab, Murgai et al. (2001) found that increased schooling improved the productivity of farmers as well as helping them acquire knowledge about preventing resource degradation (an emerging green revolution down side).

2.20   There are also recent studies in Latin America and Africa. In Mexico, Singh and Santiago (1997) found that rural incomes were positively affected by both the education of the farmer and of his wife. A study in Uganda by Appleton and Balihuta (1996) suggests that primary schooling of farmers *and that of neighboring farm workers* can raise crop production, suggesting an important externality. The relationship between farmer education and productivity can be complex, however, as shown by Joliffe (1998), who used the household survey data from Ghana. In his findings, primary education did not raise farm productivity, but did increase household income from non-agricultural employment. Joliffe hypothesizes that because agriculture in Ghana is still so traditional (technologically unadvanced) the benefits of basic education cannot be realized.

2.21   A major review of education and agricultural productivity in both developed and developing countries by Huffman (2001) confirms this last point. He finds ample empirical evidence in developing countries of increasing returns to education as countries proceed from traditional to modern agriculture. This is similar to the position taken by others (King and Palmer, forthcoming) that in order for basic education to create its full benefits it must be accompanied by various enabling or "critical systems" (including existence of agricultural extension workers, improved technology, and rural credit systems).

2.22   Low access to credit is a problem for the poor in many ways. Perhaps most relevant here is a poor family's inability to borrow to cover educational costs, creating a financial barrier to educational attainment. There are, in the extreme, two policy responses to this: (1) fix the credit market by making borrowing affordable, which would be first best if only credit market constraint was the problem or (2) eliminate or substantially reduce fees for primary education. Interestingly, option (1) has been chosen mainly for higher education in some countries, but no country has tried this for primary education. The literature generally promotes the belief in social externality benefits of primary education and does not address

fixing credit markets as a way to finance access for the poor. Governments almost always choose the option (2) because of the strong belief in externalities and private returns relative to social are not as high for primary education as it is for higher levels of education. The 2004 World Development Report gives a striking example of the power of a policy of lifting financial barriers: in Uganda the dropping of school fees resulted in huge increases in primary school enrollment among the poor. Similar episodes in Kenya, Malawi, and elsewhere where demand for education is high, confirms the potential power of credit market intervention on behalf of the poor.

2.23   Four main conclusions can be drawn from the literature on education, earnings, and productivity in support of strong public investment in primary education. First, the human capital interpretation of the education-earnings relationship as reflecting the productivity enhancing effect of education — more particularly the acquisition of basic cognitive skills — receives strong empirical support. Second, there is evidence that primary education enhances agricultural productivity, especially under conditions of technological and institutional innovation. Third, the true social rates of return to primary education are not fully captured by analyses of individual earnings; they need to take into account possible, unmeasured externalities. Finally, given strong evidence of credit market constraints for the poor, there is an economic rationale for public subsidies to the poor for primary education. The question of whether public subsidies should be for all or just for the poor in part hinges on the strength of externalities to education. However, most researchers and policymakers today believe it is inappropriate to apply cost recovery strategies to primary education, and no developed, industrialized country achieved UPE in that way (see Annex B on Universal Primary Education in a Historical Context). Nevertheless, most developing countries have significant private education options for those who are willing and able to "purchase" better or religiously oriented education.

2.24   As noted above, the micro-economic or individual earnings function approaches are not able to show the existence of positive externalities from primary education. Hence, they cannot be used to accurately measure a true social rate of return, whether average or marginal. In recent years, there have been attempts to verify and measure the existence of these education externalities in the macroeconomic context of new theories of economic growth, a topic the paper deals with below.

Macroeconomic Evidence: Contribution of Education to Economic Growth

2.25   Much of the recent interest in education and growth resulted from the resurgence in the late 1980s of research on theories of new or endogenous economic growth. The attempt to measure externalities from education also figures prominently in this research as education is an essential theoretical component of these new growth models. The previous research on economic growth, education, and technological progress originated in the 1960s based upon Solow's growth model (1956 and 1957) and with the discovery that there was a large unexplained residual term not accounted for by growth of capital and labor. These models of growth treated education and technological progress as exogenous to the model, that is, not determined by solving equations within the model but rather given as external data input to the model. It was not that economists really believed that education and technological progress were exogenous (Solow 1994), but

that they had not yet figured out how to formulate a mathematical model of growth with endogenous technological progress.

2.26   That changed in the late 1980s when Romer (1986) and Lucas (1988) developed models that integrated technological progress, education, and research as endogenous variables in the macroeconomic growth equations. Azariadis and Drazen (1990) formulated such a growth model that incorporated the idea of education externalities, with a threshold of about 6 years of schooling for the labor force as necessary for sustaining modern economic growth. An excellent review of this research is found in a special issue of the *World Bank Economic Review* (2001). Easterly and Levine (2001) provide one of the best summaries of this literature, with comments by Robert Solow (2001) and Paul Romer (2001). Easterly and Levine presented a set of stylized facts about growth of per capita GDP, which all point to the conclusion that the accumulation of factors of production (physical and human capital) leave a great deal of economic growth unexplained, even after adjustments for quality of the labor force. In a later book, Easterly (2001) presents an eloquent summary of this debate about economic growth and accumulation of factors of production.

2.27   The issues involved in this debate can be outlined in terms of the most general type of aggregate production function (with a slight change of notation) as used by Solow (2001) in his comments at the World Bank.

Equation 2:

$$Y = F(K, L, H; T)$$

Where: Y = GDP,
            K = physical capital,
            L = labor inputs (not adjusted for quality or human capital),
            H = human capital (most often measured by education levels), and
            T = total factor productivity (TFP) or the residual after taking into account the above factors, often attributed in large part to technology.

2.28   In mathematical models of growth prior to Solow, such as the Harrod-Domar model formulated around the time of World War II, the formal production function only incorporated K in the form of physical capital stock. Growth in this model was mainly due to the accumulation of capital and the impact of the incremental capital-output ratio (ICOR). Solow, in his 1956 growth model, incorporated labor with capital-labor substitution, but did not formally introduce endogenous human capital and technology, although he was clearly aware of their important roles. The Romer (1986) and Lucas (1988) models explicitly include human capital and also a portion of technological progress in the mathematical production function as variables endogenous to their models. With this formulation, economists now think of the sources of growth as coming from factor accumulation (physical and human capital) and total factor productivity, which represents a complex mix of technological progress, management efficiency and innovations, the policy and institutional environment.

2.29   Attempts to measure the contribution of human capital, as embodied in education, to economic growth have often been disappointing, as exemplified by a study by Pritchett (2001). After constructing measures of educational attainment of the labor force for many countries and doing cross-country growth regressions of the sort that had become widespread in the literature in the 1990s, Pritchett failed to find statistical corroboration that education contributes much to economic growth. Other investigators of this connection (Harmon 2000; Venniker 2001) found some evidence for positive externalities, but none of it very strong or undisputed. Given that the microeconomics research showed a strong connection between education, earnings, and productivity, the failure to find a similar robust confirmation in the macroeconomic has led investigators to wonder "where has all the education gone?" (the subtitle of Pritchett's article).

2.30   Krueger and Lindahl (2001) tried to reconcile the micro and the macro evidence, particularly with reference to the existence of education externalities. They believe the microeconomic evidence strongly supports the human capital view of the link between education, earnings, and productivity. They suspect that a large part of the inconsistent results in macroeconomic literature and between the microeconomic and macroeconomic studies is due to measurement errors in the education variable, especially in developing countries. They also believe that certain commonly held assumptions are inconsistent with reality, such as coefficients being the same across countries and the linearity of the growth education relationship. When those two assumptions are dropped, they find that countries with the lowest level of education show a positive and statistically significant association between initial education level at the beginning of a time period and subsequent growth. They wind up inferring an inverted U-shaped relationship between education level at a given time and subsequent growth, with the peak occurring at about 7.5 years of schooling.

2.31   A somewhat different approach is taken in a large and complex study by McMahon (1999) in which he attempts to sort out the contribution of primary, secondary, and tertiary education in Africa, Asia, and Latin America for the time period 1965-1990. He used enrollment rates for primary, secondary, and tertiary as indicators of the rate of investment at these different levels of education. In the case of Africa, he finds a positive relation between the rate of investment of physical capital and that of primary and secondary enrollments lagged 20 years. Thus, there are long time lags before primary education becomes universal and can contribute strongly to growth. For Latin America and East Asia he found primary education to have a positive impact on growth but during an earlier time period when near universal enrollments were just being reached, and similar time lags. These results appear consistent with the points made by Krueger and Lindahl (2001), but need to be viewed with some caution, since parametrization of variables for them was relatively crude, creating the danger of circularity — assuming what one is trying to prove.

2.32   Returning to the issue of variable measurement, the mainstream of human capital researchers conceptualized educational attainment in terms of level reached or national enrollment ratios at various levels and arrived at equivocal findings. If, however, education attainment is measured in terms of the knowledge or skills obtained, the macro-economic findings become more robust. Hanushek and Kimko (2000), in "Schooling, Labor Force Quality, and the Growth of Nations," present strong evidence in favor the contribution of education to economic growth if educational outcomes are taken into account. As outcome measures they use test scores from the Third International Mathematics and Science Study

(TIMSS) to adjust for the quality of the labor force, and find that it makes a significant difference in a country's growth record. Similarly, a recent cross-national study by Coulombe et al. (2004), using data from the International Adult Literacy Survey, found a strong relationship between the measures of literacy of the labor force and economic growth in 16 OECD countries (soon to be extended to developing countries).

2.33   Such findings are strikingly similar to those emerging from the micro-economic research of investigators like Glewwe (2002), that show high returns to the attainment of basic skills from primary education and not simply from having spent years in school. With the increased availability of learning outcome measures in developing countries, this suggests the most promising direction for future macro-economic research on education and growth. Yet, even if there were no positive externalities to investing in primary education, there are other reasons for investing in it.

Distribution Effects: Reducing Poverty and Inequality

2.34   Another major rationale for public investment in primary education has to do with the reduction of poverty and inequality. Goldin, Rogers, and Stern (2002) summarized what has been learned about economic growth and poverty reduction in their research paper prepared for the U.N. International Conference for Financing Development in Monterrey, Mexico. They cite economic research showing that countries that have grown fastest have also achieved the most poverty reduction, while those that stagnated economically experienced the greatest growth in poverty. However, economic growth is all the more powerful in reducing poverty when coupled with good policies for human capital development, which promote more equal income distribution. From a policy perspective, this means placing more stress on investments in people through providing access to education, health, social protection, and more direct participation in decisions affecting them.

2.35   The strong link between education and earnings, especially based upon the productivity interpretation, gave credence to the belief that primary education especially could play a powerful role in poverty alleviation. Birdsall, Ross, and Sabot (1995) studied how education actually helped in decreasing inequality in East Asia while still contributing to economic growth. They argued that a virtuous circle can be established in which policies such as promoting high-quality basic education contribute to growth and reduced inequality, which in turn stimulate more growth allowing for more education. They used cross-country regression evidence from East Asia and other regions to make their point that high-quality basic education contributed to growth both directly through the production function and labor demand, but also indirectly via reduced inequality.

2.36   The Knight and Sabot (1990) work in East Africa also confirmed this possibility, pointing out how income distribution is affected by educational expansion, with rapid expansion of basic education helping to reduce inequality. In both the East African and East Asian work, Sabot and associates argued that the well known Kuznets curve of rising inequality in the early stages of rapid economic development need not apply to all situations. Rapid education expansion under the right conditions can lead to rapid economic growth and less inequality than would be implied by the Kuznets curve. If expansion would proceed to the point of achieving UPE, then all primary age children

would then receive the "option" value of primary education (the value of the chance to compete for places higher up in the education system). At least chances for secondary and higher education would be more expanded.

2.37   Besley and Burgess (2003) reviewed the prospects of reducing poverty by half as part of the Millennium Development Goals, and concluded that human capital development is an essential part of a successful strategy to achieve this. However, they cautioned that the mechanism for expanding education is important. They cited the need to pay attention to the market conditions under which education is provided and the incentives faced by different providers.

2.38   In connection with poverty reduction and equity arguments, there are broader social outcomes of publicly subsidized primary education that would have a positive impact on the welfare of the poor. This goes beyond individual benefits and into the realm of positive public health and other societal benefits. Since the 1970s and early 1980s there has been a large literature on education and health, especially on the impact of primary education. The World Development Report (1984), which focused on the theme of Population Change and Development, covered much of this earlier literature concerning the impact of education on lowering fertility and improving maternal health. Behrman (1990), in a review of human resources and poverty, found strong evidence for the impact of maternal years of schooling on child health. Since 1990 this literature has continued to confirm in more detailed ways the positive impact of primary education on the health of households across the generations.

2.39   Glewwe (2002) reviewed health benefits in his survey of the determinants and impact of cognitive skills from schooling. In the case of the Moroccan survey, Glewwe found positive health benefits arise in conjunction with mother's general literacy and numeracy, rather than specific health topics, which were not covered in the curriculum. Although he argued that some health topics should be included in the curriculum, mothers did make use of their general education to acquire useful health knowledge. In addition, the impact of a mother's education improved her own health through lowered fertility (Gupta and Mahy 2003), which is also associated with lower maternal and child mortality and morbidity. And finally, a mother's education has been shown to raise the probability of their own children's attending school (Knight and Sabot 1990). These points all suggest a potentially strong pattern of social benefits to the poor from universal primary education, particularly that for girls.

3.   Social and Political Arguments

Social Cohesion and Welfare

3.1   Going beyond the economics rationale, many of the arguments for the social benefits of education are reminiscent of those made by 19th century industrial country reformers during their push for UPE. Although 19th century proponents of public finance for UPE did have some economic benefits in mind, their main argument were social and political. In the United States, education reformers such as Horace Mann, stressed social

cohesion-type arguments (Bowen 1981). As immigration proceeded in the late 19th century United States, public education was increasingly seen as a way of social assimilation of these large and diverse populations. In the late 18th century under Frederick the Great, Prussia had nation building in mind, and by the early 19th century it was one of the first states to establish a public education system for all children.

3.2 Such arguments are still used today in developing countries, although formulated in a more modern style and vocabulary. Some arguments put forward the hypothesis that primary education can promote social cohesion and democratic development. This takes us of out of analytical economics into the fields of development sociology and political socialization, which brings a more integrated social science perspective. Although the evidence for these arguments is harder to gather and evaluate, it is a good thing to maintain a broader perspective on the problems of education and development.

3.3 In his book "Development as Freedom" (1999a), Sen has developed these social arguments in terms of a more modern vocabulary and analytical perspective. Based upon his scholarship in the field of welfare economics and social choice (1999b), he has argued for a broad focus on *human capabilitie*s and for the essential role of primary education in their formation. In comparing the recent development experiences of India and China, he argues that the social development of China and other East Asian economies depended as much upon positive social changes, such as improved education and literacy, as upon trade liberalization. Sen's ideas on the social aspects of development have powerfully influenced the debate over primary education's impact, partly because of his stature as a Nobel prize winner for economics, but also because he of the new social change perspectives he has brought to bear.

3.4 The idea that social cohesion can help reduce social conflicts and reduce poverty has been taken up in recent years by the World Bank, especially after it became involved in reconstruction efforts after the Balkan wars. But it should also be remembered that the Bank began its role as a bank for reconstruction after World War II. The Bank's Social Development website states: "The World Bank views conflict prevention and post-conflict reconstruction as critical to its mission of poverty reduction in the past 15 years." The real question is whether educating children about social cohesion can actually help prevent social conflict. Hallak (1999) cites two interesting examples of curriculum changes in Israel, where new textbooks attempt to promote empathy between Israelis and Palestinians, and in South Africa, where history and geography textbooks are being re-written to promote post-apartheid values. Proponents have high hopes for such interventions, but until evaluation results are in, it is unclear whether they and like measures can lead to significant social change.

Basic Human Rights and Democracy

3.5 Beyond the economic and social arguments for investing in primary education, the argument for primary education as a basic human right has been cited often in the justification for the EFA program. The EFA documents prepared at Jomtien in 1990 and Dakar in 2000 place more emphasis on the human rights rationale than upon the economic and human capital rationale. These declarations cite ethical and humanistic rationales going back to the UN Basic Declaration on Human Rights (1948) as one of the

primary bases for EFA. This approach argues that all children have a basic human right of access to primary education of adequate quality so as to acquire lasting literacy and numeracy. A series of regional conferences in the 1960s organized by UNESCO led to agreement on 1980 as the target date for UPE, based mainly upon human rights arguments (UNESCO EFA Monitoring Report 2003/04). Hallak (1999) lays out how these arguments are still relevant in an increasingly global economy.

3.6   An example of an attempt to bring evidence to bear on these social and political rationales is McMahon's (1999) book-length study of education and development, in which he tries to measure the wider social benefit of education at all levels. His conceptual framework suggests that economic growth, widespread access to primary education, and especially further access to secondary education, produces working and middle classes that can organize themselves and resist being controlled by political elites. This more democratic political process then feeds back into economic growth. His structural model is a complex simultaneous equation, one with economic, education, social, and political variables.

3.7   He finds in his regression results that secondary education (lagged 12 years) has a positive and significant impact on democratization (measured by the Freedom House Index), whereas primary education has a positive and significant impact upon political stability. Also, both primary and secondary education affect democracy positively through their positive contribution to economic growth, which in his regression results lead to greater democracy and political stability in the long run. As compelling as these conclusions seem, the reservations expressed earlier about McMahon's approach should be kept in mind, and he himself acknowledges in the end that these conclusions are very tentative. This is a field of study in which it is very difficult to verify claims, however plausible or philosophically appealing, by empirical research.

3.8   Nonetheless, these ethical and human rights arguments no doubt provide part of the sense of urgency the development community feels concerning the achievement of EFA goals. While admittedly going beyond the usual boundaries of economic analysis as conventionally conceived, these arguments are well articulated and have widespread acceptance, particularly at the national level. In the end, the political momentum may well carry more weight with political parties, candidates for electoral office, populist governments, and nongovernment organizations. However, the human rights rationale for EFA must still confront real financial constraints and the hard realities of allocating scarce resources from very constrained national budgets that have to accommodate many other basic needs of the poor.

4.   Conditions of Realizing EFA Benefits

4.1   The evidence reviewed thus far indicates that the benefits of UPE, and even further education, do not automatically fall into place. While it is true that no country has achieved and sustained modern growth and development under conditions of mass illiteracy and absence of widespread primary schooling, there are cases where countries have made large human capital investments and not reaped the benefits. In the case of the

Soviet Union and Eastern Europe, Kornai (2000) makes the point that these socialist countries were less effective at using their human and physical capital. He argues that they ultimately lost the race for higher productivity with the OECD market economies despite many achievements in education at all levels. (Another interpretation of this data could be that socialist countries with firmer government control of resources are more able to provide some basic needs at much lower levels of per capita income, such as some parts of the former Soviet Union or Cuba, while at the same time paying a heavy price in other areas of their economic development.) Thus, the benefits of UPE are not automatic or universal, but are applicable only under certain conditions within the education sector, in the labor market, and also in the wider economy.

4.2   Another significant, almost obvious, condition of realizing the benefits of EFA is that students actually learn enough in primary school to complete the cycle with real literacy and numeracy. The most important conclusion from the microeconomics literature on education and earnings is that it is the cognitive skills acquired in school that lead to higher productivity and other external benefits, such as improved health, and not the level or years of education completed. Similar findings are appearing in the macro literature. Moreover, studies of schools that consistently produce cognitive skills for their pupils reveal that they are schools with good management, even if they did not have an overly generous resource base. Such good management across the whole school system is not easy to achieve, and many countries show that enrollment rates can increase without the benefits of adequate achievement. The World Bank's education policy papers (1990 and 1999) have been emphasizing this message of quality and that learning outcomes are crucial in education for more than a decade now, and the Bank and others have accumulated some experience on how to achieve this. How much this emphasis has been incorporated into the Bank's operational portfolio is one of the subjects of the ongoing Primary Education Evaluation by OED. It is essential for EFA that these management and governance experiences of how to improve learning outcomes be incorporated into each country's plan for achieving EFA.

4.3   The experience of the high-performance East Asian economies indicates that labor market flexibility is also a condition for reaping the benefits from more schooling and cognitive skills of the labor force. The Sabot and Knight comparison from Kenya indicated that greater cognitive skills were rewarded in the urban Nairobi labor market more so than in urban Dar es Salaam, where the socialist policies of Tanzania at the time afforded less labor market flexibility. Also, countries need to reach a proper balance between the public and private sectors in the labor market to avoid wage distortions that can lead to inefficient allocation of human resources. African countries have often been relatively ineffective at this, whereas those in East Asia have done better (Birdsall, Ross, and Sabot 1995).

4.4   For returns to primary education to be high in agricultural economies, it appears that school leavers must at least have access to improved technologies (Joliffe 1998). Rosenzweig (1995) formulated a model and cited some empirical findings, such as the longitudinal farm studies in India in the 1970s and 1980s, that also suggest that the returns to schooling are high when the returns to learning are high. This is an important issue for low-income countries in Sub-Saharan Africa and South Asia, where most of the

primary school graduates of a successful EFA initiative would wind up in agriculture and self-employment as opposed to modern sector wage employment.

4.5   Providing the necessary macroeconomic environment for growth is essential for reaping the returns on investment in basic education. The paper by Goldin et al. (2002) cited above discusses how this is essential for building a good investment climate. In many ways, the high-performing Asian economies followed the most important elements of the lessons highlighted in the Goldin et al. (2002) paper and the lessons there could be usefully examined by other countries to see if they can apply (see Birdsall, Ross, and Sabot 1995). The existence of an enabling institutional environment could also be a crucial factor in supporting high returns to basic education. King and Palmer (forthcoming) are examining the role of "critical systems" in assuring that EFA delivers its full benefits in a sustainable manner. Such systems would include social services (health systems, agricultural extension, etc.), systems for generating and using knowledge (including scientific and technological knowledge), and an enabling environment that supports an enterprise culture (related to the macro-economic climate variables just mentioned).

5.   Education for All Versus Alternative Education Strategies?

5.1   It is interesting that there do not appear to be any serious analytical challenges to the EFA goals in the mainstream economics and education literature. Although some people have expressed skepticism about the realism of the EFA goals and believe that many countries may not meet them, they do not question the basic soundness of the goals compared to some other set of potential goals or strategies. Some, especially some African ministers of education, have also expressed the need to be careful so as to avoid neglecting secondary and tertiary education needs as the priority is being placed upon achieving EFA. However, there appear to be no real dissenters in terms of the essential economic or social validity of the goals.

5.2   Some economists, such as Easterly (2001), would regard setting a target date such as the year 2015 as an example of establishing "administrative targets for enrollment rates," the clear implication being that this may not be efficient or optimal. His view is that "despite all the lofty sentiments about education, the return to the educational explosion of the last four decades has been disappointing." Still, under the right circumstances, which involve proper incentives for people to use their skills (not the same as formal schooling in his view), Easterly would view education as a good investment. Pritchett, whose articles on education and growth could be viewed as skeptical, is also supportive of primary education as a basic human right, although he has not explicitly argued in terms of a target year such as 2015.

5.3   There appear to be no well articulated alternative proposals in the literature that provide a clear and analytically testable formulation. For example, would it be optimal for many of the poorest countries to aim for a later date, such as 2030, for attaining EFA (including improved learning outcomes) and devote more resources to ensuring quality of primary education as EFA is being pursued, more resources should be devoted to

ensuring quality of primary education as EFA expands. More resources could also be devoted to expanding and improving complementary parts of secondary and tertiary education beyond what is needed to achieve EFA. But how can it be determined whether 2015 or 2030 is the optimal target year?

5.4   In some ways the balanced educational development proposed by the Bank Education Policy Paper (1999) might be interpreted by as an alternative model. The policy paper explicitly supports EFA, though without reference to a specific date, since it was clear at the time that the year 2000 goal would not be met, and the year 2015 goal was not accepted until the Dakar (2000) conference. From a practical point of view, balanced education development may well mean moving the target year for EFA much farther out for some countries. The policy paper avoids the need to confront this prospect since it did not go beyond general strategic principles to propose criteria and benchmarks to guide this balanced approach. The Bruns and Mingat (2002) research attempts to fill that gap by developing indicative benchmarks as a starting point for EFA analysis in individual countries. Their indicative benchmarks would support policies of maintaining high investment levels in primary education. Their starting point is the goal of achieving universal primary completion rates[5] by 2015, analyzing what is needed for that, and then leaving a reasonable residual of resources for the other levels of education. But would those indicative benchmarks really optimize the contribution of education to economic growth and income distribution over the next few decades, especially when it is improved learning outcomes and not increased years of formal education that make a difference?

5.5   Based upon the above, there would appear to be two alternative strategies (at least in the extreme): (a) a "big bang" expansion of primary education characterized by rapid expansion of access followed by gradual quality improvements that raise the average and improve the distribution of skill acquisition; and (b) improved skill acquisition of those already enrolled in primary education and gradual expansion of good quality primary schools to the entire population. There is already evidence from Uganda and Kenya that learning outcomes declined as a result of the dramatic rise in gross and net enrollment rates (Association of Universities and Colleges of Canada, et al. 2003) Uganda is now aggressively addressing this by, among other things, setting up a quality assurance unit in its MOE. Going further back in history, there is the case of Tanzania in the 1970s attempting UPE and actually getting close in terms of enrollment rates. However, it could not be sustained given the poorly performing Tanzanian economy, and a series of Bank projects in the 1990s and current decade has been needed to rehabilitate and restore quality to the primary education sector. A current Bank project in that country is an attempt to have a big bang and quality improvement at the same time.

5.6   The critical question is what is the evidence from the literature, economic or otherwise, that would shed light on these two alternative scenarios? What would be the best sequencing for those countries with both low enrollments and basic skills

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5. Bruns and Mingat argue that Universal Primary Completion (UPC) rates should be the proper goal of EFA, not Net Enrollment Rates (NER) as set out in the Dakar (2000) and MDGs. Their simulation work is based upon this. If standards of learning are maintained, and if literacy and numeracy are achieved by completion of primary school, this makes sense. But studies, such as the OED Ghana study by White (2004), showed that this is not always the case.

acquisition? Unfortunately, the literature does not offer detailed evidence, but it is worthwhile to consider the recent emphasis on the importance of cognitive skills as opposed to years of schooling. Sabot and Knight (1990) showed how primary school graduates with better cognitive skills measures do better in the labor market than secondary school graduates with less cognitive skills. The recent results from the macroeconomic research (see Hanushek and Kimko 2000 and Coulombe 2004) showed that cognitive achievement matter more for economic growth than average years of schooling. This would suggest caution about any strategy that runs the risk of failing to achieve adequate learning outcomes while striving to achieve EFA or the MDGs defined mainly in terms of enrollment rates.

5.7   From that point of view, is it likely that China and India may have reaped more benefit by substantially developing their higher education sectors well before achieving UPE? This appears to have contributed to their recent good economic performance. The historical experience in Europe in the 18th and 19th century was also that higher education developed and contributed to growth well before the achievement of UPE. These are difficult questions about the optimal balance between primary and other levels and types of education and go beyond the scope of this paper. They are also difficult for education economics with its present state of the art to answer. No doubt, they will be taken up in the fall 2004 update of the Bank Education Strategy.

6.   Conclusions

6.1   This paper started by emphasizing the search in the literature for the rationale, theoretical and empirical, that supports public investments in primary education. While examining the social and political rationales, the economic rationale was given priority. It is fair to say that the belief in the economic literature that there are positive externalities accruing from primary education is widespread, and many theoretical models incorporate ways in which this can take place. However, the empirical studies in support of these models do not make a clear-cut and robust case for the existence of large primary education externalities. They may well exist, but they are proving difficult to measure and the instruments available to economists are not powerful enough to prove the case conclusively, one way or the other.

6.2   Considering first the microeconomic data from earnings and education studies, a strong empirical case has been made in the literature that increased earnings from education result from increased individual productivity that comes from education (not years of school per se, but actual literacy and numeracy). There are still dissenters to this view who rely upon screening, credentialism, and other labor market imperfections to explain the education-earnings association, but over time this dissenting view has been declining. Outside of the formal wage earning sectors in developing countries, there is credible evidence, though not as widespread as that for wage earnings, that increased primary education (again literacy and numeracy) improves the individual productivity of farmers in developing countries under conditions of new agricultural and marketing techniques. While increased individual productivity would contribute to economic growth as individuals privately invest more in primary education, that is a different matter from a

positive externality that would justify public investments. However, credit market failure that results in individuals under investing in primary education presents an economic rationale for some significant degree of public investment.

6.3   With respect to the macroeconomic evidence for primary education externalities, there is still a vigorous debate in the literature. Krueger and Lindahl (2001), in their comprehensive review, conclude that the studies with positive results typically impose unrealistic restrictions in their statistical estimations. There is also the problem of disentangling causality in the macroeconomic studies in the sense that education could cause growth but also growth can cause more education. Venniker (2001) also reviewed these studies and reached essentially the same conclusion. At this stage of the empirical research, they conclude that it is unclear whether the social returns to education exceed the private returns. However, most of these macro-economic studies have conceptualized education in terms of educational attainment (level reached or national enrollment ratios). Those investigators who have used learning outcomes as their measure of education — literacy, numeracy, science knowledge (Hanushek and Kimko 2000; Coulombe 2004) — have found robust connections between education and economic growth. Such findings are consistent with micro-economic studies linking basic skills acquisition to increased productivity and earnings.

6.4   The social and political rationales, combined with the economic argument that focuses on poverty reduction and equity impacts of primary education, appear to tip the scales in the literature in favor of support for public investments for EFA. The international development community has coalesced around the goal of EFA by 2015 in a way that did not happen after the World Conference on Education for All in Jomtien in 1990. Although efforts were made to follow up after the Jomtien conference, the intensity of the follow up after the Dakar Conference is greater. The incorporation of EFA goals into the Millennium Development Goals has also bolstered the follow-up efforts for EFA. At the country level it appears many national leaders are taking up the challenge, and some donor countries are beginning to respond, though still not nearly enough. The real challenge lies in formulating realistic financial and management strategies to achieve the EFA goal by 2015 for most countries, and to do so in a way that produces the learning outcomes needed for economic growth and the wider social benefits.

Annex A. Earnings Functions and Rates of Return to Education

1.   The literature using earnings functions for variety of policy purposes has grown to enormous proportions, and the purpose of this annex is to summarize some technical background for how earnings functions are used in estimating rates of return to education. In almost all countries it is found that the earnings streams are larger for higher levels of education. Mincer assumed that the present values should be equal for earnings streams of different levels of education. The present values for any earnings stream is simply the sum of annual earnings discounted (or reduced) by an interest rate as it goes further into the future.

2.   Since the earnings streams from higher education levels are greater on average, a larger discount factor would be needed to equalize them to a future earnings stream from a lower level of education, giving a greater rate of return to higher levels of education. He also assumed that the opportunity costs of forgone earnings are the only costs involved. Mincer went further and assumed that human capital in the way of knowledge and specific skills is accumulated via work experience, hence he experimented with adding that variable and found that the quadratic specification fit the data best. There is still debate about variables that can appropriately be included in the set Z to augment the basic Mincerean specification as it has become known. All of these assumptions together lead to the semi-log form of the earnings function given in the text (equation 1 in the text).

3.   Soon after the original work of Mincer a number of econometric issues were raised about the above specification, especially by Griliches (1977). First, instead of schooling, what is really wanted is a measure of human capital. It would be much better to have some measure of knowledge acquired from schooling. Since this is often not available, S measured in years of schooling was used. Second, using ordinary least squares regression, it is possible that omitting a variable for the innate ability of the individual might cause an upward bias in the estimated coefficient for schooling, causing the estimated schooling coefficient to overstate the returns to education. Third, measurement errors in the variables, such as years of schooling and experience, could cause bias as well. Researchers who use data sets that do not include ability and cognitive achievement from schooling will generally try to qualify their results and see if they can set a lower or upper bound on the returns to education based upon the limitations of their particular data sets and specifications.

4.   In the case of developed countries, Krueger and Lindahl (2001) provided an extensive review of the earnings function literature and find strong evidence worldwide linking education and earnings. Moreover, they believe the weight of the evidence supports the productivity interpretation of this linkage over other interpretations, such as screening or credentialism. Thus, they concur with the human capital interpretation of the earnings functions reflecting the productivity impact of education. However, most of their research involves countries that have had universal primary education for many years.

5.   The conventional pattern in which the highest rates of return are for primary education in developing countries is maintained in the updated review of rates of returns

by Psacharopoulos and Patrinos (see Table A1). The rates of return decline by level of education and development across this study, with sub-Saharan Africa and Latin American and Caribbean regions showing the largest rates of return to primary education. Asia shows rates of return at about the world average, but the Asia region is not separated into its high-performing and low-performing economies, as is often done. Psacharopolous and Patrinos conclude that latest pattern validates previous estimates and the belief that primary education in low-income countries has the highest rates of return, and argue that primary education should receive priority in education investments.

Table A1: Rates of Return to Education by Level and for Region

Region	Social			Private		
	Prim	*Sec*	*Higher*	*Prim*	*Sec*	*Higher*
Asia	16.2	11.1	11.0	20.0	15.8	18.2
MENA*	15.6	9.7	9.9	13.8	13.6	18.8
LAC	17.4	12.9	9.9	26.6	13.6	18.8
SSA	25.4	18.4	11.3	37.6	24.6	27.8
OECD	8.5	9.4	8.5	13.4	11.3	11.6
World	18.9	13.1	10.8	26.6	17.0	19.0

Source: Psacharopoulos and Patrinos (2002).
* Indicates excluding OECD countries in MENA. Thus, former socialist (non-market) economies of Eastern Europe and Central Asia are included.

6.   Both private and social rates of return are estimated from earnings data, especially from a semi-log type regression (para. 2.9 in the main text). There are a number of ways of doing this, but they all hinge upon assuming that earnings reflect productivity (at least in large part) and that earnings differentials by levels of education reflect the productivity differentials resulting from more education. On that basis, earnings differential by education can be used to calculate benefits, and cost data on education can be used to measure investment costs, resulting in a rate of return being calculated as for any other financial investment. The key distinction is that the social rate of return must take into consideration all social costs (public and private) and all social benefits (public and private).

7.   There are major disagreements in the literature about the interpretation of the above rate of return estimates. Bennell (1996) reviewed the underlying studies in Africa used by Psacharopoulos in his 1994 update of rates of return to education and concluded that shortcomings in these studies undermine the credibility of the aggregate estimates of rates of return for the African continent as a whole. Bennell reaches two main conclusions about rates of return in Africa: (1) The aggregate rates of return are flawed and cannot be used for setting education investment priorities, and (2) The conventional pattern for rates of return almost certainly does not prevail in Africa. While Bennell's points about the flaws of the underlying studies seem valid in some of the cases, it is then hard to see how he can be sure that the conventional pattern does not prevail in Africa if the underlying studies are fundamentally unreliable. Still, he points out that this does not mean education is no longer an investment priority. Indeed, the need to raise the internal and external efficiency of education implies investment in education should be

emphasized. He argues that too much emphasis has been placed on rate of return estimates and cites the shift away from this emphasis toward broader societal and individual benefits with the focus being on individual countries.

8.   Psacharopoulos in his reply (1996) to Bennell, points out that he had acknowledged quality variations in the underlying studies, but he still did not believe that this undermined the overall pattern for Africa. However, Psacharopoulos in his reply did not address many of the other specific issues raised by Bennell, such as the distinction between the declining average rates of return for new cohorts entering the labor market, implying that the marginal rate of return is lower than the average rate of return. This issue of the marginal rate of return to new labor market entrants was raised by Knight and Sabot (1990) in their study of Kenya and Tanzania.

9.   They estimated both average and marginal rates of return to education by using regression estimates based upon sample surveys of workers in the urban wage sector, including all cohorts of workers ranging from young to old. They used their data from a series of surveys in Kenya and Tanzania to explore this issue and conclude that the marginal social rate of return to primary does not exceed that for secondary. While they caution against attributing too much precision to these estimates, they thus believe the jury is still out on the argument that rate of return analysis shows that primary education expansion in Africa is by far the most socially profitable.

10.   However, Sabot and Knight point out two major caveats that have been emphasized in the literature. The first is that more recent primary school graduates in Kenya and Tanzania are entering the agricultural sector. This may raise or lower the marginal social rate of returns depending upon the impact of education on agricultural productivity. The second caveat has to do with

Table A2: Average versus Marginal Social Rates of Return in Kenya and Tanzania

Level	Kenya	Tanzania
Avg.Prim.Soc.Rate of Return	17	11
Avg.Sec.Soc.Rate of Return	13	13
Marg.Prim.Soc.Rate of Return	12	10
Marg.Sec.Soc.Rate of Return	13	12

Source. Knight and Sabot (1990), p. 275.

employment in the public sector, in which it may be more difficult to argue that wage differentials by education represent productivity differentials. They believe that all such rate of return analysis should be backed up by careful labor market analysis, especially with respect to the expected destination of new cohorts of graduates in the labor market.

11.   Glewwe (1996), based upon a nationwide household survey in Ghana, formulates a different critique of the standard estimate of rates of return due to the fact they leave out the impact of school quality. His basic point is that when rate of returns estimate exclude student ability and school quality, the results may yield a biased estimate that is lower than the actual rate of return. Based upon the Ghana household survey, which included tests of ability and cognitive achievement, Glewwe is able to estimate rates of return to investing in school quality and finds that they yield higher returns than do additional years of schooling at the current level of school quality. This finding is especially important for Africa where current levels of school quality are generally acknowledged as being very low after many years of decline.

12.   Although these studies analyzed all levels of education, perhaps the most important lesson for the role of primary education is that the earnings and productivity of primary school graduates are strongly affected by cognitive achievement after holding years of schooling constant. In many cases, because of the overlap of the cognitive achievement distributions, primary school graduates with high cognitive achievement can do better in the labor market than secondary graduates of lower cognitive achievement. The implication here for the EFA initiative is that the focus also should be on primary school completion with an adequate level of quality in terms of cognitive achievement. However, EFA does not automatically guarantee adequate cognitive achievement, which can only come from a strong management effort to keep quality in mind as implementation of EFA makes progress toward its numerical benchmarks.

13.   One major caveat to the above is that the evidence for the returns to primary education must be examined critically in the context of each country rather than relying too much upon cross-country compilations. Furthermore, in each country attempts must be made to assess the marginal social returns of primary versus that of secondary, or at least obtain reliable trends for the average social returns over time, say a decade or two. This should be undertaken with careful analysis of the labor markets in urban and rural areas to give a proper foundation for interpreting the numbers generated by rate of return calculations, and to understand the labor market implications of successfully achieving EFA by 2015.

Annex B. Universal Primary Education in Historical Context

1.   Sen (1999, p. 129) argued that Europe, North America, Japan, and East Asia benefited from the public provision and finance of widespread primary education. His position is not uncommon among economists and educators, and he argues against the idea that free markets would provide sufficient primary education. He cites the following quote from Adam Smith concerning the argument that primary education has a substantial public goods character:

> *"For a very small expence the publick can facilitate, can encourage,*
> *and can even impose upon the whole body of the people, the*
> *necessity of acquiring those most essential parts of education."*

However, only a few economic historians have tried to find evidence in support of this historical idea as opposed to simply quoting theoretical arguments to support a widely held belief.

2.   Many economists appeal to the experience of European countries during their phases of rapid growth during the 19th century as evidence for the contribution of education to economic growth. On the other hand, some economic historians argue that formal schooling did not contribute much to the first Industrial Revolution in England (Voth 2003). Maddison has probably done the most extensive work in the quantitative history of world economic growth and has attempted to couple this with attempts to estimate education levels over the past two centuries. He hazards the guess that the average schooling of adults in European countries was about 2 years around 1820, rose to 4 years around 1870 (Maddison 1982), reaching the range of 6 to 7 years by 1913. The per capita GDP was estimated to have risen from $1,232 in 1820, to $1,974 in 1870, reaching $3,473 around 1913 (using 1990 Purchasing Power Parity or P$ for short, Maddison 2000). By way of comparison in the year 2000, the per capita GDP figures for low-income countries was $1,980 (using year 2000 PPP$, World Bank Indicators 2002) and the average schooling of adults was about 4.4 years (World Bank indicators 2002).

Table B1: Education and Growth in 19th Century Europe Versus Developing Countries

Date	Years of Schooling	GDPpc (P$1990)	Growth GDPpc
Europe 19thCentury			
1820	2	$ 1,232	--
1870	4	$ 1,974	0.95 (1820-1870)
1913	6 - 7	$ 3,473	1.32 (1870-1913)
2000 (also includes high income Asia)	10	$27,770	2.3 (1980-2000)
Low-Income Countries			
2000	4.4	$1,980 (P$2000)	1.7 (1980-2000)

Source: Maddison 1982, 1987, 2000. World Development Indicators, World Bank (2002).

Note: GDPpc is given in purchasing power parity (PPP) terms as this is more appropriate for comparing standard of living, especially taking into account non-traded goods, such as local services or foods, not reflected in exchange rates. P$ indicate dollars in PPP terms. The Maddison figures use 1990 P$ and the Bank figures are 2000P$, so it is likely that the figures for 19th century Europe would be somewhat higher, but probably not by much. That remains to be calculated.

3.   Although the estimates of Maddison for 19th century Europe are debated by economic historians, in broad orders of magnitude they appear to fit the pattern of education progress and economic growth in 19th century Europe. Even if formal schooling did not contribute much to the initial industrial revolution in England, Maddison argues that it did play a role in expanding and sustaining it. Easterlin (2000) broadly accepts Maddison's work and compares education and economic progress in 19th century Europe with that of today's developing countries, concluding that progress in 19th century Europe was more gradual than in today's low-income countries. Within their framework, present day low-income countries would appear to be very roughly around the same level of GDP per capita and standard of living as Europe around 1870. It is also noticeable that low-income countries are now growing faster than the European countries did at the time they were achieving UPE. So it would appear that achieving UPE should be within the economic reach of low-income countries.

4.   However, one should be very cautious about making such comparisons. Technology and patterns of consumption in present day low-income countries are quite different than that of the late 19th century Europe. The content and methodology of education today in low-income countries is very different from 19th century Europe, reflecting much of the progress made in the field of education as a professional discipline and a social science. The modern science discoveries of the early and mid-20th century that gave rise to the technology for today's globalization did not exist in late 19th century Europe. Moreover, the European countries of the late 19th century were the dominant economic and political powers in the world, with most of today's low-income countries in the position of being their colonies.

5.   The lesson to be learned from these historical comparisons in conjunction with the results of recent cross-country regressions on economic growth is that the present day low-income countries cannot just repeat the more gradual European experience of the 19th century. Low-income countries now face a huge economic and

knowledge gap (1999b), a situation not faced by 19th century Europe. In fact, the current trend is one of divergence in growth and standards of living between high-income and low-income countries (Pritchett 1997), with the exception of China, India, and a few others. Today's low-income countries must aim for faster economic growth and more rapid education progress than took place in 19th century Europe, and even faster than that currently taking place in high-income countries.

6.   While tertiary and secondary education have an essential role to play (see the Bank's Tertiary Education Policy Paper 2002), the most cost-effective way of raising the average education level of low-income countries is to expand primary education as rapidly as possible. This would lay the foundation for more rapid secondary and tertiary education progress. While this may oversimplify a complex set of historical patterns, it does lend support to the arguments for EFA along the lines of the argument for threshold externalities of Azariadis and Drazen (1990).

7.   Still, it must be admitted that the literature on economic history does not contain strong and irrefutable evidence that primary education has sizeable positive externalities that cause otherwise more rapid economic growth. It is difficult to sort out causality and determine whether education caused growth or the reverse. Nonetheless, the belief that primary education contributes to growth in a way that justifies public investment was pervasive in the 19th century, as it is now. In addition, the 19th century proponents of UPE in Europe, North America, and Japan appeared to have stressed the social arguments even more than the public economics ones. On the other hand, it is also difficult to use arguments from economic history against UPE and EFA. Based upon this literature, most economic and education historians would feel uncomfortable denying poor countries UPE on the basis of historical arguments that primary education as a public investment did not contribute much to the rapid progress in 19th century Europe or in Japan after the Meiji Restoration in 1868.

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