The Long Walk to School:

International education goals in historical perspective

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Abstract

Raising school enrollment, like economic development in general, takes a long time. This is partly because, as a mountain of empirical evidence now shows, economic conditions and slowly-changing parental education levels determine children's school enrollment to a greater degree than education policy interventions. A succession of international meetings has nevertheless adopted a litany of utopian international goals for universal school enrollment and gender parity in education based on the idea that a correct education policy backed by sufficient cash could achieve the goals in short order. The latest of these, the Millennium Development Goals, call for universal primary schooling and full gender parity by 2015. This work quantifies how long it has taken countries rich and poor to make the transition towards high enrollments and gender parity. There are three central lessons. First, there is a remarkable uniformity of experience in the rates of enrollment increases, a reality from which which the various rounds of goals appear entirely detached. Second, many countries that have not raised enrollments fast enough to meet the goals have in fact raised enrollments extraordinarily rapidly by historical standards and deserve celebration rather than condemnation. The very few poor countries that have raised enrollment figures at the rates envisioned by the goals have done so in many cases by accepting dramatic declines in schooling quality, failing large numbers of students, or other practices that cast doubt on the sustainability or exportability of their techniques. Third, aid-supported education policies can help within limits, and their performance should be judged in the context of country-specific, historically-grounded goals. But a country's broader development strategy outside the classroom matters much more than education policy.

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"Development is long; logic, short."

—David Landes, *The Wealth and Poverty of Nations*, p. 315.

1 Introduction

Roughly once every two decades since the Second World War, an international gathering of policymakers has solemnly promised to achieve universal primary education in developing countries by about twenty years thereafter. They succeeded in that their promises spurred public action; they failed in that their stated quantitative goals were never achieved. In 2000, the largest-ever gathering of heads of state adopted a new set of goals including universal primary school completion and full gender parity in education by 2015. Like the earlier pledges, these new Millennium Development Goals for education will not be met. Many will ascribe the outcome—as others have when past deadlines came and went—to lack of funding or 'political will'. Perhaps, instead, unmet policy goals reflect the limited impact of supply interventions in education. The record of developing countries' progress on education attainment is now long and impressive. Many developing countries whose educational attainment might be judged unfavorably by the litany of development goals should be judged favorably by history.

To what degree can education policy control the outcomes pledged by education goals? Everyone recognizes that education can create positive externalities: others may benefit from the resulting human (and social) capital. But families and individuals invest in education only insofar as the private benefit from doing so exceeds the private cost. They stop investing when the cost is prohibitive, or when the benefit is insufficient. If governments are interested in increasing schooling levels for any reason—altruism, tax receipts from skilled workers, political indoctrination, populist handouts or what have you—what *can* they do to promote it? They can, and do, reduce the private cost of parents' investment in their children's education—by subsidizing demand, say, or by increasing the available supply. But even significant reductions in cost may have only limited effects on the level of investment if the private expected benefit of education remains relatively low. This private benefit depends in large part on expectations of firms' demand for skilled labor, which is hard for governments to control. In short, the demand for educated workers is limited in some measure by the pace of economic development. With limited demand, governments can lead their young people to the fountain of education, but cannot make them drink.

If educational decisions are based in part on the private returns to education, and those returns depend in any way on the educational decisions of others, then there can be poverty traps. Low levels of education beget low levels of education, and high levels beget high levels. Countries can make a transition from one group to the other provided that other factors change—private returns change as the economy changes (demand), or the government interacts with students in a different way (supply). Can we see such a transition in the data? Is there a typical transition for most developing countries? How long does it take, and to what degree can governments accelerate it?

2 Education policy is not the *main* constraint

2.1 The traditional view: Schooling causes higher income

Support for public finance of education has a venerable tradition in economics. Adam Smith (1904 [1776], V.1.182) advocated public finance of basic education, and Alfred Marshall (1920, I.IV.28) wrote that economists "with one consent" consider such spending "a true economy, and that to refuse it is both wrong and bad business from a national point of view." At the same time, they have long held that the decision to invest in education depends on its return. Smith made the parallel between education and investing in "expensive machines" (1904 [1776], I.10.9), and Jean-Baptiste Say (1855 [1803], II.VII.15) stated explicity, "Education is capital which ought to yield interest." This return obviously depends on the economic context, so for centuries there has been a dilemma: externalities justify public intervention, but the return to education and thus the proper extent of intervention—in the presence of competing demands for public money—depends on the surrounding economy. When Great Britain was relatively poor and uneducated, John Stuart Mill (1848, II.13.13) recognized these opposing forces. He wrote, "Education is not compatible with extreme poverty. ... [Educational] improvement in ... the mass of unskilled day-labourers will be difficult and tardy, unless means can be contrived of raising the entire body to a state of tolerable comfort, and maintaining them in it until a new generation grows up."

We have no shortage of arguments that schooling children produces an educated workforce and thereby increases national productivity and income. Obviously it is true that educating children eventually produces more educated adults, and many economists have suggested that this type of investment raises incomes in developing countries more than in others. This literature, typified by Colclough (1982), is large, well-known, and backed by Nobel prize-winning research (Schultz 1989).

It need not be summarized here, but studies making this point continue to emerge. For example, McMahon (1998) argues that human capital investment has caused economic growth in East Asia, and Appleton (2000) finds that a year of education is associated with a 3-14% increase in wages and productivity in Sub-Saharan Africa. Lin (2003) finds that rising education rates are positively correlated with growth in Taiwan since 1960. There are many others.

2.2 But income and parental education can cause schooling

There is also a large and growing literature suggesting that there is a complementary path of causation running in reverse: from family income to child schooling, and from adult education levels to child schooling. The idea goes back at least to Harbison and Myers (1965), who call education "both the seed and the flower of economic development," and surely earlier. Since most of these studies were designed to measure policy impact, they include includes variables representing school quality or availability, such as distance to school, as determinants of outcomes like school enrollment. While often statistically significant, they are nowhere near as economically significant as household income and parental education in explaining the variance of schooling choices in the large majority of these studies. There are micro and macro strands to this literature. It is worthwhile to review both in detail in order to appreciate the magnitude of the evidence.

Starting many years ago, micro-level country studies have shown again and again that household income and parental education are fundamental determinants of parents' schooling choices for their children. Behrman (1987) argues that World Bank studies of the 1980s overestimated the positive impact of schooling in less developed countries (LDCs) by ignoring reverse causation from income to educational attainment. Psacharopoulos and Arriagada (1989) find that household income and parental education are major determinants of schooling attainment in Brazil. Lavy (1996, Table 2) reports that household income and parental education levels explain much more of the variance in entry of young children into the primary education system in Ghana than do distance to school, school fees, or teacher education. Burney and Irfan (1995) find that after controlling for parents' income and education, the presence of a school has no significant effect on their decisions regarding enrollment of their children in Pakistan. "This suggests," they conclude, "that a solution to low literacy in the developing countries does not depend solely on an expansion in educational facilities." In Ghana, Canagarajah and Coulombe (1997) find that households with low incomes and low levels of parental education are much less likely to send their children to school rather than

employing them as child laborers, even after controlling for the (relatively weak) effects of distance to school and public schooling expenditure. Bredie and Beeharry (1998) review micro evidence from Côte d'Ivoire, Tanzania, and Madagascar and question whether school availability and quality have anywhere near the impact on changes in enrollment due to changes in incomes and employment opportunities. Filmer and Pritchett (1998) find that the effect of household wealth on primary school attainment is large and negative, though it varies greatly across countries. Binder (1999) finds that economic stagnation in Mexico in the 1980s translated directly into stagnation in the expansion of school enrollments. Holmes (1999) finds that after controlling for wage levels, the distance to a primary school does not significantly affect the years of school attainment among children in Pakistani villages.

The evidence continues to accumulate in more recent work. Siphambe (2000) finds that rates of return to education have been rising in Botswana generally, but that education is not income-equalizing—consistent with causation from development to schooling. Shapiro and Tambashe (2001) find that the major determinants of primary enrollment among children in Kinshasa are economic well-being of the household and family structure. Brown and Park (2002) find that the major determinant of whether or not rural Chinese children enrolled in primary school drop out is the poverty of their household, overshadowing the effects of education expenditures and measures of school quality. Tansel (2002) finds that the major determinants of primary school enrollment in Turkey are household income and parents' education. Edmonds (2003) finds that 80% of declines in child labor in Vietnam during the 1990s were due to increases in households' per capita expenditure. Sawada (2003) finds that negative shocks to income cause families to pull their children out of school in Pakistan. Cogneau (2003) finds that former British colonies in Africa exhibited significantly higher educational attainment in 1960 than French colonies, but that "the education differential did not give rise to either income per capita or life expectancy differentials" between the two groups in subsequent years. Filmer's (2003) systematic analysis of household data from 21 developing countries finds that while distance-to-school is often a statistically significant determinant of enrollment, the magnitude of the effect is small. Halving the distance to school in rural Chad, for example—which would certainly require large investments in infrastructure—would only increase enrollments by less than five percent; for the other 20 countries the effect is even smaller.

We intentionally do not dwell here on the reasons underlying these findings. It could be that household income signals insertion of that household into a social network that commands economic

opportunities others do not, as one example of various explanations, and it could be that parents' education makes them raise infants in a way that makes those children get more out of school. But it is not important for the present purpose *why* parental income and schooling matter, only that they *do* matter and that they are largely inaccessible to change by youth education policies in the short run. Of course, countervailing studies do exist; not all micro research agrees that household income explains more of the variance in enrollment decisions than do variables measuring access to quality-adjusted schooling services in all circumstances. Handa (2002) finds that building more schools would have a much larger impact on school enrollments in Mozambique in 1996/7 than would raising the incomes of household heads, a result perhaps to be expected in a country where a quarter century of armed conflict had brought about the destruction or abandonment of many buildings.

On the macro side, numerous studies question causation of rising income by rising education. Behrman (1987) and Schultz (1988) and more recently Ram (1999) use cross-country evidence to argue that demand for education rises with income per capita. Krueger and Lindahl (2000) argue that increases in educational attainment are indeed positively associated with economic growth, but note that in cross-country studies the direction of causation is difficult to isolate. Mankiw (1997, pp. 103-6) calls the assumption of exogenous education the "weak link" of the empirical growth literature. Bils and Klenow (2000) conclude that "the evidence favors a dominant role for the reverse channel from growth to schooling." Benhabib and Spiegel (2000) find that financial sector development positively impacts human capital investment. Consistent with causation of schooling by growth, Pritchett's (2003) authoritative review of the macro evidence concludes, "Do differences in the evolution and dynamics of schooling help explain the big facts about output growth? Largely, no."

2.3 Policy matters, but not nearly as much

Evaluations of specific education policy interventions likewise suggest that these are not the primary determinants of enrollment. De Gregorio (1996) finds that education expenditure is not a significant determinant of school enrollment in LDCs after controlling for the development of national private financial markets. Ablo and Reinikka (1998, p. 30) find that a large fraction of the finance for rising enrollments in Uganda in the early 1990s came from parental contributions despite rising budget outlays, observe that a small fraction of non-salary education budget increases actually reached schools, and conclude that "budget allocations may not matter when institutions or their

popular control are weak." The cross-country data of Papagni (2002) finds that family income affects enrollment decisions much more than public finance of education. Universal primary education has been the policy of the Pakistani government since 1955, but the fraction of its budget allocation for basic education going unspent was 50% in the 1970s and 20% in the 1990s, despite the fact that one third of primary school age children were not enrolled in 2000. This reflects a complex interaction of employer practices, societal expectations, economic forces, government policies, and so on (World Bank 1997). An experiment giving performance incentives linked to student test scores for teachers in Kenya increased students' test scores in the short run, but "[t]eacher attendance did not improve, homework assignment did not increase, and pedagogy did not change," and rather than effecting a lasting increase in education quality, "teachers focused on manipulating short-run scores" (Glewwe et al. 2003). Das et al. (2003) find that anticipated increases in public spending on education in Zambia were ineffective in increasing student test scores as it substituted one-to-one for parental schooling expenditures. Taiwan introduced compulsory junior high school in 1968, but "roughly five out of six students receiving publicly funded JHS education just after the reform would have received that schooling anyway" (Spohr 2003).

Certainly, careful studies have documented numerous instances in which directing massive capital spending to education infrastructure has improved not only school enrollment but lifetime wages—such as the work of Duflo (2001) on Indonesia. But this does not tell us the relative impact of economic conditions and schooling investments. Can we know what the impact of those investments on lifetime wages, and therefore the incentive to enroll, would have been had Indonesia not experienced relative political stability and outstanding economic performance during the 1970s and 1980s?

The evidence visited in the sections that follow strongly suggests that while country characteristics strongly affect the timing of the beginning of an ascent to high schooling rates, these characteristics have only a limited effect on the rate at which that ascent proceeds over the long term. This does not at all imply that policy *does not matter*—unquestionaly it does—but it does suggest that policy *cannot compete* with other, more important determinants of the long-term rate of change. Among those characteristics, development of the economy and slow accumulation of a stock of educated adults appear to make the most difference. Controlling for these and other country traits that change slowly or not at all in response to education policy, the impact of policy on the rate of transition to high levels of schooling is in fact difficult to discern. Chenery and Syrquin (1975) started

a large literature, continued recently by Branson et al. (1998) among many others, by pointing out that certain patterns of structural change in developing countries have been repeated over and over in very different cultural, geographic, and institutional contexts. The transition to high schooling rates appears to be yet another of these. It cannot be emphasized too strongly that this paper does *not* claim that there is a single path necessarily followed by all economic development—the view embodied by the theories of Karl Marx as well as by their capitalist-friendly but equally deterministic antithesis, Walt Rostow's "stages of economic growth". On the contrary, there has been an extraordinary diversity of approaches to education policy and of rates of change in educational attainment. All of this diversity has, however, been confined within a remarkably narrow range of experience in the transition from low to high enrollments. Ambitious education policymakers ignore this uniformity at their peril. The surprisingly rigid constraints on this transition have applied not only to today's developing countries but also to today's rich countries in the course of their long-term development.

3 Development goals: try, try again

3.1 A trail of missed targets

International meetings have declared a series of pharaonic development goals for education since World War II, about once every 20 years, each time pledging universal primary schooling in poor countries by 10 to 20 years thence (Table 1). These earnest proclamations have emerged from the belief that educational attainment is mostly supply-constrained. The ministers of education who gathered in the early 1960s to pledge universal primary education by 1980 certainly believed that reaching this goal depended mainly on their commitment and on sufficient funding. The head of UNESCO celebrated that "for the first time, educators at the highest level in their respective countries made joint proposals to the governments of a vast region; proposals definite both in quantity and quality, [to be] realized within a definite time limit" (UNESCO 1962, p. 45). Participants at the meetings lamented their "shameful complacence" and hoped their new commitment would be fueled by "endless resources unleashed by disarmament to educational development" (Guruge 1986, p.20). They felt the bite of Dwight Eisenhower's resounding "Shame on the world! Shame on its leaders!" at the 1967 International Conference on the World Crisis in Education. The chairman of that conference estimated that $15 billion would largely resolve the education crisis. The 1950s and

1960s saw multiple proposals for an "International Educational Development Fund"—later named the International Fund for Education, Science, and Culture—similar in some respects to today's proposals for an omnibus 'Education for All' Fast Track Initiative fund. After years of negotiations, the fund was never created.

Ten years on, when it became clear that the goals would not be reached, the reaction was to cite insufficient political will—justifying a new, more solemn round of goals for the year 2000—and insufficient funding. After all, "[w]here could international aid in the amount of thousands of millions of dollars over ten years be found?" (Eteki-Mboumoua 1972, p. 161). When even this new round of education goals went unmet, blame fell once again to the unwillingness of national leaders to "rethink" and "transform" traditional approaches to education, and to the unwillingness of donors to provide "substantial, long-term resources" to fund education (Torres 2000, pp. 24, 48). A separate but related succession of goals for gender parity in education, summarized in Table 2, has followed a very similar pattern.

3.2 The latest avatar

A third wave of targets, the Millennium Development Goals, followed. The largest-ever gathering of heads of state in New York City in 2000 unanimously resolved "by the year 2015 ... [t]o ensure that ... children everywhere, boys and girls alike, will be able to complete a full course of primary schooling and that girls and boys will have equal access to all levels of education" (UN doc. A/RES/55/2). Achieving these new goals is unquestioningly taken to be a matter of "getting serious" (World Bank 2002a), to be understood as a combination of "financial assistance" from donors and "political commitment" from developing-country leaders (Devarajan et al. 2002).

In spite of all the evidence that enrollment outcomes depend on much, much more than education policy and expenditures, discussion of the Millennium Development Goals for education centers almost exclusively on public finance of education as the prime determinant of raising enrollment and completion rates. Devarajan et al. (2002) take the average cost of educating a primary school student in developing countries ($111) and multiply it by the number of children not in school to get a 'cost' of meeting the second MDG ($11.4 billion). While they admit that "financial assistance is but one of the factors required to reach these goals," their prime examples of other necessary factors are "country-level policies" and "political commitment." Likewise, Mingat et al. (2002) meticulously calculate the 'cost' of achieving universal education in 33 African countries by, in essence, multiplying

the number of children to be educated by the unit cost of doing so. An equivalent approach is taken by Colclough and Al-Samarrai (2000), who likewise simply *define* the outcome of educational enrollment to be proportional to spending inputs, as if households engage in no decision process whatsoever, and proceed to calculate the cost of expanding enrollments. Delamonica et al. (2001) add their voices to the chorus of those who multiply unit costs by the number of children out of school, arriving at roughly $9 billion in additional annual spending required. This view of the world is not entirely without empirical support, such as the work of Haddad et al. (1990), who list the number one constraint to educational expansion in the lowest income countries as lack of financial resources, and Bose et al. (2003), who find that government expenditure on education is a strong determinant of growth. But it goes against the large majority of empirical findings.

We have seen these costing exercises before. Experts built complex, assiduous models of exactly how many billions in public financing for education would be necessary to meet the 'cost' of the 1960 Karachi goals (UNESCO 1966). Their projections of attainment sprung from a complex but mechanistic model whose dynamics were determined by initial stocks, assumptions on the course of demographic change and student retention, stocks and flows in the pool of trained teachers and school buildings, and other "supply-side" factors. The study predicted that gross primary enrollment in Afghanistan, Nepal and Laos would rise from 22% to 53% by 1980; in Burma, Cambodia, India, Indonesia, Iran, Mongolia, Pakistan and Vietnam it would rise from 68% to 100%; and in Ceylon, China, Korea, Malaysia, the Philippines, Singapore and Thailand it would rise from 101% to 105% (ibid., Table 19, p. 55). The additional education expenditures required for this expansion in the three groups, respectively, estimated at $35 million, $1.67 billion, and $552 million, for a regional total of $2.26 billion in additional expenditures (ibid., Table 25, pp. 66-73). Depending on whether regional growth averaged 4% or 6% during 1964-1980, this amounted to an expansion in spending on education as a percent of regional GDP from either 3.4% or 3.7% in 1964 to either 4.2% or 6.2% in 1980 (ibid., Table 26, p. 74). Inflating those figures to today's dollars, they are roughly comparable with today's estimates of the 'cost' of meeting the education goals for Asia and the rest of the world. The message has been the same for decades: if rich countries would only have the virtue to render several billion in public money each year, and nearly all children everywhere will be in school about 15 years down the road.

3.3 Why do they do it?

The view that sufficient cash plus "political will" can achieve the goals remains firmly entrenched in policy arenas like the 2000 World Education Forum in Dakar, where "it was agreed that no country seriously committed to education for all will be thwarted by a lack of resources" (UNESCO 2002, p. 20). Already, a new round of incriminations and recriminations have begun. Again, developing countries lament the lack of public finance while developed countries decry a lack of 'commitment' on the part of the developing world. While the US is channelling most of its new bilateral foreign aid to a restricted list of countries that meet criteria including "investing in people"—implying that most do not—non-governmental organizations lament the "broken promises" of funding for *Education for All* (Oxfam 2002; Global Campaign for Education 2003). All this is by now a classic tale.

Why has the international community not tired of this cycle, and instead has signed on for another round? Perhaps the least plausible explanation is that policymakers simply do not understand the determinants of education, and have simply not seen the evidence that two-way causation between education and economic development places constraints on the impact of policy interventions in the short run. A second and better explanation is that making lofty commitments is the optimal strategy for governments of rich and of poor countries when neither is accountable to the other. Rich-country governments satisfy their constituents by promising aid contingent on developing-country 'commitment', knowing that they will either be out of office when the promises are called in or they will have abundant examples of 'uncommitted' dictatorships and basketcases. Poor-country governments ask for massive aid flows in exchange for the promise of universal schooling, knowing that only a fraction of the aid is likely to arrive, which in turn provides a reliable explanation for limited or low-quality schooling. A third explanation is that neither rich nor poor country governments are interested in creating human capital at all, and use the development goal cycle to conceal their true aims from voters. These aims might include, for rich countries, rewarding ally governments with aid unlikely to be used in its entirety for schooling; for poor countries, they might include using educational structures to reward loyal elites or provide only sufficient schooling to indoctrinate youth with the basic tools of nationalism. The present investigation makes no claim whatsoever about which of these models, or another that has not been mentioned, is correct. The only point of interest for present purposes is that the cycle of development goals may have continued for decades for reasons entirely detached from the relationship of its promises and targets to the true

determinants of the past century's epochal changes in schooling rates.

3.4 Meanwhile, enrollments skyrocket

Those changes in enrollments have indeed been staggering and heartening. The sections that follow document massive increases in school enrollments among developing countries over the last few decades, a revolution that continues to occur at rates much, much faster than it occurred in what are today's rich countries during their own development process. Goals have come and gone, and failure has been repeatedly declared, just as developing countries have been moving hundreds of millions of children into the classroom at collectively unprecedented speed.

This realization should make us suspicious of the policy implications of the inevitable 'failure' of many countries to meet the latest round of goals. It should not, however, condemn the very existence of any sort of development goal. Certainly we cannot know what would have happened to enrollments in the absence of the repeated sound and fury over ambitious goals, and it could be that they helped galvanize into action a system that in their absence would have schooled fewer children worldwide. But it might rightly condemn the existence of homogeneous, contextless, universal, extraordinarily ambitious goals. How could a goal that at least has a slim possibility of being reached be less galvanizing than one that does not?

The following sections visit the evidence we have on how rapidly countries from 1865 to 2000 have been able to approach universal primary enrollment and gender parity. The results suggest that this speed is determined by forces largely exogenous to variations in policy and within limits irrelevant to the ambitious goals we have seen again and again. Extrapolating from the patterns in Tables 1 and 2, sometime in the next five years we will declare the latest education goals unreachable, lament poor countries' lack of political will and rich countries' lack of funding, and create another set of goals for 2030. Meanwhile, enrollments will continue to soar.

4 How fast can enrollments increase?

Here we do not fashion a model of human capital investment but rather inquire about the empirical implications of a model standard in the literature. Parents have their children complete primary school if the present value of the consequent lifetime wage increment exceeds the combined value of

foregone labor and of direct schooling costs.[1] That is, children complete primary school if

$$R \equiv \left(\frac{\theta}{r} - 1\right) w - c > 0, \tag{1}$$

where R is the log present value of the net return to completing primary school, w is log wages without primary schooling, c is the log of direct costs of attending primary school such as fees paid or distance traveled, θ is the increment in the value of the child's labor due to a complete primary education, and r is the return on the parents' best alternative investment.

Development goals for education are often framed in terms of fractions of the relevant population, so any model of progress toward the goals must admit heterogenous children. Suppose that w and c are independent and logistically distributed in the population of a given country.[2] That is, the returns to and costs of education are distributed across the population, for reasons of natural and nurtured ability, placement in social networks (Borjas 1995), geographical location (Bénabou 1996), or others. Assuming $w \sim \mathcal{L}(\mu_w, \sigma_w)$ and $c \sim \mathcal{L}(\mu_c, \sigma_c)$, we have $R \sim \mathcal{L}((\theta/r - 1)\mu_w - \mu_c, |(\theta/r - 1)\sigma_w - \sigma_c|) \equiv \mathcal{L}(\mu_R, \sigma_R)$. Finally, let F_R represent the cumulative distribution function of R.

An education minister seeking to induce more children to complete primary school must use policy to alter the distribution of R, by changing the timepath of μ_R or σ_R or both. Average return μ_R evolves as $\dot{\mu}_R = (\theta/r - 1)\dot{\mu}_w - \left(\theta/r^2\right)\dot{r} + (\mu_w/r)\dot{\theta} - \dot{\mu}_c$, where a superscript dot represents the derivative with respect to time. It is immediately apparent that all of these variables are at least partially beyond the control of the education minister, and some are totally beyond his or her control. Enforced restrictions on child labor or improvements in teacher training could affect $\dot{\theta}$, but so could exogenous technological change. Building schools, abolishing fees, or enforcing truancy laws could affect $\dot{\mu}_c$, but so could urbanization, improvements to transportation infrastructure, and cultural change. Finally, $\dot{\mu}_w$ and $\dot{r}$ are certainly beyond the control of the education minister. Following a very similar argument for σ_R, it is convenient to define

$$\dot{\mu}_R \equiv \dot{\bar{\mu}}_R + \dot{\hat{\mu}}_R \quad \text{and} \quad \dot{\sigma}_R \equiv \dot{\bar{\sigma}}_R + \dot{\hat{\sigma}}_R, \tag{2}$$

[1] They invest in their children's schooling according to a simple version of the standard human capital model developed in Becker (1964) and Mincer (1974) among others, based on Mincer (1958) and Schultz (1961), and surveyed in Harmon, Oosterbeek and Walker (2003).

[2] These can be thought of as normally distributed. The cumulative distribution function of the normal distribution has no closed-form solution, so it is simply more convenient to model these variables with the logistic distribution $\mathcal{L}(\mu, \sigma)$, whose small deviation from the normal is here immaterial.

where a superscript bar ($\dot{\bar{\mu}}_R, \dot{\bar{\sigma}}_R$) suggests that the variable is taken as given by an education policymaker, and a 'hat' ($\dot{\hat{\mu}}_R, \dot{\hat{\sigma}}_R$) suggests that that variable could be influenced by an education policymaker.[3]

The fraction of children meeting condition (1) and thus completing primary school is

$$s_t = 1 - F_R(0) = \left(1 + e^{-\frac{\pi}{\sqrt{3}}\frac{\mu_R}{\sigma_R}}\right)^{-1}. \tag{3}$$

It follows from (2) and (3) that the rate of change of primary completion is

$$\frac{\dot{s}_t}{s_t} = (\bar{a} + \hat{a})\,(1 - s_t)\,, \tag{4}$$

where the "transition speed" $a \equiv \bar{a} + \hat{a}$ is a measure of how quickly the country approaches universal primary education from a given starting point, letting $\bar{a} \equiv \frac{\pi}{\sqrt{3}}\frac{\mu_R}{\sigma_R}\left(\frac{\dot{\bar{\mu}}_R}{\mu_R} - \frac{\dot{\bar{\sigma}}_R}{\sigma_R}\right)$ and $\hat{a} \equiv \frac{\pi}{\sqrt{3}}\frac{\mu_R}{\sigma_R}\left(\frac{\dot{\hat{\mu}}_R}{\mu_R} - \frac{\dot{\hat{\sigma}}_R}{\sigma_R}\right)$.

A first step in determining how much education policymakers can do to move countries more quickly toward universal primary education is to decompose the variance of (4). As a first pass, how much of the variation in $\dot{s}_t/s_t$ across countries can be attributed to variation in $(1 - s_t)$, which is beyond policymakers' control, and how much to a? Second, at a finer level of detail, how much can be attributed to $\hat{a}$, the portion of the transition speed that policymakers can influence to any meaningful degree? The next section explores the first question, and the section thereafter explores the second question.

5 Assume a uniform transition speed

The Bernoulli equation (4) yields $s_t = \left(1 + e^{-a(t-b)}\right)^{-1}$, the S-shaped logistic growth curve developed by Belgian mathematical biologist Pierre-François Verhulst (1838). The shape of the curve reflects the diminishing speed of later increases in attainment, called "ceiling effects" by Meyer et al. (1992) and dubbed the "global education transition" by Wils (2003) and Wils and O'Connor (2003a) . Assuming for the moment that there is a transition speed a typical of all countries, for country i we

[3] Where $\dot{\bar{\mu}}_R \equiv (\theta/r - 1)\,\dot{\mu}_w - (\theta/r^2)\,\dot{r}$ and $\dot{\hat{\mu}}_R \equiv (\mu_w/r)\,\dot{\theta} - \dot{\mu}_c$. Likewise $\dot{\bar{\sigma}}_R \equiv \pm\left((\theta/r - 1)\,\dot{\sigma}_w - (\theta/r^2)\,\dot{r}\right)$ and $\dot{\hat{\sigma}}_R \equiv \pm\left((\mu_w/r)\,\dot{\theta} - \dot{\sigma}_c\right)$, where the signs depend on whether or not $(\theta/r - 1)\,\sigma_w - \sigma_c > 0$.

have

$$-\ln\left(\frac{1}{s_{i,t}}-1\right)=at-ab_i. \tag{5}$$

5.1 The typical transition speed, 1960-2000

Table 3 summarizes the variables in the database. Table 4 presents the results of regressions based on equation (5), using net primary enrollment as s. The analysis includes only those countries for which at least two observations over time are available.

The analysis demands that we account in some way for countries that report net enrollment over 100%—a measurement error arising from inappropriate counting of children held back or from the fact that it is easier to count children in school in than children in the whole population by age group. In equation (5), those observations are censored since the logarithm of a negative number is undefined. We can either ignore this issue, as in column (1) of Table 3, analyze only those countries that never report $s > 100\%$ as in column (2), or use nonlinear regression to estimate is $s_t = \left(1+e^{-a(t-b)}\right)^{-1}$ directly.[4] The confidence intervals for the various estimates of a overlap at about 0.04.

Two features stand out from Table 4. The first is that given the year b_i in which each country achieved 50% enrollment, and a single transition speed $a \approx 0.04$ typical of the world as a whole, we can predict roughly 90% of the variation in net primary enrollment in all countries for the entire postwar period. Each country has its own circumstance, but it is nevertheless meaningful to speak of "the" education transition.[5] This does not suggest that there is one path that all must take, but that there is a remarkably homogenous set of paths that most have taken.

The second is that the typical transition occurs at a measured pace. Figure 1 shows the typical transition as a solid line compared to actual net primary enrollment data. "Adjusted year" is the difference between the year of the quinquennial datapoints and the estimate $\hat{b}_i$ from (5). The figure thus reveals how the transition might look if every country had reached 50% enrollment in the same year. If that were the case, then in the postwar 20th century the typical country—rich or poor—would have risen to 70% after 22.3 years, 80% after 36.4 years, and 90% after 57.7 years.[6]

[4] The nonlinear regression constrains $b_i \geq 1750$ and omits outliers BLR 2000 and PLW 2000. The results are not sensitive to either of these restrictions.

[5] Simon and Boggs (1997) document pictorially that despite wide international variation in primary education expenditures per student, the rate of transition from low to high enrollments has been remarkably uniform across a wide variety of countries.

[6] Wils and O'Connor (2003a), who use a much more limited dataset and proxy enrollment with literacy acquisition, find that the typical country in this period took 35-80 years to make a hypothetical transition from 10% net primary

5.2 The typical transiton speed before 1914

While this may seem slow, it is in fact an unprecedented achievement. In the late 19th and early 20th centuries, when today's rich countries had levels of school enrollment more comparable to those seen in today's poorer countries, they took significantly longer to undergo the same transition. Table 5 presents regressions based on (5), both for all 35 countries[7] on which we have data and for the 16 countries among them that are today the most developed.[8]

The dependent variable in Table 5 is *not* net primary enrollment because surviving statistics for most of these countries do not allow its calculation. Rather, it is the number of people of any age enrolled in primary school divided by the size of the population under the age of 15, analogous to but not precisely equal to gross enrollment (the denominator includes infants). Since the highest level of this statistic in any of these countries was approximately 60% during the entire period 1865-2000, 60% was chosen as the presumed maximum value for the linear analysis of columns 1 and 2. The material results are not sensitive to this assumption, as revealed when the assumption is relaxed by the nonlinear analysis of columns 3 and 4. Figure 2 shows the typical transition for all 35 countries before 1914. The S-shaped pathway for educational expansion in this period, first reported by Meyer et al. (1992), is evident.

Again, the regressand is not the same in Tables 4 and 5, so the results are not comparable in the narrowest sense. But the units of the transition speed are percent of the maximum value per year; it measures how long these countries typically took to get from low levels of enrollment to high levels. Table 4 implies that the typical country after 1960 took about 28 years to get from 75% of the worldwide maximum level of that enrollment statistic to 90% of the maximum. Table 5 reveals that before 1914 it took about 41 years to get from 75% of the worldwide maximum value of net primary enrollment to 90% of the maximum. These results would be incomparable to the extent that the demographic structure of the countries in question was rapidly changing at the time—rapid increases in population growth would inflate the denominator of the regressand in Table 5 and

enrollment to 90%—much more rapidly than the 115 years implied by the figures here. The two results are not comparable for many reasons. Among these are that literacy figures are often compiled by census takers who simply ask whether or not the respondent is literate and are therefore a poor proxy for school completion, and are furthermore undesirable for the present purposes because development goals are not stated in literacy terms.

[7] Argentina, Australia, Austria-Hungary (now Austria and Hungary), Brazil, Canada, Ceylon (now Sri Lanka), Chile, China, Colombia, Cuba, Denmark, Egypt, France, Germany, Greece, India, Netherlands Indies (now Indonesia), Italy, Japan, Mexico, Burma (now Myanmar), New Zealand, Norway, Peru, Philippines, Portugal, Russia, Serbia (now Serbia and Montenegro), Spain, Sweden, Siam (now Thailand), Anatolian portion of Ottoman Empire (now Turkey), United Kingdom, United States, Uruguay. The nonlinear analysis constrains Constrains $b_i \geq 1650$.

[8] Australia, Austria-Hungary, Canada, Denmark, France, Germany, Greece, Italy, Japan, New Zealand, Norway, Portugal, Spain, Sweden, United Kingdom, United States.

depress the estimated coefficient on year—but it was not. Aside from New Zealand and Ceylon, the rate of population growth was not changing fast enough in these countries at this time for a panel regression of population growth on time to yield a statistically significant coefficient (results not reported).

6 Allow heterogeneous transition speed

While it is thus reasonable to speak of a typical transition speed, it is of course not true that all countries have the same transition speed. Modifying equation (5) to allow for a random coefficient a_i and employing the estimator of Hildreth and Houck (1968) allows calculation of the χ^2-distributed Swamy (1970) statistic, which Johnston (1984) has shown is equivalent to testing the null hypothesis that $a_i = a \; \forall \; i$. In the case of the first column of Table 4, $\chi^2_{190} = 9,230$ and the null is rejected at $p < 1\%$. Cross-country heterogeneity of a is statistically signficant during 1960-2000.

We now relax the assumption that all countries have the same transition speed. Let each country have an idiosyncratic transition speed $a_i = Z_i'\Gamma + v$, where $Z_i = (z_{i,1}, ..., z_{i,n})'$ is a vector of known characteristics of country i exogenous to the transition speed, $\Gamma = (\gamma_1, ..., \gamma_n)'$ is an unknown vector of coefficients common to all countries, and v is some unknown constant common to all countries. Together with equation (5), this implies

$$-\ln\left(\frac{1}{s_{i,t}} - 1\right) = vt + t\sum_{j=1}^{n} z_{i,j}\gamma_j + c_i, \tag{6}$$

where $c_i \equiv -a_i b_i$. Equation (6) lends itself to estimation with country fixed effects to capture c_i. The coefficient on the interaction of each country characteristic $z_{i,j}$ with the year t—the second term on the right-hand side—yields an estimate of γ_j, the degree of correlation between a marginal change in that characteristic and a change in the transition speed. Random effects, though more efficient, would give biased coefficient estimates in this case since the country effect is systematically related to the interaction term through (Z_i, Γ).

Table 6 estimates equation (6) for a set of country-characteristics Z_i measured at the year 1980. The three numbers reported for each variable are the estimated coefficient, the standard error (in round braces) and the standardized coefficient (in square braces).[9] Variables under the control

[9] The standardized coefficient is coefficient estimate if regressors and regressand are first normalized to mean zero and standard deviation one. It is represents the number of standard deviations of the dependent variable explained

of education policymakers, and thus determining $\hat{a}$, include public expenditure on education as a percent of GDP and the pupil-teacher ratio in primary education. While the coefficients on both of these variables have the expected sign, neither is statistically significant. Moreover, the standardized coefficients reveal that alongside other country characteristics, neither is economically signficant.

A brief calculation illustrates the meaning of these estimates. From Table 3, the typical country had GDP per capita at Purchasing Power Parity in 1980 of $4,380 and spent 4.0% of its GDP on public education. If we reduce that country's income to $3,060, the transition speed slows from $a = 0.0378$ (column 1) to $a = 0.0291$ (since $(30.6 - 43.8) \times 0.000658 = -0.00869$). If we then increase its public education spending to 11.3% of GDP, the highest value on record, this is just enough to bring the transition speed exactly back to 0.0378 (since $(0.113 - 0.040) \times 0.119 = +0.00869$). Even this is an optimistic assessment of the ability of education expenditures to make up the difference, because the statistical insignificance of the coefficient estimate means that we cannot be sure it is different from zero. If income falls below $3,060 (roughly the level of Paraguay or Papua New Guinea), educational expenditures would need to rise to levels higher than have ever been seen in any developed or developing country—all else equal—to keep the country at the typical transition speed.

In other words, the coefficient estimates suggest that for very poor countries, $\bar{a}$ is much more important than $\hat{a}$ in determining the transition speed. In the poorest countries, those with less than $3,060 a year in PPP income or roughly one third of the countries on earth, no reasonable amount of education expenditure can—in and of itself, and all else equal—even bring them up to the typical transition speed, much less make them vault beyond it. This does not in the slighest imply that poor countries cannot move faster than the typical transition speed (many have), but only that there is no evidence whatsoever that increased education expenditures—*per se* and all else equal—are capable of bringing this about.

It is difficult to conduct a similar exercise for the pupil-teacher ratio, since the high correlation between that ratio and GDP per capita (-0.684) means that multicollinearily may cloud the relative importance of their coefficients. The pattern revealed in the standardized coefficients is, however, clearly that the structure of the economy and the extent and distribution of adults' education have been far more highly correlated with rapid expansion of enrollment than has provision of additional

by a one standard-deviation change in each independent variable, and allows comparison of correlation magnitudes across regressors measured in different units.

teachers.

Thomas et al. (2001) estimate Gini coefficients based on educational attainment, where a value of zero indicates that the entire population has completed the same number of years of schooling and a value of one means that only one person in the country has completed any years of schooling at all. The fact that a higher education Gini index is associated with faster primary enrollment transition speeds in Table 6 might be expected for several reasons. One of these is that if the return to a marginal year of education tends to rise for each year—as Duraisamy (2002) has shown for India and Siphambe (2000) for Botswana—then communities might require the "demonstration effect" of watching a small number of their members go far enough to realize high returns before choosing to invest in the initial, low-return years. Another is that communities believe from the start that high returns can be realized at higher levels of education, but do not believe that returns are high for primary education alone, so wait until secondary schools are sufficiently available for there to be some reasonable chance of their child continuing past primary school before enrolling their children in primary. This last is suggested, though not proven, by the fact that no country today has achieved over 90% primary net enrollment without having at least roughly 35% secondary net enrollment.

There is no conflict between the observation that household income shows up in surveys as a strong determinant of enrollment decisions whereas Figure 1 suggests that many countries raised enrollments where income did not grow. In the language of equations (1) and (2), rising wages w can raise μ_R and σ_R, but so can many other forces. Technological diffusion can change r, for example, and slow changes in parents' child-rearing practices can change the benefits θ that children receive from being in school. But the speed of these changes, too, is structurally constrained.

7 The gender transition

The transition from low to high enrollments has followed different paths for girls and boys. It is therefore interesting to disaggregate the preceding analysis by gender. The variable of interest for gender equity goals in education has frequently been the ratio of female enrollment to male enrollment at a given level.

Coverage for gender-disaggregated data is more limited for net enrollment than for gross. It is therefore tempting to calculate the female-to-male ratio for gross enrollment and let this serve as a proxy for the net ratio, allowing recourse to much more extensive data. The drawback of this

approach is that the evolution of this ratio cannot be expressed exactly as a function of time and of the ratio itself; some inclusion of gender-disaggregated net enrollment data is necessary to model the timepath of the ratio exactly. There is thus a tradeoff between approximating the evolution of this ratio with better data, or measuring it exactly with worse data. Here we take both approaches.

First we use better data and an approximate functional form to model the gender transition. Let $r \equiv s^f/s^m$ represent the ratio of female net enrollment to male net enrollment. From $\dot{r}/r = \dot{s}^f/s^f - \dot{s}^m/s^m$, equation (4) gives $\dot{r}/r = a^f\left(1-s^f\right) - a^m\left(1-s^m\right)$, or

$$\frac{\dot{r}}{r} = \left(a^f - a^m\right) + a^f s^m \left(\frac{a^m}{a^f} - r\right). \tag{7}$$

When $a^f \approx a^m$, then as s^m approaches unity, (7) will resemble (4) and the growth of r will be roughly logistic. Taking the ratio of female gross enrollment to male gross enrollment as a proxy for r, we can therefore use an equation analogous to (5) to model the evolution of r. That is, $-\ln((1-r)/r)$ is approximately linear in t. Table 7 takes advantage of this fact to estimate the corresponding speed of transition to parity in the gross enrollment ratio for primary and secondary education. Figure 3 shows the typical transition for gender ratios in primary education, and reveals that the logistic curve is indeed a good approximation of the true process.

The numbers suggest, for example, that a country whose ratio of girls' gross primary enrollment to boys' is 0.8 typically takes 28 years to reach a ratio of 0.95. In secondary education, the transition from 0.8 to 0.95 has typically taken 29 years.

Now we use more limited data and an exact functional form to model the gender transition. The distributions of the parameters of enrollment condition (1) could be quite different for girls than for boys. Different labor roles in the home and different degrees of labor force participation by women could mean that w and θ are distributed differently for each gender. Sexual harassment in public spaces, among other factors, could mean that c differs by gender as well. Such differences are supported by volumnious micro research, such as Herz et al. (1991). In short, boys and girls could follow different versions of equation (4).

First, assume that the female transition speed a^f is common to all countries, as is the male transition speed a^m. Each gender would then have a separate relationship (5), estimated in Table

8. The difference of these equations is

$$-\ln\left(\frac{1/s_{i,t}^{f}-1}{1/s_{i,t}^{m}-1}\right)=\left(a^{f}-a^{m}\right)t-c_{i}^{\prime}, \tag{8}$$

where $c_i' \equiv a^f b_i^f - a^m b_i^m$ is a country-specific constant. The first and third columns of Table 9 estimate this relationship, confirming that the difference between a^f and a^m in Table 8 is indeed statistically significant. The big picture since 1950 is that girls' primary and secondary enrollments have been catching up to those of boys, that the gender gap in education is closing—supporting the results of Wils (2003), but contrary to the finding of Ahuja and Filmer (1995).

Relaxing the constraint that $\left(a^f - a^m\right)$ is identical across countries, the equation analogous to (6) is

$$-\ln\left(\frac{1/s_{i,t}^{f}-1}{1/s_{i,t}^{m}-1}\right)=\left(v^{f}-v^{m}\right)t+t\sum_{j=1}^{n}z_{i,j}\left(\gamma_{j}^{f}-\gamma_{j}^{m}\right)+c_{i}^{\prime\prime}. \tag{9}$$

where $c_i'' \equiv a_i^f b_i^f - a_i^m b_i^m$ is a country-specific constant. Estimates of the coefficient on the interaction term between t and each country characteristic $z_{i,j}$ reveal the correlation between that characteristic and the degree to which transition speed is faster for females than for males. Table 9 explores this relationship as well. The included set of country characteristics is intended to capture some aspects of women's social and economic status, repeatedly identified as major determinants of the level of girls' schooling relative to boys' (e.g. Stromquist 1989; King and Hill 1993).

The estimates suggest that populations that are *a priori* more educated have been quicker to close the gender gap, as suggested by Wils and Goujon (1998). Female labor force participation is positively but not statistically significantly correlated with faster transitions to gender parity at the primary level. The sign of this relationship is suggested e.g. by the work of King (1996) in Peru.

Higher fertility, interestingly, is associated with faster elimination of the gender gap. Perhaps families with one boy and one girl might elect to keep the daughter out of school to assist with household tasks, while a family with five boys and five girls can send four of the girls to school and get the same household labor. This is consistent with Glick and Sahn (2000), who found that having a large number of sisters increased the years of schooling for girls in Guinea, and Al-Samarrai and Peasgood (1998) who found that the number of children in the household significantly increased primary enrollment and completion rates in Tanzania, as well as the findings of Canagarajah and Coulombe (1997) in Ghana and World Bank (1997) in Pakistan.

Finally, populations with high proportions of their population professing Christian, Muslim, or indigenous/animist faith have been slower to make the transition to gender parity in primary education. All else equal, poorer countries have notably been just as effective as richer ones at closing the gender gap in education—as Filmer et al. (1998) find at the state level in India and Pakistan, Shapiro and Tambase (2001) find for households in Kinshasa, and Pal (2003) finds among households in West Bengal.

While these characteristics do not come close to explaining all of the variation in the data, they do point out that 1) worldwide girls have been slowly closing the gender gap with boys, 2) this process is relatively uniform and takes many decades, and 3) what variation there has been across countries in the speed of this 'catching up' has been correlated with many factors beyond the control of education policymakers.

8 Case studies

8.1 Many 'off track' countries are moving at blistering speed

Figure 4 shows alternative futures for net primary enrollment in Burkina Faso, a country classified as "seriously off track" in an education progress report published by the World Bank (Bruns et al. 2003, p. 180). Circles show actual data from the recent Burkinabe past. The solid line fits equation (5) to those data to approximate the current trend. The long-dashed line shows the path that would be necessary to meet the second Millennium Development Goal, a radical departure from the past several decades. The short-dashed line shows the hypothetical path Burkina Faso would follow if it were to move at the typical post-1960 transition speed measured in Table 4. Finally, the dotted line shows the path according to the typical 19th-century transition speed of today's richest countries. The transition speed parameter a for Burkina Faso is 0.058, while for the typical country after 1960 it was 0.038 and for the typical rich country in the nineteenth century, 0.027.

Burkina Faso may indeed be "seriously off track" to meet the Millennium Development Goals, but it has spent the last few decades bringing children into primary school at more than twice the rate achieved by today's rich countries when they were developing. It has also far exceeded the typical transition speed of all countries collectively, rich and poor, after 1960. It has done this with an economy far less developed than the leading economies of the 1800s and less developed than the vast majority of countries after 1960. In historical perspective, Burkina Faso is better than "on

track" for any reasonable education goal. It could only be "off track" for a goal divorced from a century and a half of experience by hundreds of millions of families and countless well-intentioned policymakers.

Table 10 documents the same information regarding a variety of the poorest countries for which we have a sufficiently long time series to comfortably fit equation (5) by individual countries. Of these, only The Gambia and Nicaragua are classified as "on track" by Bruns et al. (2003, p. 176). The reality is that none of these countries will meet the second Millennium Development Goal, but with very limited resources all of them are likely to outshine the past performance both of their peers and of today's wealthiest nations.

8.2 'Development goals' of the 19th century

This last point is underscored by Table 11, which presents a picture of the education development goals today's rich countries once set for themselves. The first column gives the year in which compulsory primary education was first legally instituted[10]—a form of national development goal since *de jure* universal education preceded *de facto* in all these cases. The next column gives GDP per capita in the year that compulsory basic schooling was instated, expressed in 1990 US$; compare these figures to the rightmost column of Table 10 (all from Maddison 2001). The next two columns show the evolution, starting in that year and over the following three decades, of the number of people enrolled in primary school divided by the population under age 15. Recalling Table 5, note that progress toward roughly 60% indicates progress toward universal primary enrollment.

It stands out starkly in this table that when today's rich countries made universal primary enrollment a national development goal, 1) they were richer than today's lowest-income countries, and 2) they either set the goal when they had nearly achieved universal enrollment, or took several decades to approach it. For example, when Massachusetts became the first state to declare compulsory primary education in 1852, the US was richer than most of the countries in Table 10 and had already reached relatively high levels of enrollment.[11] As Goldin (1999, p.8) notes for the US,

[10] 1852 is the year in which Massachusetts established compulsory basic schooling; all states in the union did not have such laws until 1918 (Goldin 1999). 1872 is the year in which Victoria colony instituted compulsory basic schooling; the rest of what is now Australia followed during 1875-1880 (Cubberly 1920, Ch. 27). Italy established three years of compulsory basic education in 1877, but "little had been accomplished in enforcing the compulsion previous to the new compulsory law of 1904" (ibid., Ch. 23). The rest of these years come from Cubberly (1920) or Godo and Hayami (2002).

[11] In 1852 income per capita in Massachusetts was roughly 35% higher than the national average shown in the table, or roughly $2,700 in 1991 dollars, which only strengthens the conclusion (Maddison [2001] adjusted by Richard A. Easterlin, [1961], "Regional income trends, 1840-1950," in Seymour Harris, ed., *American Economic History* [New

"[a]lthough compulsory education laws were also passed during the period of the common [primary] school transformation, it is believed that they lagged rather than led it. That is, the state laws were passed only after the majority of youths had already gone beyond the age of compulsion in the laws." Japan's Primary School Order (*Shogakko Rei*) of 1886 introduced compulsory education of four years[12] when income per capita was somewhat lower and schooling much less widespread, but progress toward the upper bound of roughly 62% from Table 5 was very slow—from 24% to 38% over the following three decades.

These stylized facts are not limited to the countries in the table; Jónasson (2002) finds that in Iceland since 1900, "[i]t has never been the case that laws stipulating compulsory education have preceded important changes in school attendance." Nor are they limited to primary education: Goldin and Katz (2003) find that a scant five percent of the massive increases in secondary enrollments in the United States from 1910 to 1939 can be attributed to compulsory schooling and child labor laws. The rises are instead attributable to increases in and equitable distribution of wealth and economic opportunity as well as demographic changes and social stability (Goldin and Katz 1997).

8.3 Bad news for the goals, good news for many children

What can we expect in today's developing countries over the next few decades? It is instructive to test the out-of-sample predictive power of equation (5) by fitting it to past data and comparing its predictions to actual performance. Table 12 carries out this exercise for net primary enrollment. Suppose we were sitting at the Education for All meeting in Jomtien, Thailand, in 1990. We would no longer have access to any data recorded after that year. The first column records the simple average, across countries, of net primary enrollment in each region in 1990. Suppose we were then to estimate the typical transition speed for net primary enrollment up to 1990 and use this to predict what would happen to regional enrollment levels by 2000, Jomtien's goal year for universal primary enrollment.

These predictions, shown in the second column, match quite well with actual performance since Jomtien—in the third column. All the same pledges of aid and political will were heard at Jomtien as were heard at Karachi in 1960 and at New York in 2000, but equation (5) turns out to be a

York: McGraw-Hill], pp. 525-547, Table 1). All US states had introduced compulsory primary education by 1918, when national income per capita was around $5,700 (based on Maddison 2001). The US first achieved gender parity in elementary education around 1900 (Goldin 1999).

[12] Extended to 6 years in 1907 (Godo and Hayami 2002).

far better predictor of events than the most impassioned pledges and goals. Sub-Saharan Africa, South Asia, and Latin America all beat the trend the world had been on prior to Jomtien, but this unprecedented success was naturally termed a failure. The fourth column of the table uses the same technique, this time with data through the year 2000, to predict where each region might stand in 2015.

Table 13 carries out a similar exercise for the gender ratio in primary schooling. South Asia and Middle East/North Africa missed the lofty goals of the Mexico City, Copenhagen, and Nairobi summits, but during the 1990s managed to beat the typical worldwide speed of transition to gender parity prior to 1990. Rather than malign the 'failure' of these heavily Muslim regions to get girls into school, we might justifiably celebrate their achievement.

8.4 'Best practice' or bubble?

Table 14 uses several cases to illustrate the message of the statistical tests in Table 6. The table shows sample enrollment rates to illustrate the rate of change over different periods selected for expository purposes, public expenditure on education as a percentage of GDP, public expenditure on primary schooling as a percentage of GDP per capita, and primary pupils per teacher—all averaged over the last decade of the period in question.

According to the typical speed of transition to universal primary education after 1960, a country starting at a net primary enrollment of 70% takes about 30 years to reach 90-95% enrollment. The first section of the table lists several countries that followed roughly this portion of the transition curve in the years leading up to 2000, at roughly the typical transition speed or a bit faster. Did all or most of them spend more than average on education? No. Did all of them have markedly more teachers per student than average? No, again.

The next section of the table gives examples of countries that experienced a notable stagnation of enrollment rates—such as Venezuela—or a major decline in enrollment over several years. While one might say that expenditure on primary education as a fraction of GDP per capita was lower than average in all of these, they also have high GDP per capita compared to many LDCs. Their total education expenditure and pupil-teacher ratios were not out of line with world averages. And glancing over the list, we have some idea of what happened in each country: war, political turmoil, natural resource crises, and misguided economic planning assailed the economies of the countries in question. Kenyan enrollments stagnated along with the Kenyan economy under the kleptocratic

Moi régime, and as willing as are Bedi et al. (2003) to ascribe the enrollment declines to school fees, a healthier Kenyan economy would certainly have eased the fiscal constraints that motivated those fees in the first place. As much as Julius Nyerere prattled about "education for liberation", his catastrophic *ujamaa* campaign and associated well-meaning socialist blunders helped eviscerate the Tanzanian economy (e.g. Schott 1998, pp. 223-261) and led directly to one of the largest and longest enrollment declines on the UNESCO record. These experiences do not eliminate the possibility that these countries might have raised enrollments with massive policy effort *if* economic conditions had been different. But instability, bungled economic plans, conflict, volatile terms of trade, and so on are the rule in the developing world, not the exception. For an education minister to claim that universal primary education could have been achieved in a developing world without turmoil is indeed of little use. The effect of such upsets on the economy and therefore on the incentives to invest in education are major determinants of education progress that are far beyond the control of Education Ministry budgets.

Finally, the table gives a few examples of very poor countries for which the enrollment numbers reported by UNESCO have risen at a rate sufficient to meet even extremely ambitious goals. While the world has looked to some of these countries to justify the feasibility of the Millennium Development Goals, it is important to look very closely at these numbers for Togo, Rwanda, Malawi, Uganda, Botswana, and Indonesia.

In Togo in the mid 1990s, as UNESCO-reported net primary enrollment soared from 69% to 84% in just two years, roughly *half* of primary students failed and were held back (of 663,126 enrolled primary students in 1994, 304,742 failed; World Bank 1995, p. 36). This is likely to explain why, while Togo reported net primary enrollment of 92.3% to UNESCO in 2000, the World Bank places the true figure for 2000 at "no more than 65%" (World Bank 2003, p. 2). In other words, from 1985 to 2000 Togo's net primary enrollment probably grew roughly five or perhaps ten percent—important and meritorious progress, to be sure, but more slowly than the typical post-1960 country, which would have increased enrollment by about 13% during that period starting from similar levels.

The story is similar in Rwanda, where "the entry rate to first grade did not improve and can therefore be excluded as a factor behind the increase in educational coverage" during the late 1990s. Most (57%) of the sharp rise in enrollments "reflects increased recycling within the system" as failure/repetition rates soared threefold in the 1990s, reaching 38% in grade 5. The remaining minority of the increase is explained by an increase in survival rate to the end of the primary

education cycle, but "high rates of grade repetition ... raise concerns about the sustainability of the gains in cohort survival rates" (World Bank 2003, pp. 25-6). A rise in enrollment based in its majority on failing students cannot be considered an exportable 'best practice' of any kind.

In the statistics that Malawi has reported to UNESCO, net primary enrollment skyrocketed from roughly 50% in 1990 to 103% in 1994 and 101% in 2000. While the careful analysis of Al-Samarrai and Zaman (2002, p.3) agrees with the 1990 figure, it estimates 1997/8 enrollment at only 77%. Even after this reality check, an increase of 25-30% in a decade appears impressive. But it cannot escape our attention that the astonishing increase in enrollments seen in Malawi was accompanied by a deterioration of the quality of school services to among the lowest in Africa (Castro-Leal 1996, p.17), severely compromising continuation rates and therefore the sustainability of the increase. The number of children per qualified teacher roughly doubled (ibid.).

In Uganda, the World Bank (2002, p.2) reports that gross primary enrollment nearly doubled between 1996 and 1999, after President Museveni honored his election promise to abolish school fees for up to four children per family. Did the president really double enrollment? Let us set aside for a moment the findings of Ablo and Reinikka (1998, Table 2), who question whether or not enrollments started out as low as the government claims, suggesting that official figures may have underestimated true 1993-1995 enrollments by as much as one third and thereby exaggerating the post-1996 growth rate. Even though enrollments did rise after 1996, getting those children through the door required much more than low fees. First, it was also a product of explosive economic growth seen almost nowhere else in Africa. That is, "[t]he Ugandan government has been able to meet its objectives in the area of primary education, because as a prior condition it established macroeconomic stability" (Stasavage 2003, p. 3). While Uganda touted the "political will" it demonstrated in raising enrollments so quickly, its education ministry also pointed out that the government's ability to do so was initimately related to emerging from two decades of war and instability to one of the highest economic growth rates in the world (Republic of Uganda 1999, p. 19). The increase additionally was accompanied by a dramatic decline in education quality. Over the same 1996-1999 period, the number of 3rd grade pupils achieving a "satisfactory score" on the English oral test collapsed from 92% to 56% (World Bank 2002b, p.3). The World Bank reports that the number of pupils per student soared from 35.2 in 1995 to 60.1 in 1998. The symmetry of these numbers is arresting; Uganda doubled enrollments not only by lowering fees but also by promising job growth for graduates in the middle of a boom, packing twice as many children into

every classroom, and roughly halving their test scores. Indeed, Deininger (2003, p. 303) finds that in Uganda, it is "impossible to reject the hypothesis that, in quality-adjusted terms, there has been little change in the cost of primary education."

This last is not the case in Botswana, but the rapid gains achieved in that country leading up to 1990 proved temporary. Net primary enrollment in Botswana fell from 93% to 84% over the course of the 1990s. Ethnic homogeneity and one of the world's fastest growing economies were closely related to the initial enrollment gains (Duncan et al. 1997), and Botswana's dubious distinction as the center of the AIDS calamity is closely linked to the slippage since then (Ainsworth et al. 2002; Bell, Devarajan and Gersbach 2003). The story is analogous for Indonesia, the last country in the table, before 1985. Rapid enrollment gains in that country were accompanied by massive school construction, but even so, as a fraction of GDP education spending was low by world standards. Perhaps what mattered most was the rapid economic growth that raised millions out of poverty during this period and buoyed parents' expectations regarding their childrens' opportunity set, encouraged in no small measure by a one-off resource boom and a political stability that many other countries of Southeast Asia did not enjoy at the time. Like Botswana, Indonesia's enrollment achievements proved fragile and vulnerable to subsequent crises, falling to 92% in 2000. One wonders how much education policymakers in other countries can truly learn from enrollment changes during booms in arguably two of the most the economically successful poor countries of the late 20th century that started out truly poor—except to note that economic development is a good thing and is often influenced by conditions beyond the reach of policy.

Some other countries of potential interest are not listed in the table because UNESCO's net enrollment data cover these countries sparsely: Malaysia, Thailand, China, and Cuba. But even these countries offer little hope of an exportable best practice capable of producing atypically sharp rises in net primary enrollments elsewhere. Malaysia followed the typical transition speed closely, rising from 88% in 1970 to 98% in 2000, while the typical country would have hit 96% in 2000. Thailand lagged slightly behind, rising from 72% in 1965 to 85% in 2000, wheras the typical country would have reached 90% by 2000. Both China and Cuba are difficult to analyze based on the UNESCO figures, since both of these opaque and totalitarian governments claim enrollments near 100% in all the years for which UNESCO has data. But Aguirre and Vichot (1996) find that in Cuba, for example, primary enrollment figures are inflated and "are the result of a generalized tendency to exaggerate real revolutionary achievements to ... an implausible extent." And even if

we are to believe China's and Cuba's largely inscrutable statistics, the motive force behind so much government involvement in education might be that of political indoctrination—as argued forcefully by Pritchett (2002)—a practice of hopefully limited exportability. Mehrotra (1997) also questions the sustainability of top-down educational achievements in Cuba in the face of a vapid economy that, now a decade and a half on, has not adjusted its international relationships to accommodate the collapse of the Soviet Union.

Taken together, these stories do not bode well for the prospects of very recent surges in enrollments in neighboring Kenya and Tanzania after they abolished school fees in during 2002-2003. There can be no doubt that Malawi, Uganda, and now Kenya and Tanzania have demonstrated that the demand for schooling can be highly price elastic when considered independently of the quality of education, the sustainability of the increase, and the political and economic conditions under which it occurs. For Malawi and Uganda, the declines in quality have been sufficient to suggest that demand for *human capital* is price inelastic even as demand for *schooling* is elastic. The experiences of Togo and Rwanda have suggested that massive increases in enrollments can hide massive increases in failure and retention, inviting questions about the sustainability of enrollment rises for any more than a few years. And the unique conditions under which most of these rises have occurred are strikingly uniform: in Malawi, Kenya, and Tanzania the increases followed within three years of the death or departure from government of an influential individual whose régime's failed policies had helped hobble the economy for decades, while in Rwanda they followed resolution of major armed conflict. Inflated expectations of a new era of opportunity in these countries, as much as did the *de facto* opportunities in the booming Uganda of the 1990s or Indonesia of the 1970s, may have led to increased perception that in the near future an unschooled child would be more economically disadvantaged. Such feelings would prop up the propects of candidates promising to eliminate school fees, and make parents willing to send their children to shoddy classrooms teeming with 60 children or more per underqualified teacher. But like all bubbles, this one too must pop unless the fundamentals are right. Unless the graduates are truly better off for the investment they made, which is to say that unless jobs await them to which they could not otherwise have aspired, enrollments are likely to stagnate or fall in these countries after a few years. And other countries seeking to mimic their rapid increases may do so in vain in the absence of conditions for a similar bubble, conditions largely beyond the reach of education ministers.

These cases have a message. Meeting the Millennium Development Goals for education will

require very fast enrollment increases for many countries, and increases at comparable speeds have been seen almost exclusively in countries sharing certain characteristics. These countries 1) are frequently small; 2) carry out incomplete censuses of the general population or fail large fractions of their students, inflating enrollment ratios; 3) experience enviable economic booms far beyond the realm of education policy; 4) experience a one-off end to warfare or decades of repressive rule, producing a surge of hope for future economic opportunity, and/or 5) are willing to accept a débâcle in the amount of quality attention that each child receives from quality teachers.[13] Certainly none of these can serve as a readily-exportable 'best practice.' In other words, after we look more closely at fabled national success stories, we see tremendous progress but we do *not* see examples of countries that have started from the levels of today's low-enrollment countries and achieved "complete free and compulsory primary education of good quality" in very short periods. Meanwhile, the world is filled with countries that have achieved this goal more slowly—over the span of several decades, at remarkably uniform long-term rates. This does *not* mean that many African countries would not do well to emulate many aspects of, say, Uganda's or Botswana's experience. In doing so, they might progress *faster* than they otherwise would have, but they are extremely unlikely to progress *as fast as necessary* to meet the Millennium Development Goals.

9 Discussion

9.1 Policy and resources matter—within limits

Figure 5 summarizes the message of this investigation. The x-axis is transition speed a, and the y-axis is the number of countries with that transition speed. The country-by-country estimates of a shown are for those countries for which we have at least three datapoints, allowing a country-specific fit of equation (5).[14] The estimates are given in a histogram with bins of width 0.025. The bell-shaped outline is that of a normal distribution with the same mean and standard deviation of the population shown. Note the average transition speed of roughly 0.04, familiar from Table 4. The arrows to the right of the curve show the hypothetical transition speed that would be necessary to reach 95% net primary enrollment by 2015, given various starting levels in the year 2003. In

[13] Duraisamy et al. (1997) likewise find that rapid increases in school enrollments in Tamil Nadu, India were accompanied by massive deterioration in school conditions and education quality.

[14] In cases where countries report $s > 100\%$ in any year, a nonlinear fit of $s_t = c\left(1 + e^{-a(t-b)}\right)^{-1}$ is performed to allow calculation of an idiosyncratic maximum toward which that country is converging, as in column 3 of Table 4.

brief, anything approaching universal primary enrollment by 2015, starting at anything less than 80%, requires increases in enrollment without any precedent in the long-term trends of all countries from 1960-2000 for which we have data. Among the countries for which UNESCO has data on net primary enrollment in 2000, 39 are below 80%.

In other words, for dozens of countries, the only education policy that could achieve the latest round of development goals would be one without meaningful precedent. Burkina Faso would have to figure out something that Korea did not. Since this is the third or fourth time that the international community has been through such a paroxysm of pledges and frustration, perhaps it is time to stop empty promises of unprecedented action and let precedent suggest what is feasible. The latest goals, taken literally, are not feasible.

Some of the goals' advocates do openly recognize this. Vandemoortele (2003) agrees that the world is not "on track" to meet the education-related Millennium Development Goals, but falls into the pattern recycled for over four decades—attributing this to "broken promises" of aid. Since his and co-authors' estimate of the "cost" of meeting the goals is "affordable," then clearly only political will can be to blame. But as rich-country parents know, putting up enough money to send your daughter to college does not guarantee that she will go, much less that she will complete the degree.

There is an alternative conclusion from the same evidence. Although aid and education policies matter, and although money can certainly buy some degree of advancement in educational attainment, perhaps short-term utopian goals *cannot* be bought. Perhaps there is a common reason why today's developing countries are so daunted by rapid increases in educational attainment and why today's rich countries could not quickly 'buy' universal primary schooling when they were developing. Perhaps the statistically significant impacts of education policy on parents' educational decisions for their children do not compare in magnitude to the impact of long-term economic changes on those decisions.

The standard World Bank view is that to achieve universal primary education by 2015, "[t]he most important actors are clearly the governments," by which he means that governments must give "high budgetary priority" to education (Fredriksen 2002, p. 4). The evidence simply does not support this view. The micro studies show that the most important actors are clearly parents, people whose incentives can only be modified to a limited degree by governments, as well as government actors outside the education policy sphere who shape the economic environment in which those parents act.

9.2 What the evidence does *not* imply

It is important to review three things that this study does *not* claim:

Emphatically, the message of this work is *not* that "history doesn't matter" nor that countries' idiosyncratic institutions and policies have no effect on a purely mechanistic world. This study speaks only to the determinants and range of the transition speed (a), and is mute on the subject of when the transition begins (b_i). Easterlin (1981), Benavot and Riddle (1988), and Lindert (2001) make a strong case that political and institutional differences across countries have throughout history helped determine the date of takeoff toward mass schooling alongside economic forces. They do not address, however, why the rate of change in enrollments across such different countries have been so notably uniform.

Likewise, this analysis does not claim that policy doesn't matter. Within limits, the micro literature reveals that building more schools, with better-trained teachers using better materials can increase enrollment rates. This is perfectly compatible with the fact that over the long term these adjustments are not the primary determinant of the speed of transition from low enrollments to high. Similarly, while few doubt that the US president or Federal Reserve Chair can affect economic performance, Landon-Lane and Robertson (2003) find that government policies have been irrelevant to the *long-run* growth rates of OECD countries. Policy and money may matter, but that does not mean that sufficient policy and sufficient money can reach *any* goal.

Finally, this work does not in any way imply that the Millennium Development Goals are useless. The purpose of setting international development goals is to solve a collective action problem in order to generate policy effort adequate to the task, not to convince the world that all real outcomes are the result solely of policy effort. Gaiha (2003) points out that while meeting the goals is "not plausible," they are nevertheless "useful in drawing attention to pervasive deprivation in developing countries." Like so many others he concludes, however, that the result of such attention should be "a determined and co-ordinated effort by the development community." The realization that we are far from utopia can motivate public action, in the area of education policy for instance, and public action can certainly accomplish many good things. But this should not be the only lesson we draw. We might also come to see that sound economic performance is essential to expanding educational systems, and that the chaos brought on by poverty traps and economic misrule might do more to make meeting the goals "not plausible" than anything that education funders and policymakers are

failing to do. The problem is that no one is sure how to break poverty traps nor how to conjure up economic growth, nor that these challenges are vulnerable to even the most "determined and co-ordinated effort."

9.3 Country specific goals, grounded in history

Why donor and recipient governments have signed up for yet another round of ambitious goals and inevitable failure was discussed briefly earlier but is not our focus here. It may be that there are good political reasons why unprecedented progress has been labelled as 'failure' in the past—and will be again in 2015. But this label need not be heeded by those outside the game.

Table 15 shows what historically-grounded, country-specific education goals might look like for six countries. The goal numbers, in italics, challenge each country to match the performance of the typical developing country after 1960. That is, they challenge policymakers for each country to beat the performance of roughly half the countries on earth, no small feat. For example, a historically-based goal for Niger would be to have 45% net primary enrollment by 2015 and a ratio of girls' to boys' gross primary enrollment of 0.83. Some would consider these unambitious, yet they assume that Niger follows the typical transition speed in both areas, and certainly the goal of beating the performance of roughly half the countries on earth is quite ambitious for Niger and its peers.

Of course 'recommending' that countries set historically-based development goals is futile if the reason for the cycle of ambitious goals is politically motivated, but at the very least the simple formulas for country-specific goals implied by Tables 4 and 7 provide tools with which others may challenge that political roundabout and question its normative conclusions. Equation (5) and Table 4, for example, imply that a country performing at the level of the typical country after 1960, starting at net primary enrollment fraction s_0 in year t_0, will reach enrollment s in the year $t = t_0 + (1/a)\left[\ln\left((1/s_0) - 1\right) - \ln\left((1/s) - 1\right)\right]$, where $a \approx 0.038$.

10 Conclusion: What government *can* do

10.1 Act first outside the classroom

Just because goal-setters promise the moon and deliver merely the earth does not mean that aid should not seek to do what it can, where it can, nor that recipient governments should not do

what is within their power to expand opportunities for education. But if there is a limited role for *education policy* in working toward these goals, what is a well-intentioned government to do? To be sure, governments can affect educational outcomes with interventions including public health, strengthening institutions, and promoting job opportunities for the poor. Miguel and Kremer (2003), for example, have shown that an intenstinal worm treatment experiment decreased Kenyan school absenteeism by one quarter. And Ablo and Reinikka (1998) find that building governance institutions (read: battling corruption) can increase the degree to which education budgets benefit children.

But many of these successful interventions begin to look suspiciously like economic development, not heroic education policy. And economic development takes a long time. It might be better to think of education expenditures as endogenously determined by economic and demographic development, as in Schultz (1989) and by political and institutional forces as in Pritchett and Filmer (1999) and Addison and Rahman (2001), not by goals, pledges, or huge omnibus international aid coffers. Fuller and Rubinson's (1992) sweeping century-and-a-half review of the institutional forces shaping schooling expansion in today's rich countries—bluntly entitled "Does the State Expand Schooling?"— concludes,

> Empirical evidence to date suggests that state actions—material and symbolic—can influence school enrollments under certain conditions. To review, the forms of effective action may include the political crafting of labor structures; opening the opportunity structure and signaling that more schooling will yield economic returns; directly raising the supply of schools and pupil places; linking schooling to broader Western ideals regarding enfranchisement, national integration, and individual development; and lowering perceived opportunity costs by restricting child labor and legitimating the school as the normative location for socialization.
>
> These actions can only be mounted by 'strong states.' And underlying political-economic conditions define the likelihood that strong actions can be legitimately pursued and that they will hold actual effects on school expansion. [...]
>
> In nineteenth-century France [national schooling expansion was constrained by] a fragile, contested central state; low capital accumulation and industrialization; a persistently low level of economic integration; and relentless strength of the Church and its traditional allies. Only when these contextual constraints on the state lessened would construction of schooling by the central political actors be possible. [...]
>
> School construction continues. But state actors are no longer the master craftsmen.

10.2 But education policy remains important

This pattern persists; policy can move hills but not mountains. There is now ample evidence, for example, that conditioned transfers for education make a difference. These programs, made famous

by pioneering work in Mexico by PROGRESA (now known as *Oportunidades*) and successfully replicated in various countries, can raise school enrollment rates among poor families (Morley and Coady 2003). Likewise, education policy approaches like India's District Primary Education Program, Ethiopia's Basic Education Systems Overhaul, and Colombia's PACES voucher program (among many others) have produced documented results. Can these interventions affect enrollments? Little doubt remains. Can they cause enrollments to skyrocket in short periods? This we have every reason to doubt. At the end of the day, poor people send their children to school if it will mean a better life for the family over the long term than not doing so. The rewards of that decision continue to depend far more on the job opportunities available to schooled children than on any of the above interventions, no matter how successful.

Those opportunities are the key. Governments can encourage human capital investment by reducing uncertainty in the economy (Levhari and Weiss 1974), they can listen to their citizens' demands (Chen and Desai 1997, p. 423)—pressure for increased schooling went up in Kenya and Malawi after the demise of repressive régimes—and they can soundly manage the economy to ensure that bungled macro interventions the brain drain do not erase any positive impacts of schooling on the economy (Rogers 2003). 'Sound management' and 'do no harm' are not in the least banal; witness the massive declines in school enrollments in both Zimbabwe and Tanzania from 1985 to the late 1990s. Both countries engaged in horrendous mismanagement of the economy while producing strong budget allocations for education and plentiful rhetoric about their commitment to children.[15]

10.3 A fertility analogy

For some aspects of the development process, such as changes in women's fertility, there is growing (though by no means universal) acceptance in the donor community that the economic environment is a fundamental causal factor (e.g. Schultz 2001). Most development policymakers will tell you that families' fertility choices take place within an economic context that evolves slowly over time and according to patterns that have been repeated over and over in various countries. The heads of state who adopted the Millennium Development Goals notably refrained from declaring that the fertility of every poor woman on earth shall be that of a Norwegian woman by 2015, refusing to seek to buy this outcome with sufficient foreign aid or 'getting serious' in imposing laws to that effect.

[15] The World Bank's *World Development Indicators* reports Zimbabwe's expenditure per primary student as a percent of GDP per capita, averaged over the 1990s, as 18.8, above the LDC average of 13.3. Its total education expenditure as a percent of GDP was 8.2 percent, far above the LDC average of 4.5.

Until relatively recently many believed that low fertility *could* be bought, but acceptance has grown in recent years that even the existence of some degree of 'unmet need' in family planning does not at all imply that *any* degree of fertility reduction is achievable in *any* time period if only the aid intervention is large enough (e.g. Pritchett 1994, Sathar and Casterline 1998, Basu and Amin 2000). Why, then, do many consider households' decisions to have children in a radically different light from their decisions to invest in their childrens' schooling? Only a totalitarian state would accept extremely ambitious development goals relating to fertility decisions; China's ambitious national goals in this arena may not have survived in an environment of democratic accountability, meeting the same fate as did compulsory sterilization in India in 1970s. This does not mean that donors and LDC governments have no fertility goals nor that they do nothing for the fertility transition; on the contrary, they support it with countless aid interventions. But they do not set radical, Herculean goals in the arena of fertility because they realize the limited impact of government policies in that particular household decision in the absence of major changes in the economic sphere.

10.4 Success without *saltum*

The same realization seems not to have occurred widely in the field of education. "Incentives" and "decentralized decisionmaking" are "alien terms to education, in both industrial and developing countries," decries Hanushek (1995). Abundant evidence suggests that families in poor countries often realize their desired level of human capital investment in their children, and this desire is shaped by many complex and interacting factors of which the existence of a nearby school or the quality of the teacher therein may not be the most important. Goal-setters seeking to affect that desire may do well to better understand the incentives faced by those families before calling for billions in supply-side education sector interventions, and outsiders seeking to understand ahistorical proclamations of 'failure' to meet education goals may do well to better understand the incentives faced by goal-setters.

For a long time, academics have been noting from on high the stark fact of gradual economic development—from Alfred Marshall's economic slant on Darwin's *natura non facit saltum* ('nature does not make leaps') through Göran Hydén's classic *No Shortcuts to Progress.* And for a long time, policymakers on the ground have called for immediate change—from former Brazilian President Kubitschek's "fifty years in five years", to Samper's *Salto Social* ('social leap forward') in Colombia, to James Wolfensohn's current calls for a "quantum leap" by donors. Today, without doubt, the

international education policy arena has been conquered by the "leap to equality."[16] Perhaps after the universal schooling goals for 2015 and then 2030 go unmet, while developing countries continue to raise school enrollments at breakneck speeds, this will change. But even if it does not, let us at least look askance at the coming proclamations of failure, and celebrate success where it occurs. This foreboding century needs more to look forward to.

[16] Subtitle of the Education for All *Global Monitoring Report 2003/4* published by UNESCO.

Table 1: Development goals for universal primary education

Goal year	Approved	Forum
—	1934	International Conference on Public Education, Geneva
—	1948	UN Universal Declaration of Human Rights, New York
—	1951	International Conference on Public Education, Geneva
—	1952-54	UNESCO Regional Conferences on Free and Compulsory Education; Bombay, Cairo, and Lima
1980	1960	UNESCO Meeting of Representatives of Asian Member States on Primary and Compulsory Education, Karachi ("Karachi Plan")
"	1961	UNESCO Conference of African States on the Development of Education in Africa, Addis Ababa ("Addis Ababa Plan")
"	1962	UNESCO Conference of Ministers of Education and those Responsible for Economic Planning, Santiago ("Santiago Plan")
"	1966	UNESCO Conference of Ministers of Education and Ministers Responsible for Economic Planning in the Arab States, Tripoli
"	1970	International Development Strategy for the Second UN Development Decade, New York
2000	1979	UNESCO Conference of Ministers of Education and Those Responsible for Economic Planning of Member States in Latin America and the Caribbean, Mexico City
"	1980	International Development Strategy for the Third UN Development Decade, New York
"	1990	World Conference on Education for All, Jomtien ("Jomtien Declaration")
"	1993	Education for All Summit of Nine High-Population Countries, Delhi ("Delhi Declaration")
2015	1995	Fourth World Conference on Women, Beijing ("Beijing Declaration and Platform for Action")
"	1996	Shaping the 21st Century, OECD Development Assistance Committee
"	2000	World Education Forum, Dakar ("Dakar Declaration")
"	2000	Millennium Summit, New York ("Millennium Declaration")
"	2001	Road map towards the implementation of the United Nations Millennium Declaration

Table 2: Development goals for gender parity in education

Goal year	Approved	Forum
—	1960	UNESCO Convention against Discrimination in Education
—	1967	UN Declaration on the Elimination of Discrimination against Women
—	1981	UN Convention on the Elimination of All Forms of Discrimination against Women
1980	1975	World Plan of Action for the Implementation of the Objectives of the International Women's Year, Mexico City
1995	1980	Programme of Action for the Second Half of the United Nations Decade for Women, Copenhagen
2000	1985	Nairobi Forward-Looking Strategies for the Advancement of Women Towards 2000
"	1993	UNESCO and UNICEF Pan-African Conference on the Education of Girls ("Ouagadougou Declaration")
2005	1995	Fourth World Conference on Women, Beijing ("Beijing Declaration and Platform for Action")
"	1996	Shaping the 21st Century, OECD Development Assistance Committee
2015	2000	Millennium Summit, New York ("Millennium Declaration")
"	2001	Road map towards the implementation of the United Nations Millennium Declaration

Table 3: Summary of data

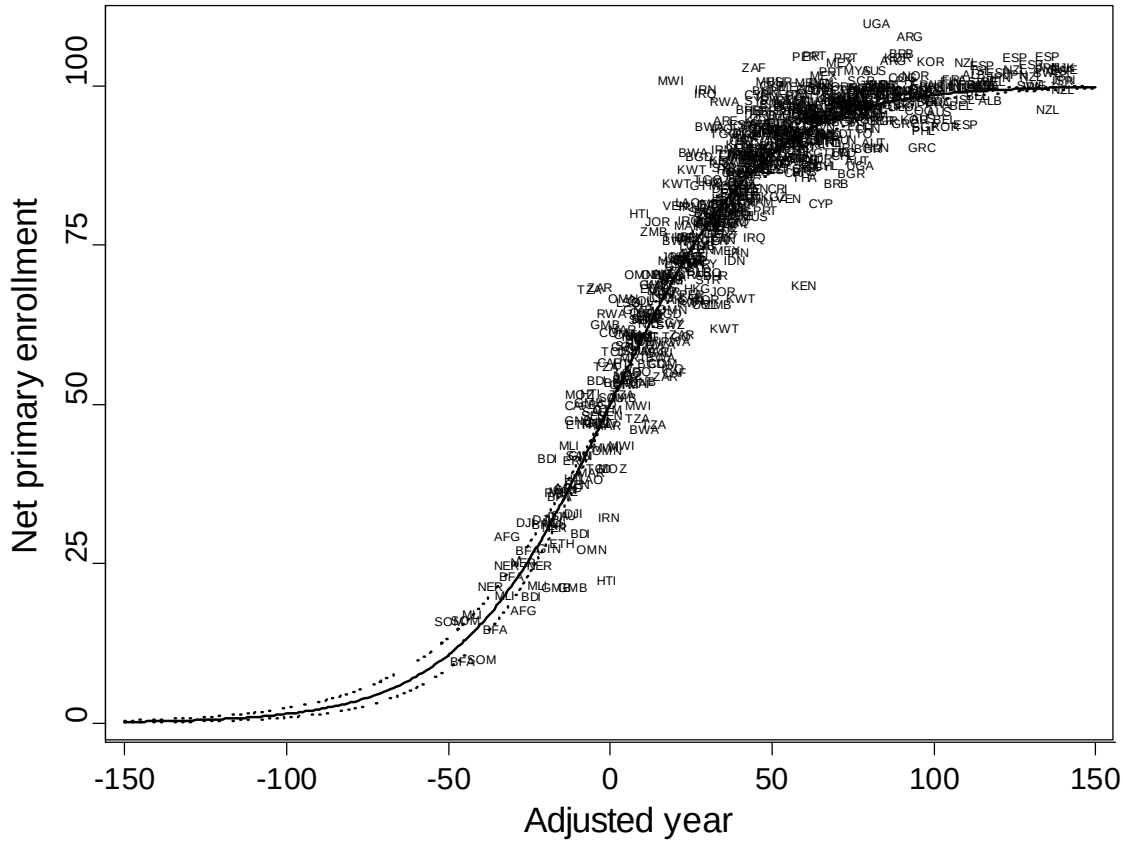
Variable	N	μ	σ	Min.	Max.
Panel 1960-2000					
Net primary enrollment	654	0.808	0.211	0.100	1.110
Female net prim. enrol.	562	0.784	0.240	0.069	1.093
Male net prim. enrol.	560	0.825	0.198	0.120	1.127
Female net sec. enrol.	378	0.536	0.299	0.003	1.014
Male net sec. enrol.	378	0.539	0.276	0.014	1.003
Female/Male gross prim. enrol.	1,421	0.831	0.234	0.042	1.250
Female/Male gross sec. enrol.	1,402	0.765	0.312	0.008	1.408
Panel 1865-1914					
Primary enrollment/population age <15	383	0.212	0.173	0.001	0.579
Cross section 1980					
Public expenditure on education/GDP	174	0.040	0.018	0.005	0.113
Pupils/teachers, primary	163	0.310	0.132	0.068	0.815
GDP per capita, PPP (hundreds $)	131	43.8	43.0	3.46	254
% of population urban	190	0.453	0.237	0.0390	1.00
Women's lifetime fertility	184	4.45	2.01	1.41	9.93
% value added in agriculture	132	0.205	0.158	0.002	0.720
% value added in manufacturing	108	0.146	0.089	0.006	0.460
% of adults with primary education	106	0.422	0.268	0.014	0.973
% of adults with higher education	106	0.022	0.026	0.000	0.129
Education Gini coefficient	81	0.477	0.204	0.100	0.957
% of parliament female	153	0.136	0.088	0.000	0.427
% of labor force female	170	0.367	0.105	0.051	0.554
Socialist dummy	207	0.101	0.302	0.000	1.000
% pop. Hindu or Buddhist (1970)	205	0.052	0.178	0.000	0.923
% pop. Muslim (1970)	205	0.209	0.341	0.000	0.998
% pop. Christian (1970)	205	0.582	0.400	0.000	0.999
% pop. 'Ethnorelgionist' (1970)	205	0.069	0.143	0.000	0.669

Table 4: Quantifying the speed of the education transition, 1960-2000

Estimator	OLS	OLS	Nonlinear LS
Dependent variable	$-\ln(1/s_{i,t}-1)$	$-\ln(1/s_{i,t}-1)$	$s_{i,t}$
Sample	All	$i \vert s_{i,t} < 100 \forall t$	All
Year	0.0381	0.0372	0.0426
Std. error	(0.00331)	(.00337)	(0.00259)
95% conf. int.	[0.0316, 0.0446]	[0.0305, 0.0438]	[0.0375, 0.0477]
Max. $s_{i,t}$	$\{\equiv 100\}$	$\{\equiv 100\}$	101
Std. error			(1.00)
95% conf. int.			[98.6, 103]
N	562	471	625
Countries	129	108	138
Avg. N/country	4.36	4.36	4.53
Country dummies	Yes	Yes	Yes
Constant term	Yes	Yes	No
R^2	0.820	0.828	0.916

Standard errors are in parentheses. Curly brackets indicate a value assumed by the model specification. Square brackets indicate 95% confidence bounds on the coefficient estimate.

Figure 1: The transition in net primary enrollment: all countries, 1960-2000



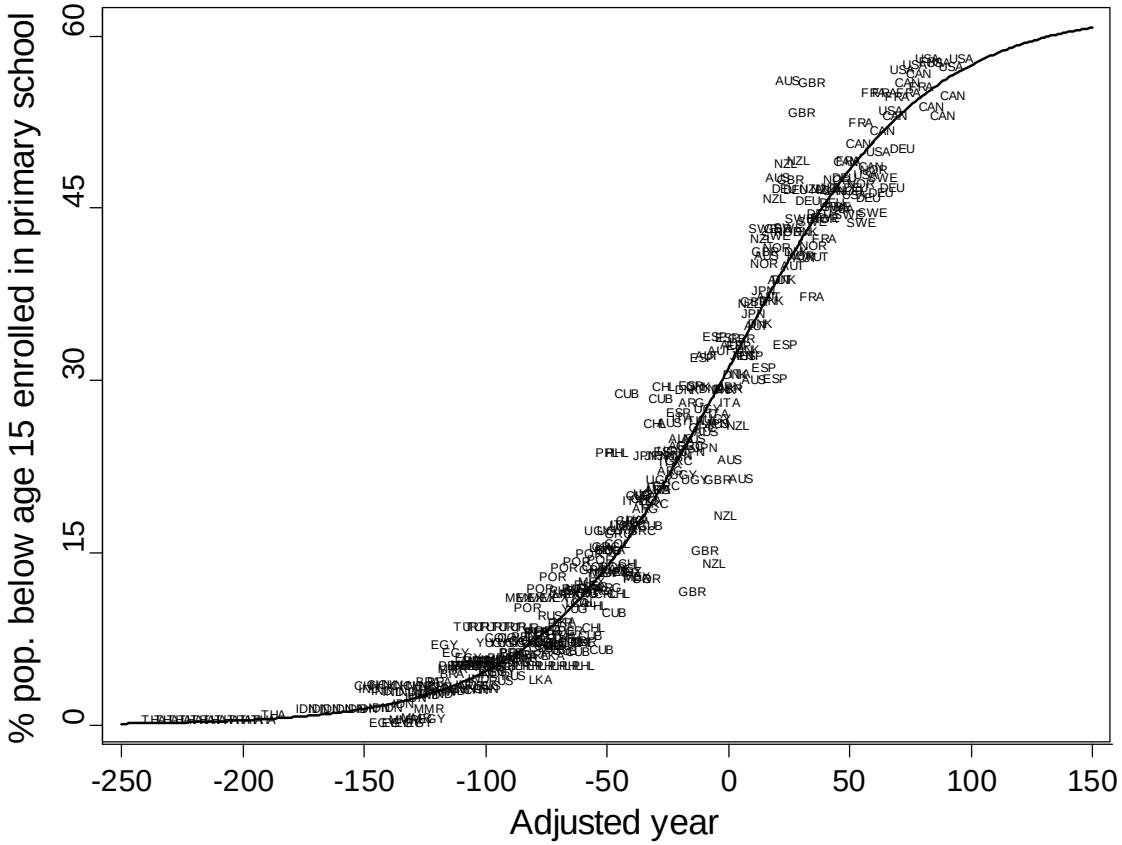
"Adjusted years" are the elapsed time since 50% enrollment. Datapoints show country-years, spaced quinquennially. Solid line shows fitted line from first column of Table 4, dotted lines show 95% confidence interval on parameter a from the same table.

Table 5: Quantifying the speed of the education transition, 1865-1914

Estimator	OLS		Nonlinear LS	
Dependent variable	$-\ln(1/s_{i,t}-1)$		$s_{i,t}$	
Sample	All 35	16 richest	All 35	16 richest
Year	0.0267	0.0273	0.0251	0.0231
Std. error	(0.00160)	(0.00209)	(.00171)	(0.00289)
95% conf. int.	[0.0236, 0.0299]	[0.0232, 0.0314]	[0.0217, 0.0285]	[0.0174, 0.0288]
Max. $s_{i,t}$	$\{\equiv 60\}$	$\{\equiv 60\}$	62.2	64.1
Std. error			(2.39)	(4.13)
95% conf. int.			[57.4, 66.9]	[55.9, 72.2]
N	383	174	383	174
Countries	35	16	35	16
Avg. N/country	10.9	10.9	10.9	10.9
Country dummies	Yes	Yes	Yes	Yes
Constant term	Yes	Yes	No	No
R^2	0.938	0.872	0.984	0.988

Standard errors are in parentheses. Curly brackets indicate a value assumed by the model specification. Square brackets indicate 95% confidence bounds on the coefficient estimate.

Figure 2: The transition in primary enrollment: 35 countries, 1865-1914



"Adjusted years" are the elapsed time since 50% enrollment. Datapoints show country-years, spaced quinquennially.

Table 6: Determinants of primary net enrollment transition speed

Dependent variable	$-\ln(1/s_{i,t}-1)$			
Year	0.0365***	−0.0516	0.0614***	−0.0307
	(0.0125)	(0.0534)	(0.0166)	(0.0480)
	[0.324]	[−0.459]	[0.549]	[−0.275]
Year × educ. spending/GDP	0.198	0.119		
	(0.309)	(0.336)		
	[4.41]	[2.65]		
Year × pupil-teacher ratio			−0.0523	−0.0815
			(0.0478)	(0.0588)
			[−8.40]	[−13.1]
Year × GDP/capita PPP		0.000658**		0.000406
		(0.000291)		(0.000333)
		[26.7]		[15.0]
Year × urbanization		−0.109**		−0.0950**
		(0.0448)		(0.0458)
		[−38.5]		[−33.5]
Year × fertility		−0.000616		−0.000291
		(0.00505)		(0.00506)
		[−1.53]		[−0.0712]
Year × % value added agric.		−0.126*		−0.105
		(0.0748)		(0.0725)
		[−22.6]		[−18.8]
Year × % value added manuf.		0.173**		0.169*
		(0.0869)		(0.0863)
		[18.4]		[18.1]
Year × % adults w/ prim. educ.		0.106**		0.126**
		(0.0485)		(0.0508)
		[30.8]		[35.4]
Year × % adults w/ high. educ.		−0.959***		−1.11***
		(0.359)		(0.376)
		[−27.1]		[−28.7]
Year × education Gini		0.183***		0.185***
		(0.0546)		(0.0546)
		[44.7]		[44.6]
Country dummies	Yes	Yes	Yes	Yes
N	251	251	247	247
Countries	51	51	50	50
Avg. N/country	4.92	4.92	4.94	4.94
R^2	0.744	0.774	0.740	0.772
Adjusted R^2	0.677	0.702	0.673	0.700

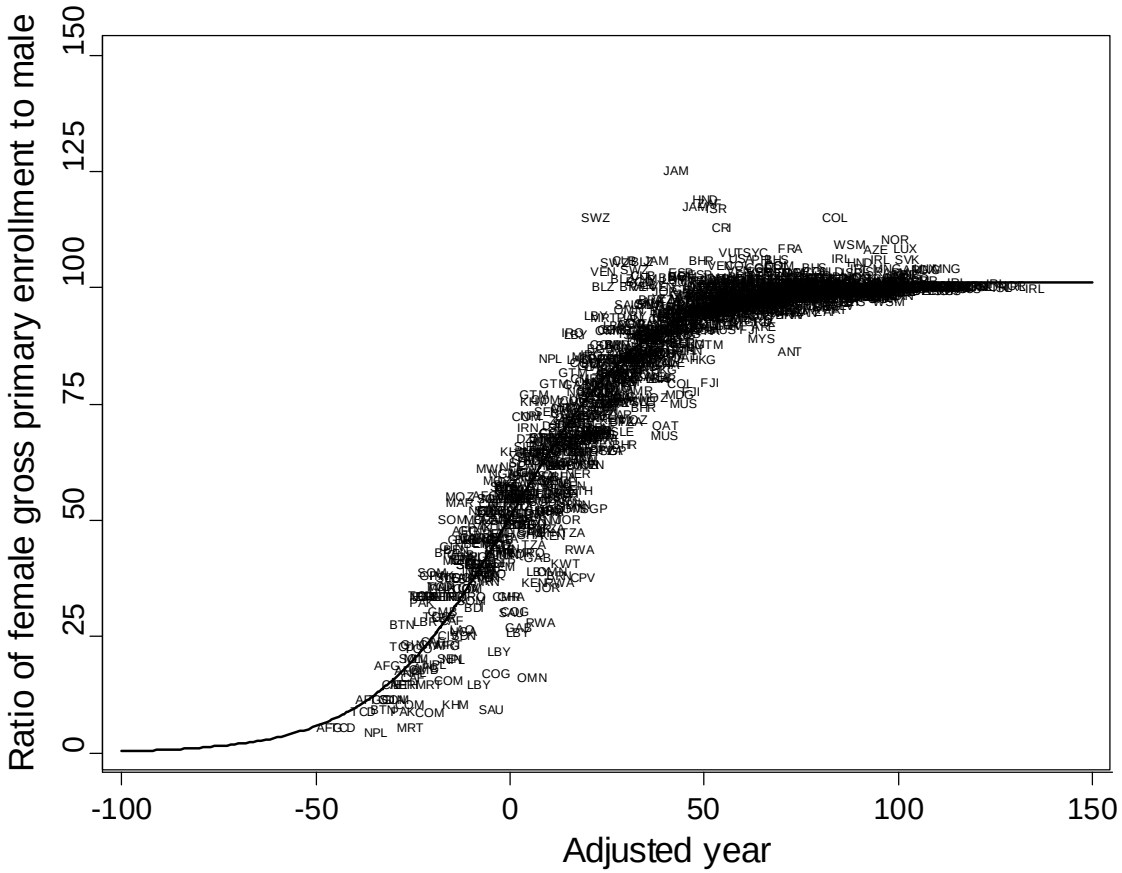
Standard errors are in parentheses; standardized "beta" coefficients are in square brackets. Significant at * 10%, **5%, ***1% level.

Table 7: Quantifying the speed of the gender transition in education, 1950-2000

Estimator	OLS		Nonlinear LS	
Dependent variable	$-\ln\left(\left(s^f_{i,t}/s^m_{i,t}\right)^{-1}-1\right)$		$s^f_{i,t}/s^m_{i,t}$	
Type of gross enrollment	Primary	Secondary	Primary	Secondary
Year	0.0540	0.0653	0.0562	0.0539
Std. error	(0.00150)	(0.00191)	(0.00111)	(0.00149)
95% conf. int.	[0.0511, 0.0570]	[0.0615, 0.0690]	[0.0541, 0.0584]	[0.0510, 0.0569]
Max. $s_{i,t}$	$\{\equiv 100\}$	$\{\equiv 100\}$	101	113
Std. error			(0.352)	(0.798)
95% conf. int.			[101, 102]	[111, 114]
N	1,142	929	1,422	1,394
Countries	168	139	188	181
Avg. N/country	6.80	6.68	7.56	7.70
Country dummies	Yes	Yes	Yes	Yes
Constant term	Yes	Yes	No	No
R^2	0.890	0.823	0.936	0.893

Standard errors are in parentheses. Curly brackets indicate a value assumed by the model specification. Square brackets indicate 95% confidence bounds on the coefficient estimate.

Figure 3: The gender transition in primary enrollment: all countries, 1950-2000



"Adjusted years" are the elapsed time since 50% ratio of girls' gross primary enrollment to boys'. Datapoints show country-years, spaced quinquennially.

Table 8: The net enrollment transition speed, by gender

Estimator	OLS			
Dependent variable	$-\ln\left(1/s_{i,t}-1\right)$			
Type of net enrollment	Primary		Secondary	
Gender	Female	Male	Female	Male
Year	0.0412	0.0329	0.0662	0.0536
	(0.00434)	(0.00422)	(0.00293)	(0.00267)
Country dummies	Yes	Yes	Yes	Yes
N	481	464	333	333
Countries	122	120	92	92
Avg. N/country	3.94	3.87	3.62	3.62
R^2	0.842	0.824	0.942	0.934
Adjusted R^2	0.789	0.763	0.920	0.909

Standard errors in parentheses.

Table 9: Determinants of the gender differential in net enrollment transition speed

Dependent variable	$-\ln\left(\frac{1/s^f_{i,t}-1}{1/s^m_{i,t}-1}\right)$			
Type of net enrollment	Primary		Secondary	
Year	0.00713***	0.0221	0.0112***	0.0159
	(0.00261)	(0.0350)	(0.00137)	(0.0229)
	[0.102]	[0.316]	[0.286]	[0.407]
Year × GDP/capita PPP		−0.000224		0.0000895
		(0.000149)		(0.0000756)
		[−25.7]		[18.3]
Year × % parliament female		−0.00663		0.00357
		(0.0370)		(0.0163)
		[−1.70]		[1.80]
Year × Socialist dummy		−0.0106		−0.0172**
		(0.0119)		(0.00670)
		[−8.24]		[−17.7]
Year × % labor force female		0.0515		−0.0200
		(0.0379)		(0.0199)
		[13.0]		[−7.94]
Year × % adults w/ prim. educ.		0.0649**		0.00499
		(0.0225)		(0.0106)
		[49.9]		[6.27]
Year × % fertility		0.00839**		0.00137
		(0.00350)		(0.00170)
		[49.2]		[13.2]
Year × % Christian		−0.0940***		−0.0178
		(0.0281)		(0.0199)
		[−102]		[−31.5]
Year × % Muslim		−0.0915***		0.00972
		(0.0310)		(0.0219)
		[−85.0]		[14.8]
Year × % Hindu or Buddhist		−0.0603		0.00593
		(0.0386)		(0.0252)
		[−20.2]		[2.86]
Year × % 'Ethnoreligionist'		−0.108***		0.00113
		(0.0355)		(0.0235)
		[−52.4]		[0.817]
Country dummies	Yes	Yes	Yes	Yes
N	290	290	238	238
Countries	71	71	63	63
Avg. N/country	4.08	4.08	3.78	3.78
R^2	0.750	0.783	0.821	0.877
Adjusted R^2	0.669	0.698	0.756	0.822

Standard errors are in parentheses; standardized "beta" coefficients are in square brackets. Significant at * 10%, **5%, ***1% level.

Figure 4: Net primary enrollment scenarios for Burkina Faso

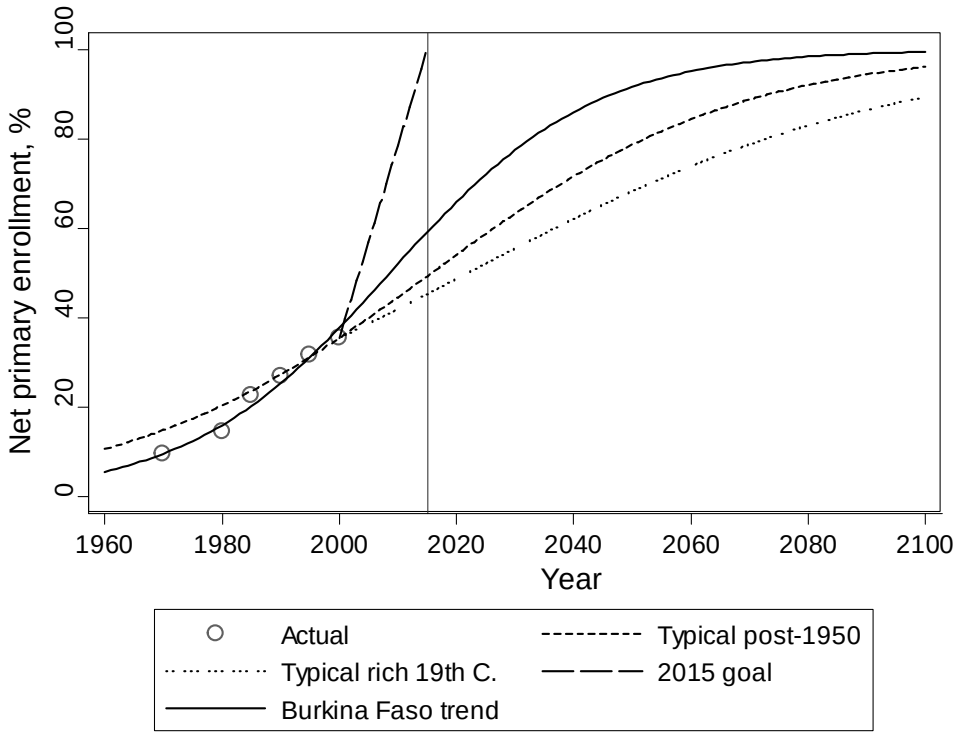


Table 10: Net primary enrollment: 'Off track' for the Millennium Goals, on track for history

Year	Actual 2000	Trend 2015	Typical post-1950 2015	Typical rich 19th Cent. 2015	*Est. year to reach 90%*	*GDP/capita in 1998 (1990 US$)*
Burkina Faso	35.5	59.2	49.4	45.4	*2047*	*676*
Eritrea	41.0	67.5	55.2	51.1	*2034*	*399*
The Gambia	68.7	86.2	79.5	76.7	*2021*	*850*
Guinea	47.0	68.4	61.1	57.2	*2040*	*612*
Madagascar	67.7	82.2	78.8	75.9	*2028*	*690*
Mali	43.3	62.8	57.5	53.5	*2043*	*783*
Morocco	78.0	89.0	86.3	84.2	*2017*	*2,690*
Nicaragua	80.8	88.2	88.1	86.3	*2020*	*1,450*
Senegal	63.1	76.6	75.2	72.0	*2037*	*1,300*

Table 11: 19th century 'development goals': They were richer and took longer

	Compulsory basic educ.	GDP/cap. (1990 US$)	Prim. enrollees/pop. <15 In that year	30 years later
United States	1852	2,020	42%	57%
Great Britain	1870	3,190	15%	43%
Canada	1871	1,730	49%	57%
Australia	1872	3,720	24%	34%
Italy	1877	1,640	20%	27%
New Zealand	1878	3,050	33%	46%
France	1882	2,230	51%	56%
Japan	1886	916	24%	38%

Table 12: Average net primary enrollment: Out-of-sample predictive power of the S-curve

Net primary enrollment	Actual	Predicted	Actual	Predicted
In year	1990	2000	2000	2015
Uses data available in	—	1990	—	2000
Sub-Saharan Africa	58.3	68.5	68.7	79.6
South Asia	65.7	74.9	77.7	86.1
Middle East/North Africa	76.9	83.8	80.6	88.0
Latin America/Caribbean	85.6	90.2	92.4	95.6
High-Income Non-OECD	90.3	93.6	90.6	94.4
Eastern Europe/Central Asia	92.1	94.8	93.7	96.3
High-Income OECD	96.7	97.8	98.1	98.9
East Asia/Pacific	98.1	98.8	94.9	97.0

Table 13: Gender ratio in net primary enrollment: Out-of-sample predictive power of the S-curve

Fem./Male primary enrollment	Actual	Predicted	Actual	Predicted
In year	1990	2000	2000	2015
Uses data available in	—	1990	—	2000
Sub-Saharan Africa	79.9	88.1	85.9	93.2
South Asia	77.9	86.8	90.0	95.3
Middle East/North Africa	84.4	91.0	91.4	96.0
Latin America/Caribbean	99.3	99.6	98.0	99.1
High-Income Non-OECD	98.2	99.0	98.5	99.3
Eastern Europe/Central Asia	99.2	99.6	98.4	99.3
High-Income OECD	100.2	—	99.7	99.9
East Asia/Pacific	94.7	97.1	97.2	98.8

Table 14: Case studies in policy and outcomes: Best practice or bubble?

Country	UNESCO-reported Net prim. enrollment (year) From	To	Spending per primary student, % GDP/cap.	Public educ. spending, % GDP	Primary pupils/ teacher
Typical					
Bolivia	75.5 (1975)	97.1 (1998)	12.0	4.6	25.1
Brazil	69.8 (1970)	97.0 (2000)	11.8	4.1	23.8
Ecuador	73.0 (1965)	96.9 (1996)	5.6	2.6	27.2
Paraguay	76.0 (1960)	92.1 (2000)	6.9	3.4	23.1
Swaziland	62.3 (1970)	92.8 (2000)	8.5	6.3	33.0
Syria	66.0 (1965)	96.3 (2000)	12.9	3.5	23.9
Tunisia	75.5 (1970)	95.8 (1992)	—	5.4	35.0
Stagnation					
Iran	80.9 (1985)	73.6 (2000)	8.3	4.5	29.9
Kenya	88.0 (1975)	68.5 (2000)	11.6	6.6	30.6
Tanzania	67.8 (1980)	46.7 (2000)	—	2.5	37.1
Venezuela	81.0 (1960)	83.8 (1996)	3.0	4.4	22.2
Rapid rise?					
Malawi	49.7 (1990)	100.6 (2000)	7.0	4.2	62.8
Rwanda	65.9 (1990)	97.3 (2000)	6.9	2.6	55.1
Togo	60.5 (1985)	92.3 (2000)	8.8	5.0	48.9
Uganda	48.0 (1993)	109.5 (2000)	7.7	2.1	38.2
Botswana	75.6 (1980)	93.3 (1990)	6.8	5.7	32.2
Indonesia	72.4 (1975)	98.1 (1985)	—	2.1	29.1
World average			14.0	4.5	27.5
LDC average			13.3	4.5	30.8

Note: In late 2003, UNESCO issued a revised set of estimates for net primary enrollment in the years 1998-2001 only. Since revised estimates were not issued for earlier years, this study uses the pre-revision estimates of enrollment during 1998-2001 in order to strive for comparability with the pre-1998 figures. This decision is discussed in detail in the appendix. The post-revision changes relevant to this table do not affect the table's qualitative message and are confined to five changes—two of which differ from the pre-revision estimate by 1% or less, and two of which changed the previous estimate to a missing observation. These post-revision figures are: Bolivia (1998) 98; Syria (2000) 95; Malawi (2000) *no data*; Togo (2000) 91; and Uganda (2000) *no data*.

Figure 5: What it would take to meet the net primary enrollment goal

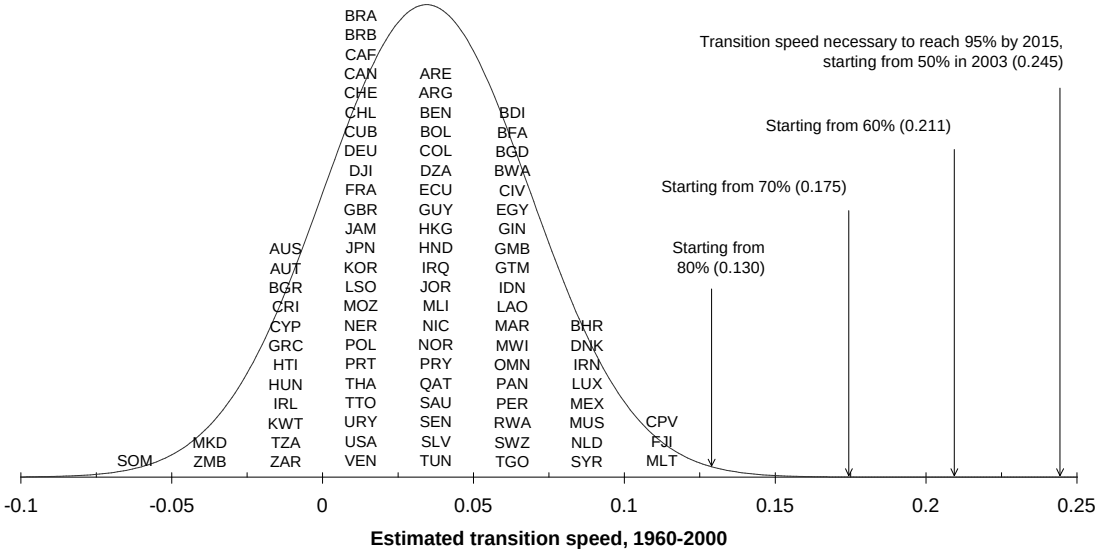


Table 15: Examples of country-specific, historically-grounded education goals

Income	Enrollment	Gender ratio	Example	GDP/cap. $PPP 2000	Net prim. enrollment 2000	*2015*	Gender ratio, prim. 2000	*2015*
Lower	Lower	Lower	Niger	750	30	*45*	68	*83*
Lower	Higher	Lower	Benin	1,000	70	*85*	69	*84*
Higher	Lower	Higher	Saudi Arabia	11,400	58	*71*	96	*98*
Higher	Higher	Higher	Namibia	6,400	82	*89*	100	—
Medium	Higher	Lower	India	2,400	86	*92*	83	*92*
Medium	Medium	Lower	Morocco	3,600	74	*84*	87	*94*

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A Appendix: UNESCO's 2003 data revision

During the course of 2003, the UNESCO Institute of Statistics (UIS) revised its latest estimates of net primary enrollment in 1998 to 2001 as part of its ongoing process of working with its member governments to correct errors in reported statistics. Among the changes was that of what UIS described as 'capping' net enrollment rates over 100%, that is, the data are censored from above at 100%; several other types of corrections were also made. The estimates in this paper use quinquennial data, so only one observation (the year 2000) is affected by the change. This presents a research dilemma: 1) use the pre-revision estimates for 2000 in order to assure comparability with the data from 1995 and before, or 2) replace the previous estimates for 2000 with the revised estimates?

The choice was made in this study to use the pre-revision estimates for 2000 in the regression analysis. This is justified by several considerations:

First, estimates of the transition speed in Table 4 and Figure 1 depend entirely on time series dynamics, so it is important to strive for comparability across time wherever possible. Net primary enrollment figures currently available from UNESCO for the years 1995 and before do not comply with the same standard used to revise the 1998-2001 numbers. Thus if the number of students enrolled in primary school in Mexico increased between 1990 and 2000, but the census in both years underestimated the total number of children in the appropriate age group so that both the 1990 and 2000 figures exceeded 100%, then leaving these figures uncensored would allow the enrollment increase to be reflected in the regression results whereas censoring both at 100% would hide this increase.

Second, for the vast majority of countries, the divergence between the pre-revision and post-revision estimates of 2000 net primary enrollment is small, as Figure 6 shows.

Third, the mean of the difference between the two estimates for 143 countries in the year 2000 is -0.914 (significantly less than zero at the $<1\%$ level) with a standard deviation of 3.32, represented in Figure 7. That is, the pre-revision estimates typically *overestimated*, to a small degree, net primary enrollment in the year 2000. Replacing the pre-revision estimates with the post-revision estimates could only, therefore, *decrease* the estimated transition speed. Thus all qualitative conclusions regarding the remarkable slowness of the transition would be unaffected were the revised data to be used.

Fourth, any measurement error introduced by using pre-revision enrollments instead of post-revision enrollments would not decrease the transition speed estimates via standard attentuation bias since the error is in the regressand, not the regressor, of equation (5).

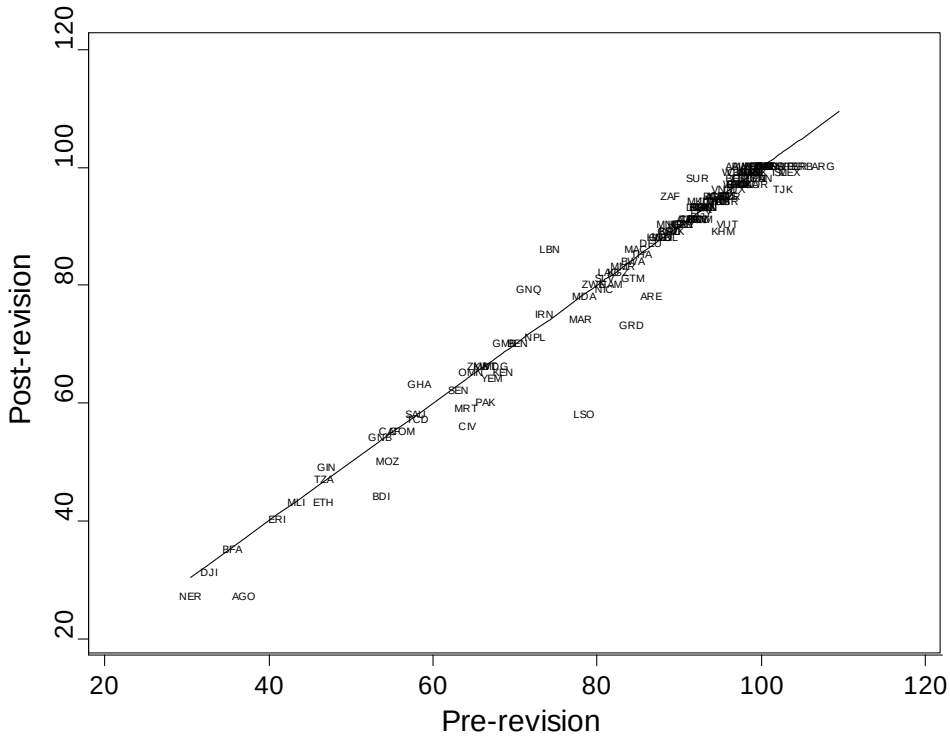
B Appendix: Enrollment vs. completion

The second Millennium Development Goal is that "by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling" (UN 2001). The net enrollment fraction is not exactly equal to the fraction of children who complete primary school. The latter can, however, serve as an upper bound on the former. Thus a country that requires until the year 2030 to reach 90% net primary enrollment can only reach 90% primary completion at some point *later* than 2030. The analysis of Table 4 can then be understood as a lower bound on the time of transition to primary completion. This can be demonstrated both theoretically and empirically.

Proposition 1 *The percent of each age cohort completing each grade of primary school (P^c) must be less than percent net primary enrollment in all grades up to and including that grade (P^e).*

Proof. *Let $0 \leq f_{g,t} \leq 1$ be the fraction of those who completed grade $g-1$ in year $t-1$ who complete grade g in year t and enroll in grade $g+1$. Let $f_{0,t}$ be the net intake rate to first grade among children of age to do so. The fraction of the age cohort that completes grade k in year t is $P^c_{k,t} \equiv \prod_{i=0}^{k} f_{i,t-k+i}$. Net enrollment in grades 1 through k during the school year that ends in year t*

Figure 6: Net primary enrollment in the year 2000, before and after the 2003 UNESCO data revision



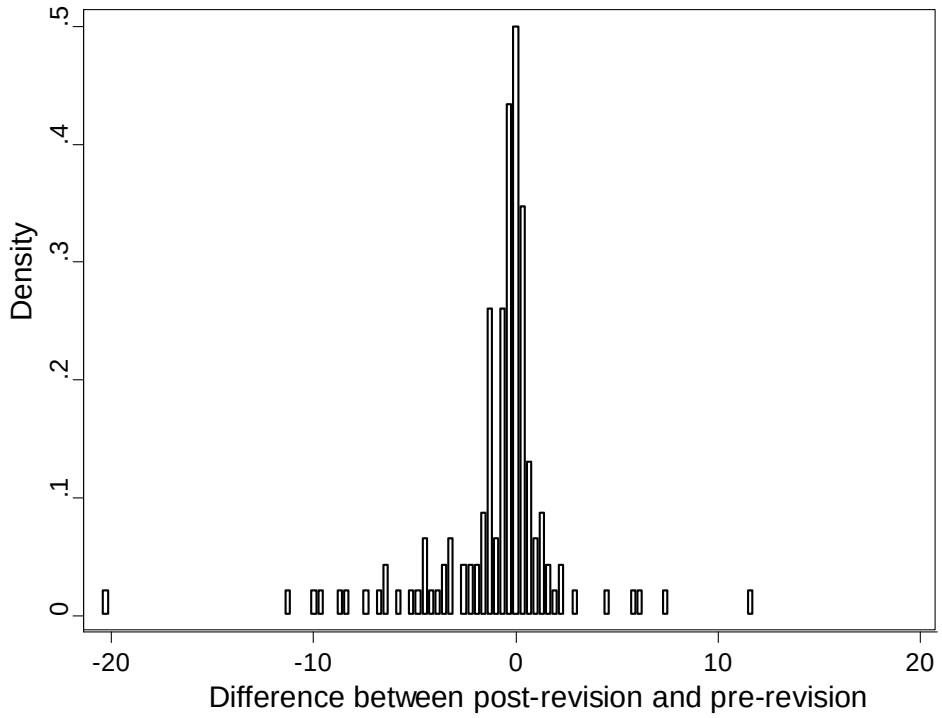
is $P^e_{k,t} \equiv (1/k)\sum_{j=0}^{k-1} P^c_{j,t}$. *Assuming* k *is small enough that* $f_{0,t-k} \approx f_{k,t} \forall k$, *which is to say that attrition rates do not change too rapidly over time, then we have* $P^e_{k,t}/P^c_{k,t} = \sum_{i=0}^{k} \left(\prod_{j=0}^{i} f_{k-j,t}\right)^{-1} > 1$ $\forall\ k \geq 2$. ■

This relationship is easliy seen empirically as well. Figure 8 uses figures on net intake rate in grade 1 and persistence rate to grade 5 from the World Bank's *World Development Indicators* to construct a measure of the fraction of each age cohort completing primary school. It then compares these figures to net primary enrollment, with a 45° line added for reference.

C Appendix: Comparing transition rates from enrollment figures in different units

School enrollments for the period 1865-1914 are in units of total population enrolled in primary school of any age divided by number of people under age 15 in the larger population. Call this "modified gross enrollment." Net primary enrollment is measured in units of number of children of school age enrolled in primary school divided by number of people in the larger population that are of school age. Thus we can define the relationship between modified gross enrollment (s_{mg}) and net enrollment (s_n) as $s_{mg} \equiv (\theta_1/\theta_2)\, s_n$, where θ_1 is one plus the fraction of enrollees who are older than school age, and θ_2 is one plus the fraction of people under age 15 who are not of school age (such

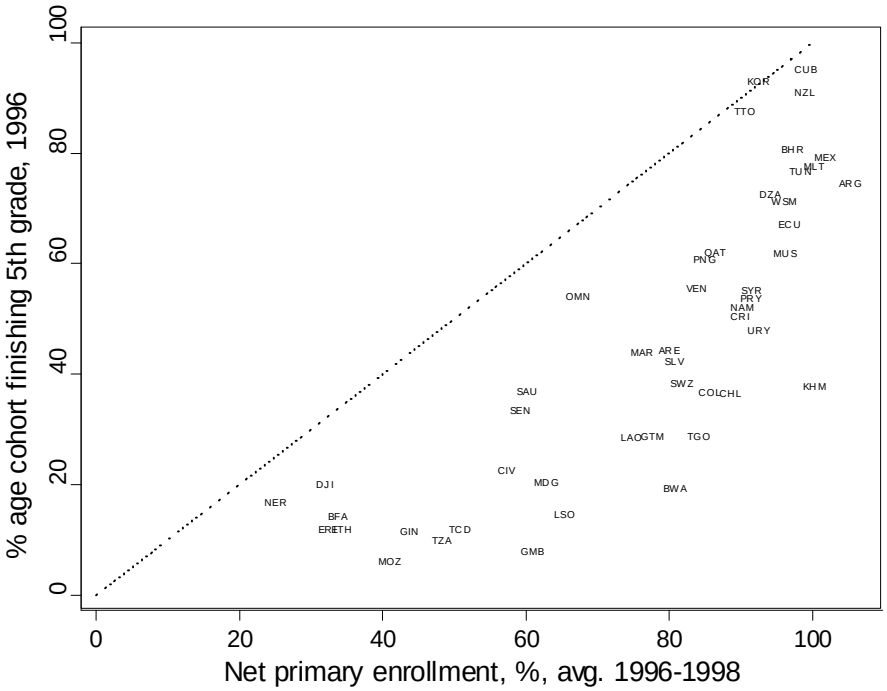
Figure 7: Histogram of the difference between post-revision and pre-revision estimates of net primary enrollment in the year 2000



as infants). The rate of change of s_{mg} is thus $\dot{s}_{mg}/s_{mg} = \dot{s}_n/s_n + \dot{\theta}_1/\theta_1 - \dot{\theta}_2/\theta_2$ which by equation (5) is equal to $a\left(s_{\max} - s\right) + \dot{\theta}_1/\theta_1 - \dot{\theta}_2/\theta_2$. Thus estimates of the transition speed a obtained from using s_{mg} and $s_{\max} = 62\%$ are comparable to estimates of a obtained from s_n and $s_{\max} = 101\%$ if and only if $\dot{\theta}_1/\theta_1 - \dot{\theta}_2/\theta_2 = 0$, of which a case is $\dot{\theta}_1/\theta_1 = \dot{\theta}_2/\theta_2 = 0$.

In other words, if the age structure of those who typically attend school and the age structure of the larger population change very slowly over time, estimates of a derived from s_{mg} are comparable to those derived from s_n. Aside from New Zealand and Ceylon, the rate of population growth was not changing fast enough in the 35 countries examined during 1865-1914 for a panel regression of population growth on time to yield a statistically significant coefficient (results not reported). This at least suggests that $\dot{\theta}_2/\theta_2$ was small. If $\dot{\theta}_1/\theta_1$ was large, this would place an *upward* bias on estimates of a using s_{mg}, making the results in Table 5 an upper bound on the transition speed for net primary enrollment at that time. Any such bias would thus only reinforce the conclusion that the typical transition speed for net primary enrollment during 1865-1914 was slower than during 1960-2000.

Figure 8: Enrollment can serve as an upper bound on completion



D Appendix: Data

D.1 School enrollment, post-1950

All net primary enrollment data (for females and males combined) and gross primary enrollment data (for females and males separately) after 1950 come originally from UNESCO. Data for 1970-1995 are taken from the World Bank's *World Development Indicators* 2002 CD-ROM, which lists its source as UNESCO. Data for 2000, with which the World Bank database has not yet been updated, come from the UNESCO Institute for Statistics online education database at http://www.uis.unesco.org. Limited data on net primary enrollment for 1950-1965 come from the *UNESCO Statistical Yearbook 1972*, Table 2.7, pp. 92-113. Data on gross primary enrollment broken down by gender come from the *UNESCO Statistical Yearbook 1970*, Table 2.5, pp. 80-109.

Primary education is defined in the sources as that which "provides children with basic reading, writing, and mathematics skills along with an elementary understanding of such subjects as history, geography, natural science, social science, art, and music." The gross enrollment ratio is defined as "the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown." Net enrollment is defined as "the ratio of the number of children of official school age (as defined by the national education system) who are enrolled in school to the population of the corresponding official school age," and is "based on the International Standard Classification of Education, 1976 (ISCED76) and 1997 (ISCED97)."

Solely in the case of gender-segregated gross enrollment data for 1950-1965, a minor calculation was necessary. The 1970 *Yearbook* provides data on gross enrollment for females and males combined (s_{tot}), as well as for females only (s_f), but not for males only. The ratio of interest to Table 7 can be

proxied with $s_f/s_m \approx (2\,(s_{tot}/s_f) - 1)^{-1}$, assuming that school-age cohorts in the greater population contain roughly equal numbers of girls and boys.

D.2 School enrollment, pre-1914

Data for pre-1914 primary enrollment as a fraction of the total population in Argentina, Brazil, Burma (Myanmar), Ceylon (Sri Lanka), China, Egypt, France, Germany, India, Netherlands Indies (Indonesia), Italy, Japan, Mexico, the Philippines, Russia, Serbia (Yugoslavia), Spain, Siam (Thailand), the Anatolian portion of the Ottoman Empire (Turkey), and the United States are from Richard A. Easterlin (1981), "Why Isn't the Whole World Developed?" *Journal of Economic History*, 41(1)(March):1-19., and Richard A. Easterlin (1996), *Growth Triumphant* (Ann Arbor: University of Michigan Press), p. 61. Data for Austria-Hungary (Austria), Australia, Canada, Chile, Colombia, Denmark, Greece, Norway, Peru, Portugal, Sweden, and Uruguay are from Arthur S. Banks (1976), *Cross-National Time Series*, 1815-1973 [Computer File], ICPSR ed. Ann Arbor, MI: Inter-University Consortium for Political and Social Research [producer and distributor] and Arthur S. Banks (1971), *Cross-Polity Time Series Data* (Cambridge, MA: MIT Press).

Data for New Zealand come from G. T. Bloomfield (1984), *New Zealand: A Handbook of Historical Statistics* (Boston: G. K. Hall & Co.), p. 110. Data for Cuba come from Susan Schroeder (1983), *Cuba: A Handbook of Historical Statistics* (Boston: G. K. Hall & Co.). Data for Colombia are estimated based on José Antonio Ocampo, et al. (1997), *Historia Económica de Colombia* (Bogotá: Presidencia de la República), pp. 160-1, and Gabriel Poveda Ramos (1979), *Dos Siglos de Historia Económica de Antioquia* (Medellín: Biblioteca Pro Antioquia), p. 95. Data for Ceylon (Sri Lanka) come from Colonial Secretary's Office (1914), *Ceylon Blue Book* (Colombo: H.C. Cottle Government Printer), front endsheet.

To obtain primary enrollment as a fraction of the population below age 15, the above figures for primary enrollment as a fraction of the total population were divided by the fraction of the population below age 15. This latter statistic was gathered as follows:

Data for fraction of the population below age 15 (the "youth dependency ratio") for Argentina, Australia, Austria-Hungary, Brazil, Burma, Canada, Denmark, France, Germany, Greece, India, Italy, Japan, Mexico, Norway, Portugal, Russia, Spain, Sweden, and the United States come from the appropriate volume of B. R. Mitchell (1981), *European Historical Statistics*, 2nd rev. ed., Macmillan, London; B. R. Mitchell (1998), *International Historical Statistics, Africa, Asia & Oceania*, 3rd ed., St. Martin's Press, New York; or B. R. Mitchell (1998), *International Historical Statistics, The Americas*, 4th ed., St. Martin's Press, New York. Figures for Chile are from Markos J. Mamalakis (1989), *Historical Statistics of Chile*, Vol. 2, Greenwood Press, New York. Figures for Ceylon are approximated using a straightforward demographic model employing population growth figures from the 1914 Ceylon Blue Book op. cit., and viable birth and infant mortality statistics from L. J. B. Turner (1923), *Report on the Census of Ceylon 1921* (Colombo: H. Ross Cottle, Government Printer), pp. 11, 15.

Youth dependency ratio statistics for China are gathered from a range of sources, giving a picture of trends in the ratio from 1771 to 1990. Data for 1771-1835 and 1872 are from Ping-ti Ho (1959), *Studies on the Population of China 1368-1953*, Harvard University Press, Cambridge, Mass., pp. 59, 68. A benchmark from 1842 is in Gilbert Rozman (1982), *Population and Marketing Settlements in Ch'ing China*, Cambridge University Press, 1982, p. 59. A figure from 1953 is in S. Chandrasekhar (1960), *China's Population: Census and Vital Statistics*, Hong Kong University Press, Hong Kong, p. 47, and figures from 1953, 1964, and 1982 are in Li Chengrui (1992), *A Study of China's Population*, Foreign Languages Press, Beijing. A datapoint for 1958 is in Chai Sunglin (1977), *Population and Population Policy in Mainland China*, Asia and the World Forum, Monograph 6, Taipei, Taiwan, p. 56. Benchmarks for 1926, 1929, 1931, 1934, and 1947 are in Yang Zi Hui (1995), *China Historical Population Data and the Relevant Studies*, China Reform Publishing House, Beijing, pp. 1364, 1366, 1369. The general agreement of these disparate figures on long-term trends in the population

structure allows confident interpolation for 1870-1914.

Youth dependency data for Colombia come from Mitchell op. cit. 1998, Ocampo 1997 op. cit. p. 160, and Poveda op. cit. p. 95. Data for Cuba are from Schroeder, op. cit., pp. 51-3. A benchmark for Egypt in 1917 is from Mitchell 1998 op. cit., and in preceding years the Egyptian youth dependency ratio is assumed to change at the same rate as that of India. Data for Indonesia are from Boomgaard and Gooszen, op. cit. pp. 200-3. Figures for New Zealand are in Bloomfield op. cit., pp. 48-50. Peruvian figures for 1876 are benchmarked in Alida Díaz (1974), *El Censo General de 1876 en el Perú*, Seminario de Historia Rural Andina, Lima, Table 8, page 33. These are compared with post-1940 statistics in Mitchell 1998 op. cit. to reveal long-term trends in the Peruvian population structure. For the Philippines, there is a 1918 benchmark in Felipe Buencamino, Sr. (1921), *Census of the Philippine Islands*, Vol. 2, Census Office of the Philippine Islands, Manila, p. 65, and a 1903 benchmark in J. P. Sanger (1905), *Census of the Philippine Islands*, Vol. 2, United States Bureau of the Census 1905, p. 65. Serbian data come from Holm Sundhaussen (1989), *Historiche Statistik Serbiens 1834-1914*, R. Oldenbourg Verlag, Munich p. 114. Data for Thailand in 1911, 1925, 1947, and 1960 come from the *Statistical Year Book of the Kingdom of Siam* published by the Ministry of Finance, and data points for 1929 and 1937 are in Mitchell 1998 op. cit. Together these give a clear view of long-term trends in the Thai population structure that allow confident extrapolation to the period 1870-1913. For Turkey, an 1886 benchmark can be found in Justin McCarthy (1982), *The Arab World, Turkey, and The Balkans (1878-1914): A Handbook of Historical Statistics*, G. K. Hall & Co., Boston, p. 87, and comparison points for 1935-1960 are in Mitchell 1998 op. cit., giving a clear picture of long-term trends in Turkish demographic structure. Uruguayan dependency ratios for 1900 and 1908 are in Mitchell 1998 op. cit., and before 1900 they are assumed to have changed at the same rate as did those for Argentina.

D.3 Additional data

Data on GDP per capita at Purchasing Power Parity, percent of national income devoted to education expenditure, ratio of primary pupils to teachers, urbanization, fraction of value-added in the manufacturing and agricultural sectors, female lifetime fertility, and fraction of the labor force that is female come from the World Bank's World Development Indicators 2003 CD-ROM. Data for education Gini coefficients come from Vinod Thomas, Yan Wang, and Xibo Fan (2001), "Measuring Education Inequality: Gini Coefficients of Education," Policy Research Working Paper 2525 (Washington, DC: World Bank), whose dataset is available at http://www.worldbank.org/devforum/files/Ginidata.xls. Fraction of the adult (age 15+) population with primary, secondary, and higher education complete is from Robert Barro and Jong-Wha Lee (2000), "International Data on Educational Attainment Updates and Implications," Working Paper 7911 (Cambridge, MA: National Bureau of Economic Research), whose dataset is available at http://www.cid.harvard.edu/ciddata/ciddata.html. Fraction of the national legislature that is female comes from UNIFEM (2002), *Progress of the World's Women 2002* (New York: United Nations), Table 7, p. 43. Fraction of the population of different religions in 1970 comes from David B. Barrett, George T. Kurian, and Todd M. Johnson (2001), *World Christian Encyclopedia* (New York: Oxford University Press), Vol. 1. Classifications of certain countries as "socialist" are given in Janos Kornai (1992), *The socialist system : the political economy of communism* (Princeton, N.J.: Princeton University Press).

E Appendix: Past development goals

Information for Tables 1 and 2 was gathered from the following sources.

E.1 Universal primary education

E.1.1 No goal year

The Geneva 1934 meeting is discussed in UNESCO [1979], *International Conference on Education: Recommendations 1934-1977* [Paris: United Nations Educational, Scientific and Cultural Organization], p. 1. The Universal Declaration of Human Rights, adopted by the United Nations in New York in 1948, states in Article 26: "Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory." In 1951, meeting again in Geneva, the International Conference on Public Education, recommended: "Plans for the full enforcement of compulsory education, in the spirit of Article 26 of the Universal Declaration of Human Rights adopted on the 10th December, 1948, should be drawn up without delay in those countries where the problem arises" (UNESCO [1979] op. cit., p. 87).

In 1951, UNESCO planned a series of regional conferences on free and compulsory education. The first was the Regional Conference on Free and Compulsory Education in South Asia and the Pacific, held in Bombay in 1952. UNESCO member states in the region were "invited to draw up during 1953 and 1954 their long-term general plans for the extension of free and compulsory education" (UNESCO [1954], *Compulsory Education in South Asia and the Pacific: Report of the Bombay Conference*, December 1952 [New York: United Nations], p. 135).

Similar meetings for the Middle East and Latin America likewise discussed the goal without setting a specific date. These were the UNESCO Conference on Free and Compulsory Education in the Arab Countries of the Middle East, held in Cairo in 1954, and the UNESCO Regional Conference on Free and Compulsory Education in Latin America (MINEDLAC I), held in Lima in 1956. ("Because of the unwillingness of the Arab states to join with Israel in an international gathering, this conference was not organized by Unesco but by Egypt. However, Unesco provided some technical services." H. C. Laves and Charles A. Thomson [1957], *UNESCO: Purpose, Progress, Prospects* [Bloomington, IN: Indiana University Press], p. 387)

E.1.2 Goal year 1980

The UNESCO Regional Meeting of Representatives of Asian Member States on Primary and Compulsory Education took place in Karachi, Pakistan from December 28th 1959 to January 9th 1960. The Karachi meeting set the ambitious goal of universal primary education (seven years) throughout the region by the year 1980. Similar UNESCO meetings for Africa, Latin America, and the Middle East produced a goal of universal primary education by 1980 for those regions. These were the Conference of African States on the Development of Education in Africa, which was held in Addis Ababa in 1961 and produced the "Addis Ababa Plan," and the Conference of Ministers of Education and Those Responsible for Economic Planning, which occurred in Santiago, Chile in 1962 and produced the "Santiago Plan," and the Conference of Ministers of Education and Ministers Responsible for Economic Planning in the Arab States, held in Tripoli in 1966.

In Tokyo in 1962, the Karachi Plan was modified to take a more "flexible" approach to the 1980 goal: "We have heard and examined the reports from the 18 Asian States, and have been impressed with the resolute efforts of these countries to implement the Karachi Plan, during the two years which have elapsed since its formulation. Although we are at various stages of educational and economic development, most of us hope to achieve the target of at least seven years of primary education by 1980, some of us will achieve it earlier, while others will complete a first phase of 4-5 years compulsory schooling within this decade. Under the circumstances educational and economic prevailing in our countries, this flexible approach and application of the Karachi decisions to our countries is considered a wise procedure." (UNESCO [1962], *op. cit.*, paragraph 1).

In 1966, UNESCO issued a follow-up report on the Karachi Plan, including projections of educational attainment in Asia over the following decade and a half (UNESCO [1966], An Asian model of educational development: Perspectives for 1965-80 [Paris: UNESCO]). While several governments

in the region had prepared national plans for implementing the Karachi Plan, some had not, and most others had plans that departed to varying degrees from the numbers in the Karachi Plan. India's goal was 100% enrollment for the 6-11 age group by 1976; Pakistan's was 100% enrollment in grades 1-5 by 1985; Afghanistan's was 50% primary enrollment by 1980; the Phillippines' was 90% enrollment of 7 year-old children by 1980; Burma's was 100% primary enrollment by 1970; Iran's was 100% of the age 7-13 age-group by 1983; and Laos and Nepal had no national plans (pp. 22-23). The implicit recognition was that Afghanistan, Laos, and Nepal would certainly not meet the Karachi Plan goal.

In 1970 the UN General Assembly adopted the International Development Strategy for the Second UN Development Decade, which lists among the goals of the decade "achieving enrolment of all children of primary school age" (Resolution 2626 XXV, Document A/8124 and Add. 1, paragraph 18[b]).

E.1.3 Goal year 2000

On December 4-13, 1979, the UNESCO Conference of Ministers of Education and Those Responsible for Economic Planning of Member States in Latin America and the Caribbean, held in Mexico City, recommended to the member states in its Final Report "that they make a specific endeavour to bring about full and effective exercise of the right to education and to ensure that all children receive education of the requisite duration and quality so that illiteracy may be eradicated before the end of the present century..." In 1980, the UN issued its International Development Strategy for the Third UN Development Decade in New York, stating the goal of "the closest possible realization of universal primary enrolment by the year 2000" (General Assembly Resolution A/RES/35/56 Annex, paragraph 46).

In 1985, the 23rd UNESCO General Conference in Sofia approved its "Plan of action to eradicate illiteracy by the year 2000." These goals were reaffirmed in 1990, when the World Conference on Education for All in Jomtien, Thailand stated that "countries may wish to set their own targets for the 1990s in terms of the following proposed dimensions: ... Universal access to, and completion of, primary education (or whatever higher level of education is considered as 'basic') by the year 2000" (World Conference on Education for All: Meeting Basic Learning Needs [1990], *Framework for Action to Meet Basic Learning Needs, adopted March 5-9 in Jomtien, Thailand*, paragraph 8).

At the UNESCO Sixth Conference of Ministers of Education and Those Responsible for Economic Planning in African Member States, held Dakar, Senegal in 1991, the ministers recommended a sliding scale of education goals for different countries, including "adoption of national strategies that differ according to the degree of development of basic education, with a view to achieving the goals of the global strategy: countries with a net enrolment ratio of less than 40 per cent would aim at doubling that ratio; countries with a net enrolment ratio of between 40 and 49 per cent would aim at a target of 75 per cent; countries with a net enrolment ratio of between 50 and 70 per cent would aim at a target of 80 per cent; the other countries would aim at universal school enrolment" (Final Report, Paragraph 5).

In December 1993, representatives of some of the most populous developing countries (Bangladesh, Brazil, China, Egypt, India, Indonesia, Mexico, Nigeria, and Pakistan) met in Delhi at the Education for All Summit of Nine High-Population Countries to launch the "E-9 Initiative." They reaffirmed their interest in "the commitment to the goal of education for all and in intensifying their efforts to achieve it by the year 2000 or at the earliest possible moment" (UNESCO [1994], The Delhi Declaration and Framework for Action, paragraph 4.3)

E.1.4 Goal year 2015

In 1995 the United Nations' Fourth World Conference on Women issued its Beijing Declaration and Platform for Action, where "strategic objective" B1 calls for: "By the year 2000, universal access to basic education and completion of primary education by at least 80 per cent of primary school-age

children" as well as "universal primary education in all countries before the year 2015" (paragraph 82[b]).

On May 6-7, 1996, the 34th High Level Meeting of the OECD Development Assistance Committee—representing all major donor nations—adopted a report entitled *Shaping the 21st Century: The Contribution of Development Co-operation*. This document was the first attempt to collect in one place a set of quantitative development goals embracing poverty, education, child health, and environment that had been discussed at several different international meetings, and was accompanied by a promise of "adequate resources" for achieving the targets (p. 2). These goals included "universal primary education in all countries by 2015."

The largest-ever gathering of heads of state occurred in New York City in the year 2000. There, at the Millennium Summit, 147 presidents, prime ministers, and monarchs unanimously issued the Millennium Declaration, in which the leaders "resolve ... by the year 2015 ... to ensure that ... children everywhere, boys and girls alike, will be able to complete a full course of primary schooling" (United Nations [2000], *United Nations Millennium Declaration*, General Assembly resolution A/RES/55/2 [New York: UN], paragraph 19).

The office of the Secretary General proposed in September of the following year a set of Millennium Development Goals, of which "goal 2" and "target 3" is: "Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling" (United Nations [2001], Road map towards the implementation of the United Nations Millennium Declaration, General Assembly document A/56/326 [New York: UN], p. 56).

E.2 Gender parity in education

E.2.1 No goal year

In 1920-1 and again in 1923-24, the Phelps-Stokes Fund in New York launched what may have been the first development "missions" to Africa. A team of US, British, and South African government officials, Christian church officials, and African academics traveled throughout several Sub-Saharan Africa to make a country-by-country assessment of existing systems of basic and higher education. Their revolutionary final reports, Education in Africa and Education in East Africa, were among the first prominent documents to advocate colonial government provision of mass education for "Natives"—on a continent where this responsibility was largely shouldered by religious missions where it was accepted at all. The reports emphasized that mass education should be provided to girls and boys in equal measure, though it did not specify any timeline for this goal. "The discussions of educational objectives and adaptations, of supervision and administration, bear with equal directness on the education of women and men. ... It is essential for the future welfare of Africa that the education of men and women, of boys and girls, should be parallel and simultaneous" (Thomas Jesse Jones [1923], *Education in East Africa: A Study of East, Central, and South Africa by the second African Education Commission under the auspices of the Phelps-Stokes Fund, in cooperation with the International Education Board* [New York: Phelps-Stokes Fund], p. 339, 349).

The UNESCO Convention against Discrimination in Education of 1960, which entered into force in 1962, specifies "sex" as one of many bases of discrimination and in Article 4 calls for the parties to "formulate, develop and apply a national policy which, by methods appropriate to the circumstances and to national usage, will tend to promote equality of opportunity and of treatment in the matter of education and in particular ... to make primary education free and compulsory; make secondary education in its different forms generally available and accessible to all." It sets no date for reaching this goal.

UN Declaration on the Elimination of Discrimination against Women (General Assembly resolution 2263 [XXII] of 7 November 1967) in Article 9 pledges: "All appropriate measures shall be taken to ensure to girls and women, married or unmarried, equal rights with men in education at all levels." No date is set for meeting this goal.

E.2.2 Goal year 1980

"The achievement of the following should be envisaged as a minimum by the end of the first five-year period (1975-1980): ... Equal access at every level of education, compulsory primary school education..." Para 46(c), p. 192, Report of the World Conference of the International Women's Year, held in Mexico City from 19 June to 2 July 1975; including the Agenda, the World Plan of Action for the Implementation of the Objectives of the International Women's Year, and the Declaration of Mexico on the Equality of Women and Their Contribution to Development and Peace, and resolutions and decisions adopted by the Conference, E/CONF.66/34, 1976, in United Nations (1996), The United Nations and the Advancement of Women: 1945-1996 (New York: UN), pp. 187-211.

E.2.3 Goal year 1995

"Although the World Plan of Action for the Implementation of the Objectives of the International Women's Year already contains a comprehensive list of measures necessary to achieve those objectives, it is evident, and has been further borne out by the review of progress made over the past five years, that they cannot be achieved in such a short span of time... Therefore, the possibility of a second decade could be envisaged for the period 1985-1995." (para 9, pp. 252-3). "Governments should undertake the following: The establishment of qualitative and quantitative targets for the second half of the United Nations Decade for Women: Equality, Development, and Peace; projections for the planning cycles of 1985-1995 should be made where appropriate, and reviews conducted in 1985 and 1990. These should especially seek to remove the gap between the attainments of men and women ... in all sectors and particularly in the fields of employment, health, and education." (Report of the World Conference of the United Nations Decade for Women: Equality, Development, and Peace, held in Copenhagen from 14 to 30 July 1980; including the Agenda, Programme of Action for the Second Half of the United Nations Decade for Women and resolutions adopted by the Conference (extract), para 51(a), p. 259, A/CONF.94/35, in United Nations (1996), The United Nations and the Advancement of Women: 1945-1996 (New York: UN), pp. 250-284.

E.2.4 Goal year 2000

"Special measures should be taken by Governments and the international organizations, especially UNESCO, to eliminate the high rate of illiteracy by the year 2000, with the support of the international community. ... While the elimination of illiteracy is important to all, priority programmes are still required to overcome the special obstacles that have generally led to higher illiteracy rates among women than among men." (para 164, p. 333) Note that para. 35 (p. 317) also stresses that the goals of the 1975 World Plan of Action and the 1980 Programme of Action remain in effect and "constitute the basis for the strategies and concrete measures to be pursued up to the year 2000" (Report of the World Conference to Review and Appraise the Achievements of the United Nations Decade for Women: Equality, Development and Peace, held in Nairobi from 15 to 26 July 1985; including the Agenda and the Nairobi Forward-looking Strategies for the Advancement of Women (extract), A/CONF.116/28/Rev.1, 1986, in United Nations [1996], The United Nations and the Advancement of Women: 1945-1996 [New York: UN], pp. 310-362).

At the UNICEF/UNESCO Pan-African Conference on the Education of Girls in Ouagadougou in 1993, the Ouagadougou Declaration called upon governments "of those countries in which the disparity between boys and girls in school is more than 10 per cent of the target population to eliminate such disparities by the year 2000" (UNESCO/UNICEF and Government of Burkina Faso [1993], The Education of Girls–The Ouagadougou Declaration and Framework for Action, Pan-African Conference on the Education of Girls, March-April).

E.2.5 Goal year 2005

In1995 the United Nations' Fourth World Conference on Women issued its Beijing Declaration and Platform for Action, where "strategic objective" B1 calls for "closing the gender gap in primary and secondary school education by the year 2005" (paragraph 82[b]).

On May 6-7, 1996, the 34th High Level Meeting of the OECD Development Assistance Committee—representing all major donor nations—adopted a report entitled Shaping the 21st Century: The Contribution of Development Co-operation. This document was the first attempt to collect in one place a set of quantitative development goals embracing poverty, education, child health, and environment that had been discussed at several different international meetings, and was accompanied by a promise of "adequate resources" for achieving the targets (p. 2). These goals included "eliminating gender disparity in primary and secondary education by 2005."

E.2.6 Goal year 2015

The largest-ever gathering of heads of state occurred in New York City in the year 2000. There, at the Millennium Summit, 147 presidents, prime ministers, and monarchs unanimously issued the Millennium Declaration, in which the leaders "resolve ... by the year 2015 ... to ensure that ... children everywhere, boys and girls alike, will be able to complete a full course of primary schooling and that girls and boys will have equal access to all levels of education" (United Nations [2000], United Nations Millennium Declaration, General Assembly resolution A/RES/55/2 [New York: UN], paragraph 19).

The office of the Secretary General proposed in September of the following year a set of Millennium Development Goals, of which "goal 3" and "target 4" is: "Eliminate gender disparity in primary and secondary education, preferably by 2005, and to [sic] all levels of education no later than 2015" (United Nations [2001], Road map towards the implementation of the United Nations Millennium Declaration, General Assembly document A/56/326 [New York: UN], p. 56).

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