Apples and oranges: Educational enrollment and attainment across countries in Latin America and the Caribbean

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Abstract

This paper uses household survey data to rank LAC countries' performance in two areas: (i) getting children into school on time and keeping them there, and (ii) turning their contact with the educational system into years of schooling. It presents multiple rankings because most countries' performance is not uniform across these dimensions. For instance, the Dominican Republic performs almost as well as the richest countries when it comes to keeping children in school, but as badly as the poorest few in terms of turning attendance into years of schooling. Further, the rankings, which are based on conventional and new measures of educational systems' performance, are occasionally quite different from those obtained using more widely available administrative data.
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1. Introduction

Which countries are closer to achieving the goals of universal enrollment in primary and/or secondary school? Which have done best at maintaining educational quality, even as they increase enrollments? Such questions are of particular relevance when countries set themselves common objectives in these areas, such as they did in adopting the "Millennium Development Goals" (MDGs), which aim for universal primary education—every child finishing primary school—by 2015.[1]

From a policy perspective, a key issue is what costs reaching this goal will entail. Glewwe and Zhao (2005) for instance, review a debate that considers aspects such as: to what extent this goal will be met simply through economic growth, how much considering repetition affects cost estimates, and whether increased educational supply (without demand-side subsidies) would be sufficient to universalize primary instruction.[2]

Settling these issues naturally requires knowing which countries are further from universalizing primary instruction, but making the cross-country

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[1]Similar objectives have been agreed upon earlier, see Clemens (2004) for a comprehensive review.

[2]For further contributions to this debate, see Brossard and Gacougnolle (2001), Bruns et al. (2003), Delamonica et al. (2001), Devarajan et al. (2002), Filmer (2001), Binder (2005), and United Nations Educational, Scientific, and Cultural organization (2004).

comparisons required to determine this, is not a simple task. A first section of this paper shows that at least in Latin America and the Caribbean (henceforth, LAC), comparisons that rely on standard aggregate secondary information—the data most often used in the literature—encounter significant obstacles.

To produce alternate comparisons, the paper then calculates some simple indicators of educational access that are comparable in the sense of having been generated using similar information—household survey microdata—from almost every country in the region. Of course, the use of such data is not without its own set of drawbacks, which we discuss in detail.

We use this information to generate four simple and/or generally well-known indicators: (i) age-specific net enrollment ratios, (ii) a measure of the average number of years children spend in school, (iii) a measure of the average number of grades they actually complete, and (iv) the gap between the last two. Because we use micro-data, all these are calculated in an age-specific manner that enables us to make some comparisons that, to our knowledge, have not been feasible before.[3]

We then use these measures to produce several rankings as well as a "bottom line" classification of countries. These seek to capture their performance in two areas: (i) getting children into school on time and keeping them there, and (ii) turning their contact with the educational system into years of schooling.

The results suggest that LAC countries' overall enrollment rates are relatively high, and that therefore children on average spend a substantial number of years in school. There is nevertheless wide variation in how well different systems have done in terms of reducing delayed entry and raising secondary enrollments; and there are also substantial differences in how effectively their educational systems turn children's time in school into actual grades completed.

The multiple rankings we present turn out to be useful because specific countries' performance along these dimensions is not uniform. For instance, the Dominican Republic performs almost as well as the

richest countries when it comes to enrollment, but as badly as the poorest few in terms of turning attendance into years of schooling. Similarly, there are countries, such as Chile, which have been relatively successful at increasing secondary enrollment, and yet are relative under-performers when it comes to reducing delayed entry.

These results are informative regarding the region's progress toward the MDG universal primary education goal. For instance, in concluding that the LAC region is largely "on track" to fulfilling these, many studies assume countries will continue making "linear" progress over time. This might be more realistic in countries in which progress requires raising enrollment rates than in those facing severe repetition problems, which are typically much harder to address. Further, some studies (e.g. Hicks and Wodon, 2002) focus on progress in terms of universalizing enrollment rates rather than primary completion, and our results suggest this is an important distinction.

2. Why use household surveys? Comparability issues

A key task in this paper is to use household survey microdata to generate comparable enrollment and educational attainment information for as many LAC countries as possible. This might seem redundant, to the extent that a large quantity of administrative, aggregate information on such variables is already publicly available.

2.1. Comparability issues

Nonetheless, a first reason to use microdata is that comparisons using aggregate information from secondary sources can be fairly problematic. Table 1 illustrates this using data for the 23 countries covered in this study.[4] Columns 1 and 2 contain the net primary enrollment rates that the World Development Indicators and the Human Development Report (both for 2004), two of the most cited sources of such information, report for this set of countries.[5]

Two examples illustrate the type of difficulties one encounters, and which are crucial particularly if

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[3]An exception is the cross-country survey-based information described in Filmer and Pritchett (1999) and available at www.worldbank.org/research/projects/edattain/edattain.htm. Some comparisons we make are similar to those made by Filmer and Pritchett, but our coverage of LAC countries is more comprehensive.

[4]This sample accounts for the vast majority of LAC countries. It accounts, for instance, for all LAC members of the Inter-American Development Bank except for: Bahamas, Barbados, and Suriname. We return to issues of coverage below.

[5]See World Bank (2004) and United Nations Development Programme (2004).

Table 1
Primary net enrollment rates in selected LAC countries, circa 2000

	Country	Primary net enrollment rate (%)			
		World development indicators (1)	Human development report (2)	This report	
				Ages: 6–13 (3)	Ages: 7–13 (4)
1	Argentina[a]	99.7	108	98.9	99.0
2	Belize	96.2	96	96.9	97.7
3	Bolivia	95.0	94	93.2	95.2
4	Brazil	94.6	97	94.5	96.3
5	Chile	88.8	89	97.5	98.9
6	Colombia	88.5	87	90.8	91.5
7	Costa Rica	92.1	91	94.4	95.1
8	Dominican Republic	92.7	97	96.3	97.1
9	Ecuador	99.5	102	90.9	91.0
10	El Salvador	88.9	89	86.2	88.9
11	Guatemala	84.2	85	N/A	81.3
12	Guyana[a]	98.4	98	96.2	96.5
13	Haiti[a]	N/A	N/A	65.0	69.3
14	Honduras	87.5	87	81.5	85.1
15	Jamaica	95.0	95	99.6	99.5
16	Mexico	99.4	101	95.1	95.3
17	Nicaragua	80.7	82	84.5	87.6
18	Panama	97.8	99	96.8	97.5
19	Paraguay	92.2	92	93.5	94.5
20	Peru	99.9	100	96.4	96.8
21	Trinidad and Tobago[a]	92.6	94	96.2	96.2
22	Uruguay[a]	90.4	90	97.9	98.1
23	Venezuela	88.2	92	95.9	96.3
	Average	93.4	94.0	92.6	93.2
	Std. Dev.	5.4	6.4	7.7	7.0
	Minimum	80.7	82	65.0	69.3
	Maximum	99.9	108	99.6	99.5

Sources: For the World Bank, the figures come from the online version of *World Development Indicators,* for 2004. For the UNDP, the data are as listed in the *Human Development Report*, 2004.
Notes: (1) The figures correspond to those the World Bank lists for 2000, (2) The figures correspond to those the UNDP lists for 2000/2001, (3), (4) We use surveys mainly for the year 2000, see Section 2.2 for a description of the data.
[a]The figures for Argentina, Guyana, Haiti, Trinidad and Tobago, and Uruguay are for urban areas only.

one wishes to generate country rankings, as we do below. First, in the Human Development classification, a few countries have net enrollment ratios above 100 percent (e.g. Argentina and Ecuador with 108 and 102 percent, respectively), something which by definition should not happen.[6]

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[6]The UNDP data come from the *Human Development Report* for 2004, which, as is standard, defines the net enrollment ratio as "the number of students enrolled in a level of education who are of official school age for that level, as a percentage of the population of official school age for that level." This should not produce ratios in excess of 100 percent. Clemens (2004) points out that this problem exists in many data sets used to make international comparisons, and that it is not confined to the LAC region.

Second, there are some results that are surprising to the point of leading one to question the validity of cross-country comparisons using these data. For instance, the Human Development Report lists Chile as having a primary net enrollment rate significantly below that of countries such as Bolivia, Ecuador, and Paraguay. Although the numbers are slightly different, the World Development Report data agree with this ordering. This is surprising given that most researchers would expect Chile's educational outcomes to dominate those of the countries cited along almost all dimensions (for instance, Chile is essentially the first LAC country making a serious push towards universal *secondary* enrollment).

Most likely, such unexpected orderings have their origin in the fact that different countries use different definitions and tools to measure enrollment. Two examples are useful to illustrate this. First, countries' definitions of primary education vary (e.g. grades 1–5 vs. grades 1–8; ages 7–11 vs. ages 6–13). As we show below, this alone can cause otherwise identical performers to be placed rather differently in aggregate comparisons. Adding to the complications this can create, such definitions sometimes change over time even within countries.[7]

Second, enrollment ratios are often measured using different sources of data within each country. For instance, the numerator may come from administrative information, while the denominators may be calculated using population estimates generated from census data.[8] This can easily result in enrollment ratios in excess of 100 percent, even if there is no misreporting. For instance, if children transfer between schools during the academic year, they might be counted twice in administrative data, but only once in the population estimate.[9]

2.2. Household survey data

In order to address such issues, we rely instead on information collected directly from households, namely an extensive set of household surveys assembled by the Inter-American Development Bank (henceforth, IADB).[10] The questions we use

are quite similar across countries, and are roughly variants of the following:

(1) Are you currently enrolled in an educational institution?
(2) What type of studies are you pursuing? (With possible answers including primary schooling, and different types of secondary and post-secondary education).
(3) If you are done with your studies, what type of studies did you last pursue?
(4) Which is the last grade you passed within that type of study?

Such questions enable us to construct enrollment and attainment measures that are age-specific, consistent across countries, and obviously based on a single source of data within each country.

Nonetheless, these data are not without their own disadvantages. First, all results are based on households' *self-declared* reports. One might think that these estimates provide an upper bound on most measures, to the extent, for instance, that households err on the side of declaring their children are in school rather than not. Unfortunately, there is no way to be sure of this, although the average enrollment rates we calculate, for instance, are often lower than those which emerge from official statistics.

In order to maximize the number of countries with chronologically proximate surveys available, we focus the analysis roughly on the year 2000. Table 2 lists the countries considered, along with the year closest to 2000 for which data was available at the IADB. The analysis covers 23 countries with data for 1999, 2000, or 2001.[11] The sample contains information on close to the totality of the LAC population, since the countries excluded are few and have comparatively very small populations.

We note a couple of final drawbacks of these data. For five countries (Argentina, Guyana, Haiti, Trinidad and Tobago, and Uruguay), the surveys are representative of urban areas only, and we have to account for this in the comparisons below. Further, the Venezuelan survey does not identify

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[7]For instance, up to its 1994 educational reform, Bolivia defined primary as the "Ciclo Básico," which spanned grades 1–5 and ages 6–10. After the reform, it understands it as grades 1–8 and ages 6–13. Argentina also made significant reforms in 1994, and to our knowledge these have not been implemented uniformly across the country (given its federalized educational system), introducing further complications.

[8]In many countries, further, administrative data does not classify the age breakdown of children enrolled.

[9]It is particularly easy to observe net enrollment in excess of 100 percent in jurisdictions within countries, again, even in the absence of misreporting. This can happen, for instance, because migration patterns, some of which are seasonal, can cause children to enter administrative and not population counts (and vice versa). See Urquiola (2000) for a discussion and illustrations using Bolivian data.

[10]Specifically, these are part of the *Program for the Improvement of Surveys and the Measurement of Living Conditions* (MECOVI), sponsored by the IADB, the UN Economic Commission for Latin America and the Caribbean, and the World Bank. We did not collect this data, and we therefore rely on the sampling design chosen by different countries' statistical offices. In all calculations below, we use the weights provided within the survey.

[11]As stated, among the IADB members, only Bahamas, Barbados, and Suriname are excluded (we used only surveys available at the IADB—so their absence does not indicate the data might not exist at all). Further, for Trinidad and Tobago, we use a survey from 1992, the only one we could get access to.

Table 2
Countries and household surveys used

	Country	Survey date	Level at which the survey is representative
1	Argentina	Oct-2000	Urban area only
2	Belize	Apr-1999	National
3	Bolivia	Nov–Dec-2000	National
4	Brazil	Sept-1999	National
5	Chile	IV Q-2000	National
6	Colombia	III Q-2000	National
7	Costa Rica	Jul-2000	National
8	Dominican Republic	2000	National
9	Ecuador	Nov-2000	National
10	El Salvador	2000	National
11	Guatemala	Jul–Nov 2000	National
12	Guyana	1999	Urban area only
13	Haiti	2001	Urban area only
14	Honduras	Sept-1999	National
15	Jamaica	2000	National
16	Mexico	2000	National
17	Nicaragua	2001	National
18	Panama	Aug-2000	National
19	Paraguay	Sept-2000 Aug-2001	National
20	Peru	IV Q-2000	National
21	Trinidad and Tobago	May–Jun 1992	Urban area only
22	Uruguay	2000	Urban area only
23	Venezuela	II Q-2000	National

urban areas as a whole, so we assume metropolitan Caracas to be representative of all urban areas in the country.

For a preview of the results these data yield, Table 1 (columns 3 and 4) presents net enrollment rates for the 6–13 and 7–13 age ranges, respectively.[12] The overall averages of these rates are close to those calculated by the World Bank and UNDP, but the two "anomalies" we arbitrarily highlighted above are resolved: (i) there are no net enrollment ratios in excess of 100 percent, and (ii) Chile now has a primary enrollment rate significantly higher than those of Bolivia, Ecuador, and Paraguay.

3. Educational "quantity": basic results on net enrollment

While Table 1 presents results for age ranges, the household survey data yield more detailed age-specific enrollment ratios. For illustration, Fig. 1 graphs these for Chile and Honduras, two fairly extreme cases in the LAC region (the tables necessary to generate such figures for any of the countries we consider are available from the authors). The figures and tables present the national enrollment rates as well as those observed for: males, females, the rural area, and the urban area.

An important note here is that for reasons we will return to below, we only considered individuals enrolled when they were attending grades 1–12. This is only relevant in the upper age ranges (17 and 18) where some high school graduates are enrolled in postsecondary education. Because our focus here is on the "1–12" system, we netted out such individuals.[13]

There are several observations regarding this first set of results:

(1) As is well known, in most LAC countries and for most age ranges, there are few differences between males and females' aggregate enrollment outcomes—so much so that in many cases it is hard to visually tell the three series (male, female, and total) apart. As for Honduras in Fig. 1, when differences emerge, they frequently are in favor of females, although they are often not statistically significant.[14]

(2) In contrast, the differences between the urban and rural areas are more substantial, even in a country like Chile. An important caveat in making comparisons along this dimension is that *we have made no attempt to define the rural area consistently across countries*—we adopt the definition that comes with each survey. Thus, some countries may have a "worse" performance here simply because their urban/rural classification system identifies a more "extreme" population.

(3) A look at the lower age ranges reflects a generally under-appreciated phenomenon: delayed entry

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[12]We include both of these for two reasons. First, countries differ as to the age at which children are officially expected to start school (6 or 7). Second, one of our surveys (Guatemala) starts recording attendance only at age 7, an issue we return to below.

[13]We did this by not counting the attendance of individuals who report they are enrolled in an educational institution, and who also report they have completed 12 years of schooling.

[14]These results are survey-based, they should be viewed as point estimates with associated standard errors.
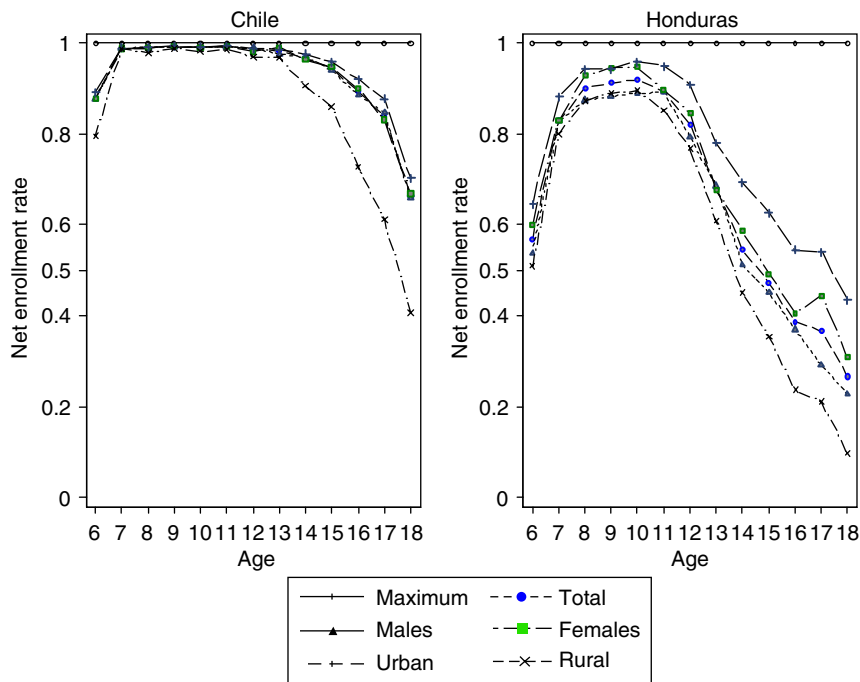
Fig. 1. Age-enrollment profiles for Chile and Honduras.

into primary school. Even in Chile, where primary schooling is close to universal, the net enrollment rate for age 6 is below 90 percent overall, and below 80 percent in rural areas. In Honduras, roughly 40 percent and 20 percent of 6 and 7 year-olds, respectively, do not attend school, with even lower enrollments rates in rural areas. Across all the countries considered, the average net enrollment rates for rural 6 and 7 year-olds are 79 and 89 percent, respectively.

(4) In the 8–13 age range, enrollments are indeed high—in urban areas they exceed 90 percent in all countries but Haiti. Nevertheless, in some countries like Honduras and Guatemala, the national rate never quite approaches 100, leaving open the possibility that a small but non-negligible percentage of children never actually enter school.

(5) As is well known, enrollment rates begin to drop at about 13, 14, or 15 years of age, depending on the country.

(6) Delayed entry and dropping out lead to an "inverted-U" age enrollment profile, which is evident for the rural populations in almost all countries considered. It is also visible even for the aggregate population in Bolivia, Brazil,

Colombia, El Salvador, Guatemala, Haiti, Honduras, and Nicaragua.

(7) This pattern is of particular concern *if* there is reason to believe that children who enter late are also more likely to exit early (something our data cannot reveal). It might be the case, for instance, that boys from low-income households enter late because their parents wish to postpone incurring some direct costs of schooling (e.g. school materials or bus fare). Once they turn 13 or 14 and their opportunity costs climb, their parents might allow them to leave school and start working. In such a scenario, even a system with a relatively high average primary net enrollment rate, like Honduras', will be producing many "graduates" with 5 or fewer years of schooling, *even assuming no repetition*.

(8) Even among countries that do not have particularly high enrollment rates overall, there are some interesting exceptions to the "inverted-U" pattern. Jamaica, for instance, displays the usual drop-out problems in the teenage years, but nevertheless manages to enroll almost every 6 and 7 year old. Guyana, Mexico, and Venezuela also stand out as "good performers" in this regard. It is beyond the scope of this paper to

analyze what policies may be leading to these outcomes (e.g. attendance subsidies in Mexico), but they still highlight a difference across countries that *may* result in educational attainment differences down the line.[15]

In terms of ranking countries, these observations suggest we should consider how thoroughly different educational systems serve three populations: (i) children aged 6–7, those in the range in which delayed entry can be a problem, (ii) ages 8–13, the range in which most children are actually in school in virtually every LAC country, and (iii) ages 14–18, the range generally associated with secondary schooling, in which net enrollment rates fall. The next section provides some rankings based on these criteria.

Before proceeding to those results, it is important to note two characteristics that vary across countries: normative starting ages, and the number of grades in the formal primary and secondary educational system. In most countries in the region, the normative start age is 6 and the whole primary and secondary sequence consists of 12 grades. In a few, however, the start age is 7 (e.g. Guatemala), or the system has only 11 grades (e.g. Colombia). Even among countries with the same normative starting age, the anecdotal evidence suggests there is wide variance in how "seriously" it is enforced.

In the results below, we make no explicit allowance for these differences. If a given country is producing fewer years of schooling at a given age because it explicitly aims to do so (e.g. a country with an official entry age of 7), we simply let the data reflect that and in some sense count it against this country. Nonetheless, one of the final indicators we use to rank countries—a measure of the gap between the average number of years children spend in school and the number of grades they actually complete—does partially adjust for cross-country differences in target attainment.

3.1. Urban enrollment

We begin with a ranking based solely on enrollments in urban areas. This is our benchmark because, as shown in Table 2, five of the 23 countries we consider have surveys representative of only their urban populations. As a first exercise, Table 3 presents rankings according to aggregate

net enrollment ratios as well as according to those observed in each of the three age ranges cited.[16]

Columns 1 and 2 present what we will label Ranking 1, which is based on the entire 6–18 age range. Chile and Argentina place at the top, as one might expect given their per-capita income. Nonetheless, perhaps more surprisingly, countries like the Dominican Republic, Bolivia, and Panama place next, although one must bear in mind that Table 3 covers urban areas only.

El Salvador, Nicaragua, Guyana, Guatemala, Honduras, and Haiti place at the bottom of this sample, as will be the case in many of the comparisons below. Thus, columns 1 and 2 present perhaps the simplest ranking of LAC countries that our data can produce. We also note that this is exactly the ordering that would come out of a "Human Development Index (HDI)"-type calculation based on enrollment, i.e., this is essentially the education part of the ranking that the UNDP would generate if it used our data.[17]

The following columns break down the results into more specific age ranges, and show that Ranking 1 conceals interesting variation. For instance, Chile ranks highest in both the 8–13 and 14–18 age ranges (rankings 3 and 4). The latter is expected given this country's pioneering (in the region) efforts to make secondary schooling universal. In contrast, it ranks much lower, 15th, in the 6–7 age range (Ranking 2). Jamaica illustrates the opposite pattern—it is close to the median in the highest age ranges, but is at the top of Ranking 2 because it manages to get almost all young children into school.

Rankings 1–4 may well reflect policy choices. As already stated, different countries have different normative entry ages (6 or 7), and enforce them to different extents. Further, some countries, like Nicaragua, have enrollment subsidies targeted at children of young ages.[18]

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[16]A final caveat here concerns Guatemala—the one country with a survey that does not collect attendance data for 6-year olds. This is relevant for rankings 1 and 2, which therefore consider this country's performance beginning only at age 7. This does not alter Ranking 1, but it has the effect of moving Guatemala ahead of Honduras and Nicaragua in Ranking 2.

[17]This reflects the fact that the HDI methodology takes any given indicator and then calculates what it labels the Dimension index = $(Actual - Max)/(Max - Min)$, where *Max* and *Min* stand for the maximum and minimum values the indicator can feasibly take, and *Actual* is the country's value. Because the maximum and minimum enrollment rates are 100 and 0, for enrollment this is equal to the enrollment rate.

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[15]We elaborate on the reasons for this ambiguity below.

Table 3
Country rankings by *urban* enrollment rates in specific age ranges

Ranking 1 Ages 6–18		Ranking 2 Ages 6–7		Ranking 3 Ages 8–13		Ranking 4 Ages 14–18	
Country (1)	Rate (2)	Country (3)	Rate (4)	Country (5)	Rate (6)	Country (7)	Rate (8)
Chile	94.3	Jamaica	100.0	Chile	99.0	Chile	88.7
Argentina	93.2	Belize	99.0	Jamaica	99.4	Bolivia	87.0
Dom. Rep.	92.5	Argentina	98.8	Argentina	99.0	Dom. Rep.	84.6
Bolivia	92.0	Uruguay	97.6	Panama	98.5	Argentina	84.0
Panama	92.4	Mexico	97.5	Dom. Rep	98.3	Panama	82.0
Brazil	92.0	Peru	97.3	Belize	98.3	Brazil	79.7
Peru	89.0	Panama	97.2	Paraguay	98.1	Jamaica	78.9
Paraguay	88.6	Venezuela	97.2	Peru	98.1	Paraguay	75.2
Jamaica	88.0	Costa Rica	96.6	Uruguay	97.9	Peru	74.7
Belize	88.0	Trin. & Tob.	96.2	Venezuela	97.6	Ecuador	73.5
Uruguay	87.8	Guyana	95.4	Brazil	97.2	Haiti	72.9
Venezuela	87.8	Dom. Rep.	94.6	Bolivia	97.0	El Salvador	72.8
Costa Rica	86.9	Ecuador	94.4	Costa Rica	96.8	Colombia	72.4
Mexico	86.1	Paraguay	94.0	Guyana	96.5	Venezuela	72.2
Ecuador	85.7	Chile	94.0	Trin. & Tob.	96.2	Uruguay	71.6
Colombia	85.7	Colombia	93.5	Mexico	96.0	Belize	71.3
Trin. & Tob.	84.6	Bolivia	92.1	El Salvador	94.4	Costa Rica	71.2
El Salvador	84.4	Brazil	90.2	Colombia	94.2	Nicaragua	70.2
Nicaragua	82.9	El Salvador	83.5	Nicaragua	93.9	Mexico	69.7
Guyana	80.7	Guatemala[a]	82.7	Ecuador	93.0	Trin. & Tob.	66.1
Guatemala[a]	77.2	Nicaragua	81.5	Honduras	91.4	Guatemala	60.9
Honduras	75.8	Honduras	76.3	Guatemala	90.0	Honduras	56.8
Haiti	68.0	Haiti	42.6	Haiti	72.6	Guyana	55.9

Notes: In making these calculations, we used each country's definitions of urban and rural. In the case of Mexico, we defined as rural those locations with fewer than 15,000 people. For Venezuela, we consider only metropolitan Caracas as urban.

[a]The figures for Guatemala begin only at age 7. Footnote 14 discusses how this affects its relative performance in Rankings 1 and 2, which include age 6.

One possibility this raises is that countries that do manage to enroll children on time may end up with higher average years of schooling. One must be careful about such an inference, however. To see this, suppose households have a target set of skills they want their children to achieve. For instance, assume they want them to learn basic reading and writing skills, but not much beyond that (say because they consider those skills sufficient in the type of labor market they envision for their children). Assume also that this set of skills is mastered upon completion of the 3rd or 4th grade.

If this is the case, then the age at entry might indeed affect the age at which children leave, but perhaps not the years of schooling they eventually complete. In one country, a child might enter at 6 and leave at age 12, after repeating two grades. In another, she might enter at 7 and leave at 13, also after repeating 2 years. In the extreme, in such a scenario, implementing policies to lower the age at entry might have no effect on years of schooling outcomes.[19]

This type of reasoning also suggests that there might be a tradeoff in countries' performance in the three age ranges in Table 3. For a final illustration, consider Bolivia and Uruguay. Bolivia is ranked 17th in the earliest range, 12th in the second, and 2nd in the last. This might reflect children "hanging around" in school trying to achieve skills they have not mastered, either because they entered late or repeated. In contrast, Uruguay does well (4th) in the

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[18]Maluccio and Flores (1994) analyze the impact of such a program in Nicaragua, one of the countries that at least judging by Fig. 1, needs it the most. Brazil and Mexico have similar and much more widely studied programs.

[19]Glewwe and Jacoby (1995) refer to this issue using evidence from Ghana. They further suggest that delayed entry might indeed be optimal if children's readiness for school is cumulative due to nutritional reasons. From this point of view, reducing it might even be counterproductive.

earliest range, but its relative performance goes down thereafter (15th in the final range), which might reflect achievement of a target set of skills or grades at a younger age.

The bottom line is that Table 3 yields interesting comparisons, but these must be made with care and realizing that implicit in many of them is a model of how people decide on the number of years of schooling they desire; i.e., these numbers always reflect the interaction of supply and demand, and hence drawing policy implications from them is complicated.

3.2. National and rural enrollment

Next we present rankings according to enrollment in the same age ranges, but considering countries in their entirety and in their rural areas (again, as defined by each one). As noted, this forces us to drop five countries (Argentina, Guyana, Haiti, Uruguay, and Trinidad and Tobago). Table 4 presents the results for the nationwide samples, and Table 5 those for the rural areas. Because the rankings are very similar to those in Table 3, we simply append an "a" (Table 4) or a "b" (Table 5) to them for purposes of labeling.

Table 4 begins with the nationwide figures. Not surprisingly, the net enrollment rates here are lower than those observed in Table 3, and in general they

also become more variable. In the 14–18 age range in rural areas, only six countries have enrollment rates above 70 percent (as opposed to 18 in the urban sample above). In the 6–7 range, a number of enrollment ratios now fall below 90 percent. Such figures raise the possibility that some of the enrollment shortfalls in rural areas are due to a lack of supply.

In the rural area-based rankings (Table 5), countries with relatively low overall population densities (such as Bolivia and Colombia) generally fare worse, although others, such as Brazil, seem to hold up their previous performance. It is also interesting to note that the countries that do well in the rural sample are not necessarily those that did so in the urban samples. One of the salient and perhaps surprising performers is the Dominican Republic, which does quite well in almost all age ranges and areas.

4. Incorporating educational quality: years in school and years of schooling

This section introduces two additional measures that are informative about the performance of different national educational systems: average years *in school*, and average years *of schooling*.

Table 4
Country rankings by nationwide enrollment rates in specific age ranges

Ranking 1a Ages 6–18		Ranking 2a Ages 6–7		Ranking 3a Ages 8–13		Ranking 4a Ages 14–18	
Country (1)	Rate (2)	Country (3)	Rate (4)	Country (5)	Rate (6)	Country (7)	Rate (8)
Chile	93.1	Jamaica	100.0	Jamaica	99.4	Chile	86.1
Dom. Rep.	91.1	Peru	95.5	Chile	98.9	Dom. Rep.	82.7
Jamaica	89.9	Mexico	95.1	Belize	97.8	Brazil	77.1
Panama	88.1	Panama	94.9	Dom. Rep.	97.8	Bolivia	74.7
Brazil	87.8	Belize	94.4	Panama	97.4	Jamaica	75.6
Bolivia	86.5	Venezuela	94.2	Brazil	96.7	Panama	74.2
Peru	85.8	Costa Rica	93.7	Peru	96.6	Peru	68.8
Venezuela	84.7	Chile	93.3	Venezuela	96.4	Venezuela	66.7
Paraguay	82.3	Dom. Rep.	92.3	Bolivia	95.1	Paraguay	64.4
Mexico	81.5	Ecuador	92.2	Mexico	95.1	Colombia	64.3
Belize	81.4	Paraguay	89.1	Paraguay	95.0	Ecuador	62.0
Colombia	80.6	Colombia	88.7	Costa Rica	94.6	El Salvador	61.3
Costa Rica	80.5	Brazil	87.9	Colombia	91.5	Mexico	59.8
Ecuador	79.8	Bolivia	87.5	Ecuador	90.5	Costa Rica	58.3
El Salvador	76.6	El Salvador	75.7	El Salvador	89.7	Nicaragua	58.1
Nicaragua	74.3	Nicaragua	73.2	Nicaragua	88.2	Belize	56.5
Honduras	65.9	Guatemala	71.3	Honduras	85.4	Guatemala	41.9
Guatemala	64.9	Honduras	69.8	Guatemala	82.9	Honduras	40.8

Table 5
Country rankings by *rural* enrollment rates in specific age ranges

Ranking 1b Ages 6–18		Ranking 2b Ages 6–7		Ranking 3b Ages 8–13		Ranking 4b Ages 14–18	
Country	Rate	Country	Rate	Country	Rate	Country	Rate
Dom. Rep.	88.7	Jamaica	100.0	Jamaica	100.0	Dom. Rep.	79.1
Jamaica	88.2	Venezuela	93.9	Chile	97.8	Chile	70.2
Chile	85.9	Peru	93.6	Belize	97.4	Jamaica	70.0
Venezuela	84.2	Panama	92.5	Dom. Rep.	96.7	Brazil	67.8
Panama	82.4	Mexico	92.2	Venezuela	96.3	Venezuela	66.0
Brazil	82.4	Belize	91.8	Panama	96.2	Panama	61.9
Peru	80.9	Costa Rica	91.4	Brazil	95.0	Peru	59.1
Belize	75.8	Chile	89.1	Peru	94.9	Colombia	52.4
Paraguay	75.3	Ecuador	88.8	Mexico	94.0	Bolivia	52.3
Bolivia	75.1	Dom. Rep.	88.8	Costa Rica	92.9	Paraguay	51.3
Mexico	75.0	Paraguay	83.9	Paraguay	92.3	El Salvador	47.8
Costa Rica	75.0	Colombia	82.5	Bolivia	92.0	Costa Rica	47.1
Colombia	73.5	Bolivia	81.3	Colombia	88.0	Mexico	45.5
Ecuador	69.9	Brazil	80.9	Ecuador	86.8	Belize	43.6
El Salvador	67.9	El Salvador	67.3	El Salvador	84.8	Ecuador	42.1
Nicaragua	63.1	Guatemala	65.6	Nicaragua	81.5	Nicaragua	40.9
Honduras	58.0	Honduras	65.5	Honduras	81.4	Guatemala	30.6
Guatemala	57.7	Nicaragua	63.5	Guatemala	79.0	Honduras	27.0

Note: In making these calculations, we used each country's definitions of urban and rural. In the case of Mexico, we counted as rural locations with fewer than 15,000 people. In the case of Venezuela, we consider only metropolitan Caracas as urban.

4.1. Average years in school

Net enrollment rates display the interaction of demand and supply: the State and the private sector make slots in school available (at given direct and indirect costs), and households decide to use them or not. Thinking of the situation this way suggests another intuitive measure: average years *in school* (not to be confused with average years *of schooling*, to which we turn below), obtained by cumulatively adding age-specific net enrollment rates like those in Table 3.

This summation yields the expected or average number of years that individuals will spend in school by a given age, *given the enrollment patterns currently observed in their country*. In some sense this measure contains no new information relative to that already conveyed by the age-specific net enrollment rates (after all, it is only their cumulative sum). Nonetheless, we introduce it both because it provides a summary of the resources (if only in time) expended by States and households to keep children in school, and because it will provide a useful benchmark against which to compare countries' performance in terms of producing *years of schooling*—i.e., actual grades completed.

To illustrate, columns 2 and 5 in Table 6 present this measure for Chile and Honduras. For age 6, it is simply equal to the net enrollment rate expressed as a proportion (0.88 in Chile, and 0.57 in Honduras). This entry indicates that, *on average*, by the time they are 6 years old, children will have spent 0.88 years in school in Chile, and 0.57 in Honduras. Columns 2 and 5 then cumulate the entries in columns 1 and 4, showing, for instance, that by age 15 Chilean children will have spent an average of 9.7 years in school, while Honduran children will have spent 7.5; by age 18, these figures are 12.1 and 8.6, respectively.

Fig. 2 illustrates why we find this measure useful.[20] For each country, the top segment graphs the maximum feasible attainment (measured in years *of schooling*) that an individual of a given age could have, if she started at age 6 and had a "normal" progression through the educational system. For example, this person could have completed a maximum of 1 year of schooling by age six, 2 by age 7, and so on, up to 12 by age 17.

[20] The precise data behind these figures, and analogous tables for all the countries we consider, are available from the authors upon request.

Table 6
Net enrollment rate, years of school, and years of schooling—Chile and Honduras

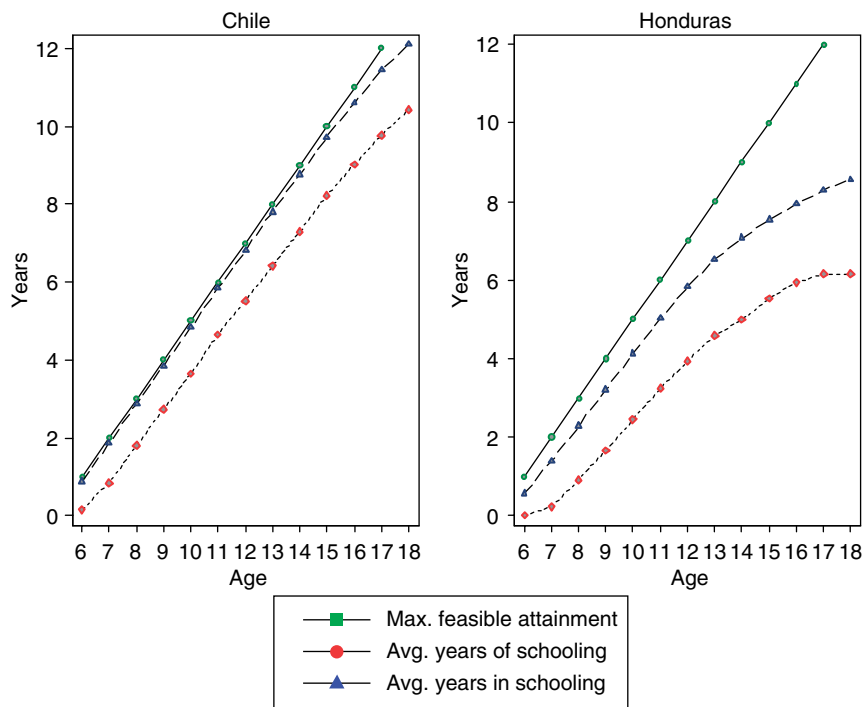| Age	Chile			Honduras		
	Net enrollment rate (1)	Average years in school (2)	Average years of schooling (3)	Net enrollment rate (4)	Average years in school (5)	Average years of schooling (6)
6	87.7	0.88	0.2	56.8	0.57	0.0
7	98.9	1.87	0.8	82.8	1.40	0.2
8	98.9	2.86	1.8	90.1	2.3	0.9
9	99.2	3.85	2.7	91.3	3.2	1.7
10	99.0	4.84	3.7	91.9	4.1	2.4
11	99.2	5.83	4.7	89.3	5.0	3.2
12	98.5	6.81	5.5	82.0	5.8	3.9
13	98.3	7.80	6.4	68.0	6.5	4.6
14	96.6	8.76	7.3	54.7	7.1	5.0
15	94.4	9.71	8.2	47.2	7.5	5.5
16	89.3	10.6	9.0	38.7	7.9	5.9
17	84.0	11.4	9.8	36.6	8.3	6.2
18	66.3	12.1	10.4	26.7	8.6	6.2

Fig. 2. Maximum schooling, average *years in school*, and average *years of schooling* in Chile and Honduras.

The middle line is the average years *in school* measure, drawn from columns 2 and 5 in Table 6. Focusing first on Honduras, note that at age 6, the gap between these two segments is relatively small. A gap is clearly visible, nonetheless, because of the non-trivial delayed entry observed in this country. The two series then run roughly parallel up to about age 10, reflecting the high net enrollment rates in this age range. After that, the two lines diverge markedly, as dropout rates increase.

In the case of Chile, the average years in school segment begins very slightly below the maximum, which reflects the non-zero delayed entry observed even in this country. The gap then essentially does

not grow until about age 14; after that, some divergence is again observed as enrollment rates drop for secondary schooling.

In short, the middle segment captures the *expected* number of years a child in each country will spend in school. It bears repeating that this expectation is taken from a single survey, which imposes several limitations. For example, suppose that Honduras' educational system suddenly improved in terms of the quality of skills it provides in the early grades. One might then reasonably expect that a child who begins school today might eventually display a different trajectory than that experienced by his older siblings. Our calculation, however, is based only on a snapshot of data, and will therefore incorporate the behavior of just such older children.

4.2. Average years of schooling

Finally, columns 3 and 6 in Table 6, as well as the third segment in Fig. 2, present the average years *of schooling* reported by individuals in each of these countries—that is, the grades they claim they have actually passed. An important note is that as explained above, we "truncate" the possible years of schooling at 12 years, so that these results are not comparable with those that emerge from many other studies or the usual aggregate statistics. We do this for two reasons. First, our focus in this paper is on the "1–12" educational system, so we are less interested in schooling people obtain outside of it (e.g. in a university or other post-secondary institution). Second, for schooling levels beyond secondary, it is very difficult to generate comparable years of schooling measures across countries.[21]

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[21]For instance, in different countries the number of years students spend in college or teaching school will be quite different. Further, the coding of questions that apply to these levels tends to be blunter and therefore much harder to make consistent. In many countries, for instance, people in higher education will only respond that they are an "alumno," "egresado," or "titulado" of a given higher educational level. This means that they are either in post-secondary education, have finished all the requirements but some form of thesis, or have finished the degree. Particularly in the first category, assigning a given number of years of schooling is a rough exercise. In fact, it is difficult enough to generate comparable measures even for primary and secondary. First, knowing how to code the responses to the relevant questions requires somewhat detailed knowledge of each country's educational system (we benefited from the help of colleagues at the IADB and World Bank in this regard). Second, even with expert knowledge, complicated issues remain. One important one is that every so often countries alter the

With these caveats, comparing the second and third segments in Fig. 2 gives an indication as to how effectively an educational system turns average years *in school* (contact with the system) into average years *of schooling* (under significant assumptions, skills). Put otherwise, considering the three segments in Fig. 2 provides one answer to the question "why doesn't every 18 year old in Honduras achieve 12 years of schooling?" The figure makes clear that this is due to two distinct problems: the lack of universal attendance (the gap between the first and the second segment), and the failure to turn years in school into years of schooling (the gap between the second and the third), largely but not exclusively due to repetition.

Some further caveats deserve mention. First, the years of schooling series (the lower segment) generally does not begin at one. In other words, even at age 6 the gaps between the second and third segment can be large. Not too much should be made of this because 6-year old children would typically not all have completed 1 year of schooling. This will be particularly the case in countries in which the survey is collected during the school year, since in almost every case we construct the years of schooling measure based on the number of grades people declare they have *completed*.

More important (and a measure we use below) is the growth in the gap between these segments as one moves to the right in these graphs, which reflects the increasing failure of the system to turn years in school into years of schooling. The figure for Chile indicates, for instance, that this gap has grown to about 1 year by the time children reach age 18. In the case of Honduras, the gap at this age exceeds 2 years.

It is tempting to treat this gap as a measure of a system's ineffectiveness, and we do so below. Before presenting results, however, there are a few issues to consider, and they suggest that these two measures (years in school and years of schooling) should be viewed as complementary.

A salient one arises because the measure one might prefer is to some extent a function of whether there are differences in how countries organize their educational system. To see this, consider two

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(*footnote continued*)
organization of their educational systems (the examples of Argentina and Bolivia were cited above). This introduces significant uncertainty as to how both the survey administrators and the respondents interpret the questionnaire.

Table 7
Ranking by average years of schooling accumulated in the formal "1–12" system

Ranking 5 Avg. yrs. *In school* at age 18		Ranking 6 Avg. yrs. *of schooling* at age 18		Ranking 7 Avg. yrs. *of schooling* at age 8		Ranking 8 Avg. yrs. *of schooling* at age 13	
Country (1)	Years (2)	Country (3)	Years (4)	Country (5)	Years (6)	Country (5)	Years (6)
Argentina	12.1	Chile	10.4	Jamaica	2.6	Jamaica	7.2
Chile	12.1	Argentina	9.8	Ecuador	2.5	Argentina	6.5
Dom. Rep.	11.8	Panama	9.5	Belize	2.1	Chile	6.4
Jamaica	11.7	Peru	9.0	Uruguay	2.0	Uruguay	6.3
Panama	11.5	Bolivia	8.9	Venezuela	1.9	Ecuador	6.3
Brazil	11.4	Jamaica	8.8	Dom. Rep.	1.9	Mexico	6.2
Uruguay	11.4	Uruguay	8.7	Mexico	1.8	Venezuela	6.1
Bolivia	11.2	Ecuador	8.7	Chile	1.8	Bolivia	6.0
Peru	11.1	Mexico	8.7	El Salvador	1.8	Panama	6.0
Venezuela	11.0	Venezuela	8.6	Brazil	1.7	Belize	5.6
Trin. & Tob.	11.0	Colombia	8.4	Bolivia	1.7	El Salvador	5.6
Paraguay	10.7	Paraguay	8.4	Argentina	1.7	Peru	5.6
Mexico	10.6	Dom. Rep.	8.3	Panama	1.5	Costa Rica	5.4
Belize	10.6	El Salvador	8.0	Peru	1.5	Colombia	5.3
Guyana	10.5	Costa Rica	7.8	Paraguay	1.5	Dom. Rep.	5.3
Colombia	10.5	Brazil	7.3	Colombia	1.3	Brazil	5.3
Costa Rica	10.5	Belize	6.6	Haiti	1.2	Paraguay	5.0
Ecuador	10.4	Honduras	6.2	Nicaragua	1.2	Honduras	4.6
El Salvador	10.0	Nicaragua	5.9	Costa Rica	1.1	Nicaragua	4.4
Nicaragua	9.7	Haiti	5.9	Honduras	0.9	Guatemala	3.8
Haiti	8.8	Guatemala	5.5	Guatemala	0.7	Haiti	3.4
Honduras	8.6						
Guatemala	8.2						

identical countries, each of which has 30 children and one teacher. Both countries have 2 years to teach their children the same set of skills. Country 1 splits the "curriculum" into 2 years, and all children pass year 1 and successfully complete year 2 as well. Country 2 puts the entire (identical) "curriculum" into first grade. Its children have not mastered it at the end of the 1st year. They all fail but by the end of the second year have mastered the same set of material. The outcomes in terms of skills and cost— one teacher for 2 years—are identical, these countries are simply organizing their systems differently.

Age-specific enrollment rates (or the average years *in school* measure, which essentially summarizes them) would correctly suggest that their outcomes are similar, while the usual average years *of schooling* measure would erroneously suggest one does better than the other. Put otherwise, it is hard to interpret differences in repetition rates across countries unless one has some prior on differences in the structure of their respective school systems.

Thus, under the strong assumption that the body of knowledge children are expected to have at the

end of a given year does not differ too much across countries, the gap between average years in school and average years of schooling might be viewed as an "effectiveness" measure—countries with a small gap would be those that successfully address the problem of excessive repetition, for instance. With these caveats, Table 7 presents rankings according to these two measures.

Ranking 5 orders countries according to the average years *in school* observed at age 18 (we include only a "final" indicator in this case since this measure essentially summarizes the enrollment rates described above). It is clear from this that LAC countries devote substantial resources to education, at least as measured by the time households declare children are in contact with the schooling system— in all but four countries, the average time spent in school exceeds 10 years by age 18.[22]

Rankings 6, 7, and 8 are based on the average years *of schooling* children have accumulated at

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[22]Note that an individual who entered school at age 6 and repeated at least one grade would have spent 13 years in school by the time she is 18, so that 13 rather than 12 is the upper bound on this measure.

three ages: 18, 8, and 13, respectively.[23] We exclude Guyana and Trinidad and Tobago from these rankings, because their questionnaire does not allow one to calculate years of schooling in the detail that is possible for the rest of the sample.

Ranking 6 (columns 3 and 4) refers to age 18. The country with the best performance in this "final" outcome is Chile, which achieved an average of more than 10 years of schooling among 18 years olds in 2000. Argentina and Panama place close behind. There is then a large number of countries (more than half the sample) with between 8 and 9 years of schooling, and a smaller number producing less than 8. The latter group contains some of the usual suspects but also, perhaps more surprisingly, Brazil and Costa Rica. At the extreme, Guatemalan 18-year olds in 2000 had only 5.5 years of schooling on average.

As above, the rankings that result at earlier ages are substantially different. For instance, Chile is much closer to the median in terms of attainment at age 8, partially reflecting its underperformance in the delayed entry-related rankings above. In contrast, Ecuador and Belize start out very strongly, but then factors like repetition or high drop out rates hinder their relative performance.

The fact that the variance in ranking 6 is greater than that in 5 suggests considerable variation on how effective different systems are at turning attendance into years of schooling—countries that do well in rankings 1–5 but not in rankings 6–8 are underperformers in this regard. Brazil and the Dominican Republic are notable examples, albeit in different age ranges.

Because this "failure" is an interesting outcome per se, we present another set of rankings based on the following measure:

Effectiveness gap

= (avg. yrs. in school − avg. yrs. of schooling)

  − (avg. yrs. in school at age 6

  − avg. yrs. of schooling at age 6),

where the last term is meant to capture that a constant difference might exist between these two measures, as mentioned above, perhaps due to the month at which the survey was collected (and how it interacts with the school calendar).[24] Note also that this measure captures a concept similar to the one labeled "internal efficiency" in the educational literature.[25] Finally, note that this measure is also attractive because it at least partially controls for differences in countries' normative starting ages.[26]

Table 8 presents rankings based on the values this measure takes at ages 8, 13, and 18.[27] As expected, the average level of this gap grows with age, although more so in some countries.

Because these rankings take countries' enrollment performances as given, its results are somewhat different from those seen above. For instance, Guatemala and Honduras no longer place at the bottom, but closer to the median of the distribution. In other words, abstracting from their relative poor performance in getting kids in school, these two countries do "OK" in terms of turning attendance into years of schooling. Chile is at the top of the ranking, showing that its first place in "final" outcomes comes not only from high enrollment. In contrast, Brazil, with well-known repetition problems, ranks at the bottom of the table by age 18.

As in all cases above, the results also illustrate that countries' performance is not static along the age range. Colombia is a good example of rapid improvement, i.e., it seems to start with substantial repetition problems, which seem to get mitigated as

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[23]We henceforth stop making the distinction between urban and rural areas despite the fact that the latter are not represented in the surveys of Argentina, Guyana, Haiti, Uruguay, and Trinidad and Tobago. We do so for two reasons. First, we do not have data on years of schooling for Guyana and Trinidad and Tobago anyway. Second, Argentina and Uruguay are the most urban countries our sample (each with an urbanization rate exceeding 90 percent), so that in these two cases the bias is hopefully not large. Finally, as before, the precise data behind these figures, and analogous numbers for all the countries we consider, are available from the authors upon request.

[24]In other words, this is a blunt way to control for the fact that the interaction between factors such as the school calendar, school-starting cutoff months of birth, and the month in which the survey is taken, will introduce constant differences between these two measures across all age ranges.

[25]In general, that concept is measured using a "cohort analysis method," which relies on administrative data that indicates the precise number of students who are promoted, repeat, and drop out of a given educational system (from different cohorts entering the educational system). Naturally, our single cross section of household surveys does not allow us to implement such a measure. We could have also calculated an age-grade distortion indicator, but our measure allows us to abstract from the fact that different countries have different entry ages, as noted below.

[26]For instance, if a country's starting age is 7 rather than the more usual 6, this will be captured in *both* the average years in school and average years of schooling measures, and hence should not affect countries' relative position in terms of the effectiveness gap.

[27]The precise data behind this table, and analogous tables for all the countries we consider, are available from the authors.

Table 8
Ranking by effectiveness gap

Ranking 9 Age 8		Ranking 10 Age 13		Ranking 11 Age 18	
Country (1)	Gap (2)	Country (3)	Gap (4)	Country (5)	Gap (6)
Uruguay	0.2	Argentina	0.5	Chile	0.9
Mexico	0.2	Mexico	0.6	Panama	1.1
El Salvador	0.5	Chile	0.7	Mexico	1.1
Venezuela	0.3	Uruguay	0.7	Colombia	1.3
Chile	0.3	Jamaica	0.9	Peru	1.3
Ecuador	0.3	Panama	0.9	Argentina	1.4
Argentina	0.4	Venezuela	0.9	Paraguay	1.5
Haiti	0.4	El Salvador	1.0	El Salvador	1.7
Guatemala	0.4	Ecuador	1.0	Ecuador	1.7
Belize	0.4	Bolivia	1.1	Guatemala	1.8
Dominican Republic	0.5	Colombia	1.2	Venezuela	1.8
Panama	0.5	Costa Rica	1.3	Costa Rica	1.8
Paraguay	0.5	Peru	1.3	Honduras	1.8
Jamaica	0.5	Honduras	1.4	Bolivia	1.9
Peru	0.6	Guatemala	1.4	Uruguay	1.9
Bolivia	0.6	Paraguay	1.6	Jamaica	3.0
Brazil	0.6	Belize	1.8	Dom. Rep.	3.0
Nicaragua	0.6	Nicaragua	1.8	Haiti	3.1
Colombia	0.6	Brazil	1.9	Nicaragua	3.2
Costa Rica	0.8	Haiti	1.9	Belize	3.7
Honduras	0.8	Dom. Rep.	2.0	Brazil	3.7

children move on in school. Venezuela is an example of the opposite pattern.

5. Summarizing results

From a policy point of view, the results we have presented essentially highlight countries' performance along two dimensions: (i) getting children into school in time and keeping them there, and (ii) turning their contact with the school system into years of schooling. The different rankings we generated show that performance along these dimensions is not uniform—we cited many examples in which a given country's ranking in the same measure varies across age ranges. This implies that readers interested in understanding a specific country's performance will be best served by looking at all these rankings together, and in fact by looking at information which is more detailed and age-specific (as is available from the authors upon request).

Nonetheless, many readers will also be interested in some "bottom line" classification of countries. We attempted to arrive at one by summarizing countries outcomes along the above two dimen-

sions: enrollment and our measure of effectiveness. More specifically, we first created four groups of countries according to their enrollment performance. These are presented in the four rows of Table 9.

As one moves down these rows one finds countries which have generally made less progress in terms of getting children into school. (Within each cell, countries are presented in alphabetical order).

We generated these groups simply by averaging rankings 2, 3, 4, 2b, 3b, and 4b. That is, by taking a simple average of countries' urban and rural enrollment performance in the three age ranges we highlighted: 6–7, 8–13, and 14–18.[28] We then took

[28]This again raises the issue of the countries with urban-only samples: Argentina, Guyana, Haiti, Trinidad and Tobago, and Uruguay. We do not introduce any correction for this (that is, we use only their urban enrollment rates in the calculation) for several reasons. First, Argentina, Guyana and Trinidad and Tobago are excluded from Table 9 anyway because we do not have information on years of schooling and hence effectiveness for them. Based on attendance data only, they would be in the middle groups (2 and 3). Second, Haiti is in the last group by enrollment anyway, and considering its rural area as well would in all likelihood make its performance look even worse, and hence have

Table 9
A "bottom line" ordering of countries by attendance and effectiveness

Enrollment group	Effectiveness group			
	1 (Best)	2	3	4 (Worst)
1 (Best performance)	Argentina Chile Panama Uruguay		Jamaica	Dom. Rep.
2		Bolivia Peru Venezuela	Paraguay	Belize Brazil
3	Mexico[a]	Colombia Ecuador	Costa Rica Paraguay	
4 (Worst performance)	El Salvador	Guatemala	Haiti Honduras	Nicaragua

[a] Regarding Mexico, we note that calculations of years of schooling are difficult past the 9th grade in Mexico are difficult (due to the phrasing of the questions), so this estimate should be based with caution.

this average and used it to separate all cases into four roughly equally sized groups.

The four columns in turn order countries by their relative performance in the effectiveness measure we introduced above—the gap between average years in school and average years of schooling—where those in the left-most column are the best performers. In this case we simply averaged rankings 9, 10, and 11, which capture countries' performance at ages 8, 13, and 18. We then again used the average to divide the countries into four roughly equally sized groups.

The rows indicate that in terms of enrollment the best performers are Argentina, Chile, the Dominican Republic, Jamaica, Panama, and Uruguay. The columns suggest, however, that within this group, Jamaica and particularly the Dominican Republic perform much worse in turning children's contact with the school system into years of schooling.

At the opposite extreme, El Salvador, Guatemala, Haiti, Honduras, and Nicaragua do worst in enrollment. But again there is variance in how they perform in the effectiveness measure: Given the attendance patterns it starts with, El Salvador does as well as Argentina, Chile, Panama, or Uruguay in

this regard. Nicaragua, in contrast, does as poorly as the Dominican Republic.

The countries in the two middle rows are somewhat more similar in that minor changes in the weighting schemes can result in countries crossing from the 2nd to the 3rd group, and vice versa, i.e., the countries in these two rows are not as clearly differentiated—although they are rather more clearly differentiated from the best and worst and best performers (rows 1 and 4).

As far as "effectiveness," Mexico is the best performer in this middle group, and Belize and Brazil are the worst. The last two are probably the clearest examples (along with the Dominican Republic in group 1) of countries that enroll children with substantial success, but whose systems are then very much afflicted by repetition or other problems.

In short, Table 9 provides a summary of countries' performance along the dimensions we have highlighted using comparable household survey data. We experimented with alternate ways of ordering the countries, and as we stated, found that it is possible to get the countries in the middle two rows to move around a bit (e.g. Bolivia and Costa Rica might switch places). Nonetheless, the overall distribution remains similar, and the bottom line is that readers interested in a particular country should focus on the range of boxes close to the one this country occupies—this yields an idea of the type of challenges this country's educational system faces in a comparative perspective.

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(footnote continued)
no effect on this aggregate ranking. Finally, Argentina and Uruguay are the most urban countries in the region, so that excluding their rural populations hopefully does not produce a large bias.
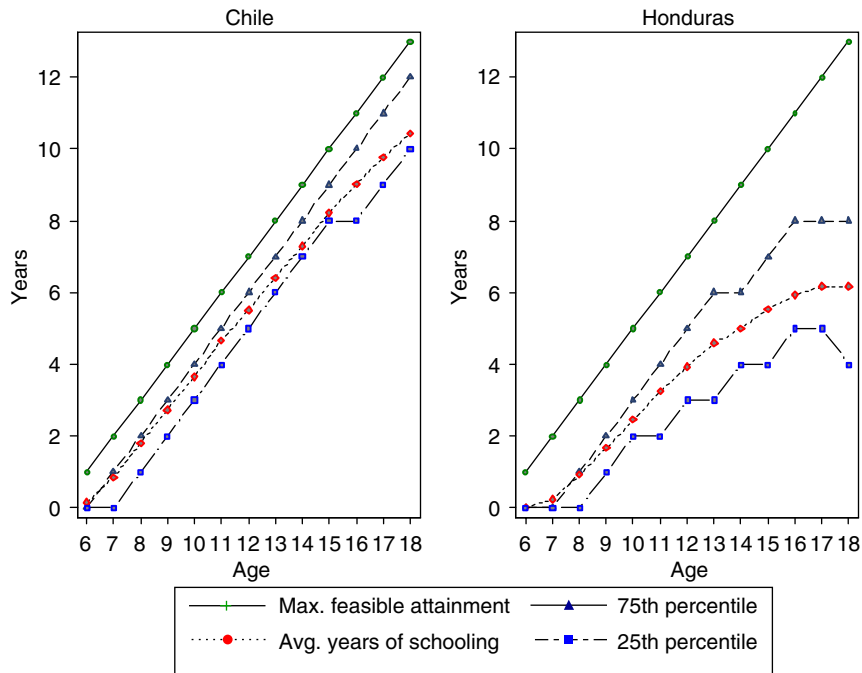
Fig. 3. Maximum schooling, average *years in school*, and average *years of schooling* in Chile and Honduras.

6. Some further results on inequality

A final measure we consider arises because one might like to know how a given attainment level is distributed within a country. To get a sense of this in a simple way, we look at the years of schooling observed at the 25th and 75th percentiles of the years of schooling distribution.[29] For an illustration, Fig. 3 again plots the maximum feasible attainment and the mean years of schooling for Chile and Honduras, but additionally presents the 25th and 75th percentile of the years of schooling distribution.[30]

By this measure inequality increases in both of these countries at very early ages. One can see this

because while the mean and the 75th percentile start increasing immediately with age, the attainment at the 25th percentile is essentially zero until ages 7 and 8 in Chile and Honduras, respectively. The 25th and 75th percentiles then move in lockstep in Chile up to age 15, and up to age 10 in Honduras. In other words, in these age ranges children at these two places of the distribution accumulate years of schooling essentially at the same pace. In Honduras, the two segments then diverge significantly—by age 18, there is a difference of about 4 years of attainment between children at the 25th and 75th percentile of the years of schooling distribution.

Using these measures, Table 10 presents a ranking of countries according to the difference in the years of schooling at the 25th and 75th percentile of the distribution. Rankings 12 and 13 are based on the absolute difference, taken at ages 13 and 18, respectively. As this shows, at age 13, the most equal country by this measure is Belize, with no difference in the attainment of children at the 25th and 75th percentile. At the other extreme is Guatemala, in which the difference even at this relatively young age is already equal to 4 years. This reflects that a non-negligible portion of 13 year olds

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[29]In other words, suppose that a country has 100 fifteen year olds, and that one orders them from the individual with the least years of schooling to the one with the most. These measures would pick up the *number of years* of schooling that the 25th and the 75th individuals have. In a country with no inequality of attainment (say one in which every child enters school at the same age and no one ever repeats), these two would be equal, and the gap between them (which we consider below) would be zero.

[30]The precise data behind this figure, and analogous figures for all the countries we consider, are available from the authors upon request.

Table 10
Rankings based on inter-quartile ranges of years of schooling

Ranking 12 Absolute difference at age 13		Ranking 13 Absolute difference at age 18	
Country (1)	Diff. (2)	Country (3)	Rate (4)
Belize	0	Belize	2
Argentina	1	Chile	
Chile		Jamaica	3
Costa Rica		Peru	
Ecuador		Argentina	4
Jamaica		Bolivia	
Mexico		Costa Rica	
Panama		Dominican Republic	
Uruguay		Costa Rica	
Venezuela		Honduras	
Bolivia	2	Mexico	
Paraguay		Panama	
Peru		Uruguay	
Brazil	3	Colombia	5
Colombia		Paraguay	
Dominican Republic		Venezuela	
El Salvador		Nicaragua	6
Haiti		Haiti	
Honduras		El Salvador	
Nicaragua		Brazil	
Guatemala	4	Guatemala	7

in this country have only one or even 0 years of schooling.

By age 18 (Ranking 13), the best performer is still Belize, joined by Chile in displaying an inter-quartile range of only two. Differences are generally much greater by this point, however, and at the other extreme, Nicaragua, Haiti, Brazil, El Salvador, and Guatemala display a difference of at least 6 years.

We also experimented by normalizing these gaps by countries' mean attainment. There is some movement in the observed rankings, but we omit them because the changes this produces are not substantial. In part, this reflects that countries with small absolute differences also tend to have relatively high attainment.

7. Conclusion

Comparing educational enrollment and attainment across countries in the LAC region is a challenge. At some level, one begins the exercise comparing apples and oranges because data in different countries are collected using different definitions and instruments. Even setting this

problem aside, policy makers sometimes feel that in comparing countries like Chile and Honduras, one is also comparing apples and oranges—i.e., their educational situations may be so different that they should be analyzed separately.

In this paper, we have sought to address the first issue by using household surveys to generate what is hopefully more comparable cross-country information. Specifically, we calculated some simple indicators to produce a number of rankings and a "bottom line" classification that highlight countries' performance in terms of two goals: (i) getting children into school on time and keeping them there, and (ii) turning their contact with the educational system into years of schooling.

The results suggest that in LAC countries, overall enrollment rates are relatively high and that therefore on average children spend a substantial number of years in school. At least by this measure, these societies spend substantial resources on education. There is nevertheless wide variation in how well different systems have done in terms of reducing delayed entry and raising secondary enrollments; and there are also substantial differences in how effectively their educational systems turn children's time in school into actual grades completed.

Further, calculating multiple rankings and classifications turns out to be useful because countries' performance along these dimensions is not uniform. For instance, the Dominican Republic performs almost as well as the richest countries in the region in terms of enrollment, but as badly as the poorest group in terms of "effectiveness" (turning attendance into years of schooling). Similarly, there are countries which have been relatively successful at increasing secondary enrollment, and yet are relative under-performers in terms of reducing delayed entry (e.g., Chile, one of the richest in the region).

Getting back to some of the original motivation, these results also have a bearing in terms of thinking not only about countries' relative positions, but also about their progress towards the MDG enrollment goals. For instance, Glewwe and Zhao (2005) indicate that in concluding that the LAC region is largely "on track" to fulfilling these, cost calculations usually assume countries will continue making "linear" progress over time. This might be significantly more realistic in cases in which progress requires raising enrollment rates than in countries facing severe repetition problems, which are typically much harder to address. The type of analysis

carried out here, therefore, serves to highlight where the more difficult challenges lie.

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