Achieving Universal Education in China

Paul Glewwe, Meng Zhao, and Melissa Binder

2 ●● he A e ic n Ac e A n cience
A igh e e ve

● 2 ●

he vie e e e in hi v e e h e he e ch c n i n e n
nece i h e he ice n e he A e ic n Ac e A n
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A i h cc i n e he A e ic n Ac e e n i i i
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e C hen
Rockefeller and Columbia Universities

vi
Harvard University

in in
American Academy of Arts and Sciences

CHAPTER 1

A ining nive i ch ing , 2 An v i n C i e

PAUL GLEWWE AND MENG ZHAO

ne he ienni eve en e he ni e in i h eve chi c e ee, i ch , hi e ine eve ecen ie h e c c e hec ee ing hi g g e h e e ing ie i ici e h he e in ie ining hi g i c ch n e che hich i h hei c e i e c n ing e ch n hi ing e e che e he e i e evi ence h he e in , e i h e n en in eve ing c n ie ch en en hei chi en he ch c en v i e en ch ice i he e in , e hen he e ing c e i e e he e i ee v n n e i ei n n , h c n e ne in ce en n nen e chi en en hei chi en ch he e e ie he evi ence e hich i ie h e ing c e i e e n gge he e e ch nee e , in e e e i e

n e e e 2 he ni e in e e in , Ci c n ie en e eigh i enni eve en e i ve he i ie in eve ing c n ie , he e 2 he ec n he e eigh g i chieve nive i e c in en ing h eve chi ini he i ch A h gh he e ce ge he n e, inh in he e ge he in en i n in nive i e c in, he e e e nive i e c e i n C e e i n i h ic ch nge c n, ing , C in eve ing c n ie ec n h e ch i i n ne i, enee e i e, en h e, icie eve e i e e h n e he ec n e i n h ve, een , i he ince , n e ge he e h , enn e ice n e he i he ecen e i e e h h ve, een e e n e he ec n e i n e, e ni ici e, i n , he, icie nee e in C Ce he v i i h e e i e e, en n he cc c he i ici ic e, i n

Table 1: Distribution of Developing Countries by Income Level and Region

	Low Income		Middle Income	
Region	**Number of Countries**	**Population (millions)**	**Number of Countries**	**Population (millions)**
Sub-Sahara Africa	39	608	8	50
East Asia and Pacific	9	380	13	1469
South Asia	6	1338	2	19

E

Table 4:

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CU N C S S I UC I N

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Table 5:

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he he h ee egi n e n Cen A i he i e n
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A e ic g e e en ing e en c e ih i i n en in
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ni e he c c e in e een en ing e e e i i n

Teacher Costs and Non-Teacher Costs

he i c i n h h e ine c g ve n en vi ing

An Earlier World Bank Estimate

[illegible]

A UNICEF Estimate

[illegible]

[illegible]

cen n he e e e n g e e i i n hen eve chi ini h i
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en c en in ch he c C ie i i n hich
i ie in ncing g i i n he hi cen i inc e c v
ing in he ne e che hi e n e he ec n inc n
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Some Problems with these Estimates

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g ing ec n ie h ve e e ce e c in g ing
ec n e gene e highe ge hich e n inc e e in e che
ie gn ing g e e e i i n n ee i e c ec e chi en h
e e g e e e i e e in ch ini h i e ch ing hich
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A ing hi n e i ve eve ing c n ie e he i i n ig
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Table 7: Selected Characteristics of the Four Cost Studies

	Devarajan	UNESCO	UNICEF	Bruns
Includes capital costs?	No	Yes	Yes	Yes
Allows for economic growth?	No	No	No	Yes
Include AIDS & orphan cost?	No	No	No	Yes
Adjusts for private schools?	No	No	No	Yes
Accounts for repeaters?	No	No	Yes	Yes
Scenarios to raise school quality?	No	Yes	Yes	Yes
Cost comparison made	Adding new students, relative to current students	Adding new students, relative to current students	Adding new students, relative to current students	Gap in what countries can finance and what is needed
Number of countries included in cost comparison	About 150	151	128	47
Annual cost estimate, billions US$	10–15	9	14–17	0–6

Sources: Authors' summary based on the four studies.

e iv e ch n he he h n e n ve e i e c iv e ch e in nce en iv e g ni i n eg ch ch e n inc e e n e en in iv e ch ec e e he in n ci en n ic ch n h n he g ve n en ge n G c gn e i ve n ev n e inc ing c i c h gh hei e h ing i n c e e c i e he e ici ec gni e hei i i n c e ing he e A he ign e ec n ic g h g e e ei i i n n iv e ch e nic e e e he i ve en he cc n g e e ei i i n n c i c n c e A he i c ec n ic g h n c n chi en h en iv e ch he e h ee ie ive e i e e he nn c chieving C e een i i n n i i n he n nge e i n i ing ec e he e e h h ve e i i ie h n i e ence A h he n n n he c h i c e in e e i e e e n he h c ing i e in hi ec i n h gh n c nvincing

The Most Serious Problem with these Estimates

n n e he e h ee ie n he n e e h c ing h i e i i e g eve h gh ec n ie e ee che e i he n in eve he e i h he en e n e he i e in i e in he in c i n hi e h ic ch nge c n ing C in eve ing c n ie

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n e hi n e ne he c ining C ec e
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en e chi en hich i n i e e e

he ec n cen i h e che e ci e e i ne in hich he
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in 2 n h eh e i nn i e ini e e in
h eh in nici i ie e e cen h eh e e h he
ne e i ch i i hin in e n . e cen e e
h he ne e i ch i i hin in e ch cce i
n e even in c ni ie he e i ch c e i n
e e Acc ing e i nn i e ini e e in he e nici
i ie in he ing ig e e he nici i ie h
e e he c n g ng 2 chi en ge 2 e cen h
e ch e cen he e chi en h e e n
h n ini h i ch en e he in e n hei
chi en h e he h ee in e n e e chi n in e e e
in ch e cen ec n ic e e e cen n chi e
e cen ne 2 e cen ne e

[illegible]

[illegible]

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[illegible]

[illegible]

Assumptions

[illegible]

[illegible]

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e 2 ● n ing h e ch nge ve ie e eve
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e e ic 2 ●●● e cen

An he in h h i n i ic i n c i he
g e e e i i n e ec e hi e e e ine he c n e e
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cen i e cen i hich e e i i n e e e e
c n n 2 ●●● 2 ● n n e icienc i ve en cen i he
ec n cen i e n ch nge c n ie i h e e i i n e e
● e cen n g e c ining e e e i i n ● e cen in 2 ●
c n ie i h e g e e h n ● e cen in 2 ●●●

A hi in c nce n ec n ic g h Ac n i h g
ing ec n i h ve e in e n e ce e c i n
g ing ec n i e in cen h gh he e

$$\text{new} \times clsc_t$$

$clsc_t$ $clsc_t$ $clsc_t$

$$\text{new} \times tchpcls \quad \text{new} \times tchpcls$$

puptchrat

$$\text{new} \times puptchrat_t$$

totpop *prim-age%*

$$primage\% \times totpop_t \times \text{new} \times priv\%$$

inrate

c ×

e *gdp* × *gvrv%gdp* × *edsp%gvrv* × *prsp%edsp*

n he i i n *gvrv%gdp* i e e cen he e % inc e
c n ie e cen % inc e c n ie % h e e c i

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ne ch c e he c gge e h e inc e en g i
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i i n i i n e ec ive

he cen i h eceive he en i nin he n e i
cen i ee e hi c c e he c chieving C 2 ●
hi e i ne i ving ch i enh ncing e icienc n
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e ic e ce inc e e 2 i i n he in ncing g i
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he n e cen i 2 e e ei en h c ni e h
h en he e i e hen e e e ch nge ne en i
c i ici he n cen i i h he e g h
e cen hich e i i ic e eci h n A ic n
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c ec ine ec e e che ie ie g e c i ec ine
igh cen i e ec in he g h e ec
i n e i i ic in ing highe h n e cen g h in
egi n he inc e ein e ce i che inc e e c in e che
ie g in he ei i e e ec n he g cen i e e
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Region	Total Cost (millions US $)	Domestic Resources (millions US $)	Financing Gap (millions US $)
Scenario 7:			

Region	Total Cost (millions US $)	Domestic Resources (millions US $)	Financing Gap (millions US $)

cen i 2 e ine he e i i e che i e e i e
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hi cen i c e ch e h n e ic e ce e ing
in ncing i n ven h n A ic h ch
i i n eve he i ie i e che i e i e high in

CONCLUSION

	Country	UPC Status	Income Level	Most Recent PCR	Most Recent (year)	PCR 2015
7	Korea, Dem. Repub.	no data	low	—	—	—
8	Korea, Republic of	already achieved	middle	96	2000	100
9	Laos	on track to achieve	low	69	2000	100
10	Malaysia	off track	middle	90	1994	85
11	Marshall Islands	no data	middle	—	—	—
12	Mongolia	off track	low	82	1998	—
13	Myanmar	no data	low	—	—	—
14	Papua New Guinea	off track	low	59	1995	83
15	Philippines	on track to achieve	middle	92	1996	100
16	Palau	no data	middle	—	—	—
17	Samoa	already achieved	middle	99	1997	100
18	Solomon Islands	off track	low	66	1994	71
19	Thailand	off track	middle	90	2000	86
20	Tonga	no data	middle	—	—	—
21	Vanuatu	off track	middle	86	1992	52
22	Viet Nam	already achieved	low	101	2001	100
Europe and Central Asia						
1	Albania	off track	middle	89	1995	57
2	Armenia	off track	low	82	1996	—
3	Azerbaijan	already achieved	low	100	1998	100
4	Belarus	off track	middle	93	1996	74
5	Bosnia & Herzegovina	on track to achieve	middle	88	1999	—
6	Bulgaria	on track to achieve	middle	92	1996	98
7	Croatia	already achieved	middle	96	2001	100
8	Czech Republic	already achieved	middle	109	1995	100
9	Estonia	off track	middle	88	1995	55
10	Georgia	off track	low	82	1998	—
11	Hungary	already achieved	middle	102	1995	100
12	Kazakhstan	no data	middle	—	—	—
13	Kyrgyzstan	no data	low	—	—	—
14	Latvia	on track to achieve	middle	86	1996	100
15	Lithuania	already achieved	middle	95	1996	100
16	Moldova	on track to achieve	low	79	1999	100
17	Poland	already achieved	middle	96	1995	100
18	Romania	already achieved	middle	98	1996	100
19	Russia	already achieved	middle	96	2001	100
20	Serbia & Montenegro	already achieved	middle	96	2000	100
21	Slovakia	already achieved	middle	97	1996	100
22	Tajikistan	off track	low	77	1996	—
23	Macedonia	no data	middle	91	1996	100
24	Turkmenistan	no data	low	—	—	—
25	Ukraine	on track to achieve	low	94	2002	—
26	Uzbekistan	no data	low	—	—	—
Latin America and the Caribbean						
1	Antigua & Barbuda	already achieved	middle	98	2000	—
2	Argentina	already achieved	middle	96	2000	100
3	Belize	off track	middle	82	1999	69
4	Bolivia	on track to achieve	middle	72	2000	98
5	Brazil	on track to achieve	middle	72	1999	100
6	Chile	already achieved	middle	99	2000	100
7	Colombia	on track to achieve	middle	85	2000	100
8	Costa Rica	on track to achieve	middle	89	2000	100
9	Cuba	already achieved	middle	—	—	—
10	Dominica	already achieved	middle	103	2000	100
11	Dominican Republic	off track	middle	62	2000	—
12	Ecuador	already achieved	middle	96	1999	100
13	El Salvador	on track to achieve	middle	80	2000	100
14	Grenada	already achieved	middle	106	2001	100

15	Guatemala	off track	middle	52	2000	67
16	Guyana	off track	middle	89	2000	85
17	Haiti	off track	low	40	1997	71
18	Honduras	off track	middle	67	2000	69
19	Jamaica	on track to achieve	middle	94	2000	100
20	Mexico	already achieved	middle	100	2000	100
21	Nicaragua	on track to achieve	low	65	2000	95
22	Panama	on track to achieve	middle	94	2000	100
23	Paraguay	on track to achieve	middle	78	2000	98
24	Peru	already achieved	middle	98	2000	100
25	St. Kitts & Nevis	already achieved	middle	110	2001	100
26	St. Lucia	already achieved	middle	106	2001	100
27	St. Vincent & Grenadines	off track	middle	84	2001	—
28	Suriname	no data	middle	—	—	—
29	Trinidad & Tobago	off track	middle	94	2000	94
30	Uruguay	already achieved	middle	98	2000	100
31	Venezuela	off track	middle	78	1999	55

Middle East & North Africa

1	Algeria	on track to achieve	middle	91	1996	100
2	Bahrain	off track	middle	91	1996	59
3	Djibouti	seriously off track	middle	30	1999	26
4	Egypt	already achieved	middle	99	1996	100

5 Ira4yNdleida2.2831o647(middle)-3643(91)6TJ-24.55q59 -1.25TJ0 -1.25 TD[3)-943(Djibouti)-8950(serio57)inesi5

26 St. Lucia middle 84

16 Guyanaida2.ck middle

28 Suriname no data mi 9(1999)eadCHIE.0545-0.014(Moroc(2026)]TJ(4)

e e n vi C 2 ●● *From Social Assistance to Social evelopment: Targeted Education Subsidies in eveloping Countries* hing n C Cen e
S eve en n n e n i n ic e e ch n i e

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n. 2 ●● *World evelopment Indicators 2002* hing n C he
n.

2 ●● i ing n –e ning c e An c v i n
n. ic c i n in h n . hing n C he
n.

2 ●● en eng hening he n i n c i n n ining in

CHAPTER 2

he C vi ing nive ec n c i n in, eve, ing C n ie

MELISSA BINDER

hi, e, vi e e i e he i i n e, en e h eve, ing c n g ve n en inc in, ing en gh, ce in ec n ch cc e chi en ec n ch ge n e c en e, e i i n e n c c e nn c e e i e , e , i i ni e, n i ni cc ve e h i n n 2 , i i n ve 2 e h i n he e i e e, en i e 2 n 2, i i n e, ec ive n e cen i in hich ch e e ce e, e i i n e A he e c ininc 2 n 22 , i i n, e e cc hen he e i e e e, e n he e, e ience , , e, c ice. c n ie h h ve highe en en h n, e ic e , hei inc e n egi n he e i e e in hi, e n e, e en he c chiev ing nive ec n e c in he n inc e he en c ni e , e e, en e i ie en ing chi en ch n he c n i e he i i n e, en e g ve n en chieving nive , i e e c i n eve he e hi e i e in he e, en e , vi ing he nece ec n ch , ce i n e en i ing, in n e n ing he c nive ec n e c in

— eve e c i n n he c n i, e c n in e, ve i n , e, e e i e i n chi en in eve, ing c n ie , e een he ge 2 n n en ec n ch Acc ing n e, en ive i e e he e chi en i , e e ec n ic , c ive n i h ve e he h c e n highe e i i e h n h e i h e e c i n he e i e evi ence h hei eve e c i n i inhi, i ec n ic g h hen in eve he c n ie in hich he ive 2 n h eve e c i n h ve high c in e e g ne , , ni n e, eing

e n he ec n ic e n ch ing ee ch , , , , evie he h n e i i e ec e c i n ee nn n ch nn 2 ●● 2 nn n ch nn 2 ●● evie hi i e e

hi e vi e ie e he eve ing c n ie n he
2 ●● n i c n ie hich vie
in ig e chi en ge 2 e in he A en i nge he e
c n ie hei n c iic in egi n inc eg A
e h e ie e c n ie n e cen he 2 e
eve ing c n in e e nc eec n ei
e c n ie ● e cen he ge in e e e
ie e in he c c c in he e ining c n ie e cen
he ge inh in e e c c c in n ie
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Table 1: Data Available for Calculating Unit Costs

		Children 12–17 Years of Age in 2000			
		All		Not enrolled	
	Number of Countries	Number in millions	Percent	Number in millions	Percent
Complete data in at least one year between 1998 and 2000	60	405.5	64.5	198.2	60.9
Complete data in different years between 1998 and 2000	9	16.1	2.6	8.9	2.7
Imputed based on partial data	61	187.9	29.9	107.5	33.1
Insufficient data to impute	14	19.0	3.0	est. 10.6	3.3
TOTAL	144	628.5		325.2	

Source: Author's calculations based on World Development Indicators and UNESCO-UIS and Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Populatio Prospects: The 00 Revisio ,* and *World rba i atio Prospects: The 00 Revisio .* Available online: http://esa.un.org/unpp.

Note: Population figures for this age group are provided directly by the UN Population Division (see above). The estimate of those not enrolled was derived as follows. First, I estimated the number of children 12–17 who were enrolled in school by multiplying the total population in this age group by the most recently available net enrollment rate between 1998 and 2000 for the 96 countries reporting this statistic directly. I imputed the net enrollment rate for an additional 35 countries that reported the gross enrollment rate, using the predicted value from a regression of the ratio of the net to gross enrollment rate on per capita income, 12–17 year-old population, spending on secondary schooling as a percent of GDP, and five regional dummy variables. For 13 countries with no enrollment data, I used the average regional enrollment rate. Second, I subtracted the estimated number enrolled from the total 12–17 population.

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Table 2: Summary Statistics by Region, TIMSS Participation, and Income Group

							ALL		TIMSS	
	SSA	SA	EA&P	ME&NA	LA&C	E&CA	Not weighted	Weighted	Not weighted	Weighted
Number of countries										

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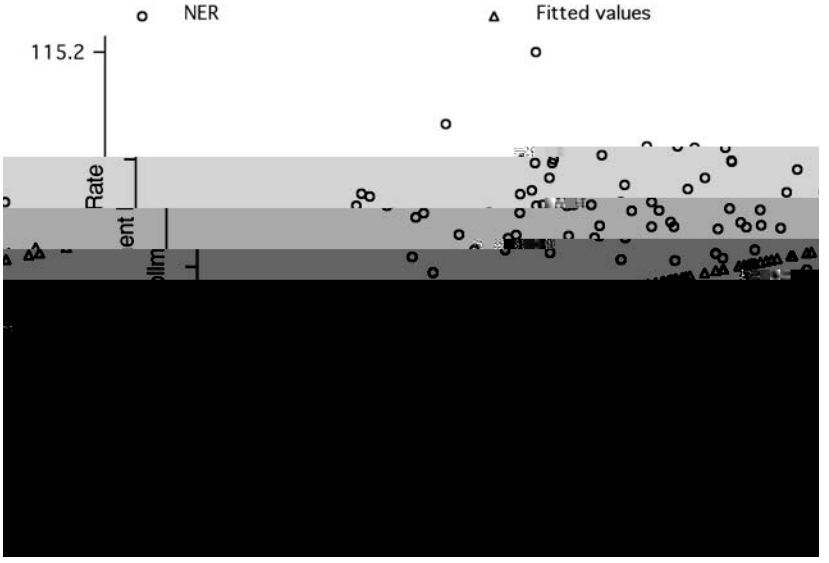
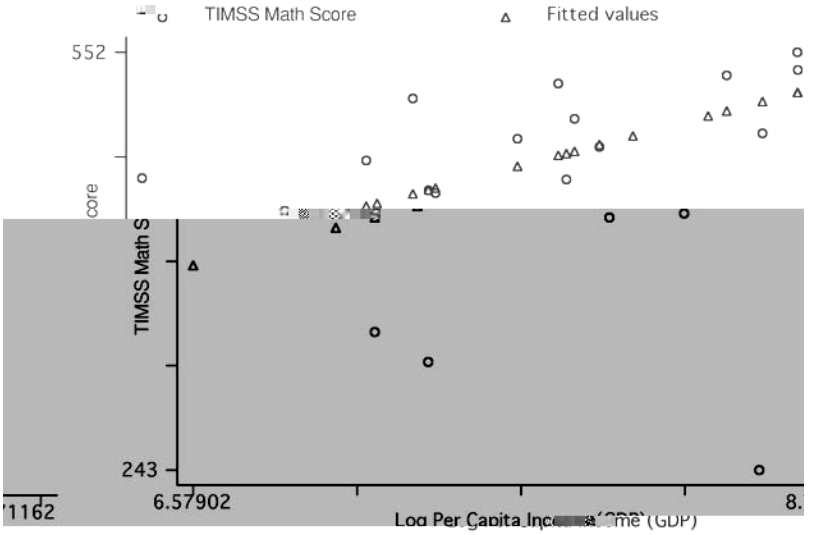
Figure 1: NER, Predicted NER, and Log Per Capita GDP



Source: Author's calculations based on enrollment rates and per capita income reported in the World Development Indicators.

Figure 2: TIMSS Math Score, Predicted Score, and Log Per Capita GDP



Source: Author's calculations based on test scores from the 1999 Trends in International Mathematics and Science Study (TIMSS) and per capita income reported in the World Development Indicators.

Note: Predictions based on a regression model that uses region and income interactions.

Table 4: Education Finance and Service Variables for Countries with Better and Worse than Predicted Net Enrollment Rates Relative to Income and Region, by Income

	Low income			Lower-middle income			Upper-middle income		
	N	Better than predicted	Worse than predicted	N	Better than predicted	Worse than predicted	N	Better than average	Worse than average
GER	38	**48.9**	**29.6**	30	**79.6**	**58.6**	24	**88.0**	**79.0**
NER	38	**42.8**	**24.6**	30	**66.1**	**47.1**	24	**76.2**	**63.5**
Public expenditure on education (% GDP)	32	4.1	3.5	24	4.9	4.0	23	5.2	5.3
Spending on secondary schooling (% of total education spending)	17	**41.8**	**27.9**	19	**31.1**	**48.1**	18	**34.1**	**40.2**
Unit cost in 2002 U.S. dollars	38	$95	$130	29	$364	$378	24	$1102	$1280
Unit cost as % of per capita income	38	**23.4**	**33.6**	29	16.1	23.2	24	19.3	23.5
Transition rate from primary to secondary levels	26	**90.0**	**62.7**	21	87.5	85.4	18	88.1	91.8
Trained teachers	9	68.1	74.5	8	70.7	86.5	0	NA	NA
Pupils per teacher	22	26.4	24.7	22	**20.9**	**17.2**	22	16.3	14.8
Repetition rate	22	**7.1**	**13.9**	21	6.5	6.7	18	5.8	6.8
Per capita GDP	38	$386	$23	92	**$2150**	**$1678**	24	$5730	$5158

Source: WDI and UNESCO-UIS. Unit costs are author's calculations from these sources.

Note: Significant differences in bold font. Significance using one-tailed tests is at the 5 percent level for all variables except spending on secondary schooling as a share of total education spending for low income and upper-middle-income countries, pupils per teacher for lower-middle-income countries, and GER for upper-middle-income countries, which are all significant at the 10 percent level.

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Table 6: Unit Costs (in Constant 2002 U.S. Dollars) under Different Scenarios, by Region and Income Group, per Enrolled Student

	SSA	SA	EA&P	ME&NA	LA&C	E&CA	Total per country	Total per student
Present Unit Costs								
Low Income	$128	$86	$136	$249	$122	$125	$127	$126
Lower-Middle Income	417	82	382	369	325	307	337	244
Upper-Middle Income	820	—	1417	2180	919	1157	1219	884
Country mean	199	85	307	927	544	505	412	—
Mean cost per student	257	117	168	571	577	462	—	296
Best Practice by Income Group								
Low Income	66	66	66	66	66	66	66	66
Lower-Middle Income	290	290	290	290	290	290	290	290
Upper-Middle Income	877	—	877	877	877	877	877	877
Country mean	139	122	203	459	505	398	302	—
Mean cost per student	138	71	247	338	725	329	—	292
Best Practice by Region and Income Group								
Low Income	75	67	23	249	222	93	76	64
Lower-Middle Income	637	82	139	384	312	219	299	221
Upper-Middle Income	785	—	1417	1555	877	902	1014	938
Country mean	171	69	145	741	527	384	336	—
Mean cost per student	231	67	132	492	734	300	—	268

Source: Author's calculations based on data from WDI and UNESCO-UIS.

Note: Best-practice country cost is the median unit cost by income group or region and income group for countries with net enrollment rates higher than predicted by regressions of region and income interactions.

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Table 7: Additional Spending (in Constant 2002 U.S. Dollars) to Achieve Immediate 90 Percent Net Enrollment Rates at the Secondary Level under Alternative Cost and Absorption Assumptions

Present costs			Best practice by income group	Best practice by region and income group
Population to be enrolled (1000s)	Cost per new enrollee	Total cost (millions)		

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Repetition rates unchanged **Repetition 7% or less**

Table 9: Indicators of Median Country Burden and External Aid Requirements for Achieving 90 Percent Net Enrollment Rates, Average Annual Spending over 25 Years (Spending in billions of constant 2002 U.S. dollars)

	Repetition rates unchanged				Repetition rates 7% or less			
	15-year horizon		25-year horizon		15-year horizon		25-year horizon	
	Present costs	Best practice costs	Present costs	Best practice costs	Present costs	Best practice costs	Present costs	Best practice costs
Low Income Countries								
Total present spending=$15.3								
Additional spending needed	$20.3	$8.6	$13.8	$6.1	$16.9	$7.0	$13.2	$5.9
As factor of present spending	3.2	2.0	2.2	1.3	2.5	1.4	2.2	1.2
As share of GDP	2.8	1.2	2.0	0.6	2.1	0.8	1.9	0.6
Foreign aid required after country spends best practice GDP	$16.9	$6.7	$11.1	$4.7	$13.6	$5.1	$10.5	$4.5
Country burden as factor of present spending after foreign aid paid	0.20	0.08	0.19	0.03	0.16	0.06	0.14	0.02
Lower-Middle Income Countries								
Total present spending=$35.9								
Additional spending needed	$10.9	$13.5	$6.5	$9.6	$6.4	$9.3	$5.4	$8.6
As factor of present spending	0.25	0.12	0.11	0.01	0.11	0.06	0.07	0
As share of GDP	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.2
Foreign aid required after country spends best practice GDP	$5.3	$5.8	$3.3	$4.1	$2.9	$3.5	$2.7	$3.5
Country burden as factor of present spending after foreign aid paid	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Upper-Middle Income Countries								
Total present spending=$41.8								
Additional spending needed	$13.4	$12.7	$7.9	$9.3	$6.0	$8.5	$5.7	$7.8
As factor of present spending	0.05	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
As share of GDP	0.07	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Foreign aid required after country spends best practice GDP								

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Table 1: Study Population Countries by Region, Income Classification, and Population 12–17 Years of Age

Table 1: Study Population Countries by Region, Income Classification, and Population 12–17 Years of Age, continued

	Income group	Population 12–17 Years of Age (1000s)
South Asia		
Afghanistan	Low	2,902
Bangladesh	Low	19,019
Bhutan	Low	295
India	Low	127,056
Maldives	Lower-middle	44
Nepal	Low	3,176
Pakistan	Low	19,830
Sri Lanka	Lower-middle	2,134
East Asia & Pacific		
Cambodia	Low	2,196
China	Lower-middle	132,931
Dem. People's Rep. of Korea	Low	2,228
Fiji	Lower-middle	104
Indonesia	Low	26,201
Lao PDR	Low	739
Malaysia	Upper-middle	2,725
Micronesia, Fed. Sts.	Lower-middle	16
Mongolia	Low	367
Myanmar	Low	5,884
Papua New Guinea	Low	700
Philippines	Lower-middle	10,267
Samoa	Lower-middle	25
Solomon Islands	Low	62
Thailand	Lower-middle	6,738
Timor-Leste	Low	130
Tonga	Lower-middle	14
Vanuatu	Lower-middle	29
Viet Nam	Low	10,534
Middle East & North Africa		
Algeria	Lower-middle	4,370
Djibouti	Lower-middle	89
Egypt	Lower-middle	9,630
Iran, Islamic Rep.	Lower-middle	11,046
Iraq	Lower-middle	3,292
Jordan	Lower-middle	690
Lebanon	Upper-middle	427
Libyan Arab Jamahiriya	Upper-middle	804
Malta	Upper-middle	34
Morocco	Lower-middle	3,930
Oman	Upper-middle	333
Palestinian Autonomous Territories	Lower-middle	443
Saudi Arabia	Upper-middle	2,788
Syrian Arab Republic	Lower-middle	2,631
Tunisia	Lower-middle	1,269
Yemen	Low	2,697

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Table 2: Study Population Countries included in TIMSS

	Income group	Region
Bulgaria	Lower-middle	E&CA
Czech Republic	Upper-middle	E&CA
Hungary	Upper-middle	E&CA
Indonesia	Low	EA&P
Iran, Islamic Rep.	Lower-middle	ME&NA
Jordan	Lower-middle	ME&NA
Latvia	Upper-middle	E&CA
Lithuania	Upper-middle	E&CA
Malaysia	Upper-middle	EA&P
Morocco	Lower-middle	ME&NA
Philippines	Lower-middle	EA&P
Republic of Moldova	Low	E&CA
Romania	Lower-middle	E&CA
Russian Federation	Lower-middle	E&CA
Slovak Republic	Upper-middle	E&CA
South Africa	Lower-middle	SSA
Thailand	Lower-middle	EA&P
Former Yugoslav Rep. of Macedonia	Lower-middle	E&CA
Tunisia	Lower-middle	ME&NA
Turkey	Lower-middle	E&CA

Source: 1999 TIMSS and World Bank 2003 list of developing countries.

Table 3: Best Practice Countries by Performance Criteria

	Net Enrollment Rate		TIMSS
	High relative to income	High relative to income & region	High relative to income[1]
Sub-Saharan Africa			
Botswana	X	X	
Eritrea		X	
Gambia		X	
Ghana		X	
Liberia		X	
Malawi		X	
Mauritius	X	X	
Namibia		X	
Sierra Leone		X	
South Africa		X	0
Swaziland		X	
Zimbabwe		X	
South Asia			
None			
East Asia & Pacific			
Indonesia			X
Malaysia	X	X	0
Mongolia	X	X	
Philippines	X	X	0
Samoa	X	X	
Tonga	X	X	
Viet Nam	X	X	
Middle East & North Africa			
Algeria	X	X	
Egypt	X	X	

Table 3: Best Practice Countries by Performance Criteria, continued

	Net Enrollment Rate		TIMSS
	High relative to income	High relative to income & region	High relative to income[1]
Chile	X	X	
Colombia		X	
Jamaica	X	X	
Nicaragua		X	
Panama	X	X	
Peru	X	X	
St. Lucia	X	X	
Trinidad and Tobago	X	X	
Uruguay	X		
Europe & Central Asia			
Albania	X		
Armenia	X		
Azerbaijan	X	X	
Belarus	X		

Table 4: Derivation of Spending Calculations

Unit Costs
1. Total Education Expenditure = [Share of GDP in Education Spending (current and capital)] X [2000 Country

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Con . / . o

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, i ec e , e C hen , c, e e e n C , i nive i ie n , vi , v nive i he Ac e , ec n nive ic n ec n c in , A i , n ing e ie i i ci in ie he i n e e n n c n e ence , vi ing n e c in high i chi en in he , ing g , e inve ig ing n e , ic inc ing , ic c n ne c in e , n in hi e c in eve , en c n e ence ining nive e c in e n e c in e , n i n g n e en nive e c in , iic n , ce e c in e c nive e c in n he h n e c in he A , ec i , , e , g n he i i n e n in hn ee he en i n i n , c, e n n n n n n n he A e ic n Ac e A n cience

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