

South Africa's education funding-outcomes paradox: a partial explanation

Seán M. Muller

University of Cape Town

September 26, 2013



Is South African education spending 'high'?

International comparison of resources devoted to education

Decomposing international differences

Conclusion

References

A question to which we know the answer?



A question to which we know the answer?

- Why is South African education in such a mess? Are resources a key contributory factor?



A question to which we know the answer?

- Why is South African education in such a mess? Are resources a key contributory factor?
 - The current consensus (Sayed and Motala (2012), Taylor et al. (2008), van der Berg (2007) and Jansen and Taylor (2003)) is that South Africa spends a relatively large amount on education relative to other countries, therefore resources cannot be the problem in SA



A question to which we know the answer?

- Why is South African education in such a mess? Are resources a key contributory factor?
 - The current consensus (Sayed and Motala (2012), Taylor et al. (2008), van der Berg (2007) and Jansen and Taylor (2003)) is that South Africa spends a relatively large amount on education relative to other countries, therefore resources cannot be the problem in SA
- Buttressing the conventional wisdom:
 - Some notable contributions to economics of education literature argue that relevance of resources is overstated [cf Hanushek]
 - There is ample evidence of efficiency, quality and accountability problems [cf van der Berg plenary]



A question to which we know the answer?

- Why is South African education in such a mess? Are resources a key contributory factor?
 - The current consensus (Sayed and Motala (2012), Taylor et al. (2008), van der Berg (2007) and Jansen and Taylor (2003)) is that South Africa spends a relatively large amount on education relative to other countries, therefore resources cannot be the problem in SA
- Buttressing the conventional wisdom:
 - Some notable contributions to economics of education literature argue that relevance of resources is overstated [cf Hanushek]
 - There is ample evidence of efficiency, quality and accountability problems [cf van der Berg plenary]
- But is the conventional wisdom correct? I suggest an answer in three tables and two decompositions...



Is South African education spending 'high'?

International comparison of resources devoted to education

Decomposing international differences

Conclusion

References

An alternative approach and decomposition # 1



An alternative approach and decomposition # 1

- We consider alternative variable from World Bank database: 'education spending per pupil relative to GDP per capita'
 - OECD (2013) also do this, but we go quite a lot further



An alternative approach and decomposition # 1

- We consider alternative variable from World Bank database: 'education spending per pupil relative to GDP per capita'
 - OECD (2013) also do this, but we go quite a lot further
- Denote this variable as Z , the variable capturing education spending (E) relative to GDP (W) as X and the variable representing the proportion of government spending (G) devoted to education as Y . The total population is N and the number of learners is N_L . Then:



An alternative approach and decomposition # 1

- We consider alternative variable from World Bank database: 'education spending per pupil relative to GDP per capita'
 - OECD (2013) also do this, but we go quite a lot further
- Denote this variable as Z , the variable capturing education spending (E) relative to GDP (W) as X and the variable representing the proportion of government spending (G) devoted to education as Y . The total population is N and the number of learners is N_L . Then:

$$\begin{aligned}
 Z &= \frac{E}{N_L} / \frac{W}{N} \\
 &= \frac{E}{W} \times \frac{N}{N_L} \\
 &= X \times \frac{N}{N_L}
 \end{aligned}$$

(1)



Table 1: International comparison of resources devoted to education

Country	Educ spending/total govt		Educ spending/GDP		Spending per pupil/ GDP per capita	
	Percent	Rank	Percent	Rank	Primary rank	Secondary rank
Finland	12.60	114	6.20	31	50	21
Ghana	24.40	5	5.53	43	86	25
Kenya	22.35	17	6.58	23	21	69
Korea	15.27	78	4.23	94	52	56
LAC	15.13	.	4.20	.	.	.
OECD	11.99	.	5.34	.	.	.
South Africa	18.06	44/168	5.28	61/177	81/158	84/155

Notes: Author's calculations based on World Bank education statistics database. To create a large comparison group despite missing data the median value of the relevant variables was taken for each country from all data available over the period 2000-2011. This yields 155 countries for the secondary ranking and 158 for the primary ranking.

Decomposition # 2



Decomposition # 2

- Decompose differences in countries' per-pupil per-capita measure into 3 components: government spending on education, government as percent of GDP and pupil population as percent of total population

$$\begin{aligned} X &= Y \times \frac{G}{W} \\ \Rightarrow Z &= Y \times \frac{G}{W} \times \frac{N}{N_L} \end{aligned} \quad (2)$$



Decomposition # 2

- Decompose differences in countries' per-pupil per-capita measure into 3 components: government spending on education, government as percent of GDP and pupil population as percent of total population

$$\begin{aligned}
 X &= Y \times \frac{G}{W} \\
 \Rightarrow Z &= Y \times \frac{G}{W} \times \frac{N}{N_L}
 \end{aligned} \tag{2}$$

- For two countries A and B we can write the ratio of the education spending per pupil relative to GDP per capita as:

$$Z_a/Z_b = \left(\frac{E_a}{G_a} / \frac{E_b}{G_b} \right) \times \left(\frac{G_a}{W_a} / \frac{G_b}{W_b} \right) \times \left(\frac{N_a}{N_{ap}} / \frac{N_b}{N_{bp}} \right)$$



Table 2: Decomposing South Africa's ranking differences (2009)

PRIMARY

Country	Per pupil/ GDP per capita		Primary educ/ total govt		Govt/GDP		Total popn/ primary popn	
Argentina	1.11	[8]	0.59	[6]	1.33	[9]	1.42	[10]
Botswana	0.55	[14]	0.39	[11]	1.48	[6]	0.94	[14]
Chile	1.06	[9]	0.88	[4]	0.76	[12]	1.58	[8]
Cuba	2.84	[1]	0.65	[5]	2.30	[1]	1.90	[7]
Germany	1.17	[7]	0.21	[14]	1.48	[7]	3.76	[1]
Finland	1.34	[5]	0.37	[12]	1.72	[3]	2.14	[5]
France	1.21	[6]	0.28	[13]	1.74	[2]	2.45	[2]
United Kingdom	1.60	[4]	0.49	[8]	1.53	[5]	2.11	[6]
Ghana	0.75	[11]	1.13	[1]	0.68	[13]	0.98	[13]
Mauritius	0.59	[13]	0.46	[10]	0.84	[11]	1.52	[9]
Peru	0.60	[12]	1.07	[2]	0.48	[14]	1.17	[11]
Poland	1.73	[3]	0.55	[7]	1.36	[8]	2.30	[4]
Sweden	1.86	[2]	0.48	[9]	1.68	[4]	2.30	[3]
South Africa	1.00	[10]	1.00	[3]	1.00	[10]	1.00	[12]



Table 2: Decomposing South Africa's ranking differences (2009)

SECONDARY								
Country	Per pupil/ GDP per capita		Secondary educ/ total govt		Govt/GDP		Total popn/ secondary popn	
Argentina	1.53	[7]	1.17	[4]	1.33	[9]	0.99	[11]
Botswana	1.56	[6]	1.15	[5]	1.48	[6]	0.91	[12]
Chile	0.93	[12]	1.24	[3]	0.76	[12]	0.99	[10]
Cuba	2.86	[1]	1.01	[7]	2.3	[1]	1.23	[5]
Germany	1.39	[9]	0.86	[12]	1.48	[7]	1.1	[7]
Finland	2.03	[2]	0.87	[11]	1.72	[3]	1.36	[1]
France	1.66	[5]	0.76	[14]	1.74	[2]	1.26	[3]
United Kingdom	1.76	[4]	0.98	[9]	1.53	[5]	1.17	[6]
Ghana	1.48	[8]	2.82	[1]	0.68	[13]	0.78	[14]
Mauritius	0.81	[13]	1.13	[6]	0.84	[11]	0.86	[13]
Peru	0.61	[14]	1.27	[2]	0.48	[14]	1	[8]
Poland	1.37	[10]	0.79	[13]	1.36	[8]	1.27	[2]
Sweden	1.86	[3]	0.88	[10]	1.68	[4]	1.26	[4]
South Africa	1	[11]	1	[8]	1	[10]	1	[9]



Is South African education spending 'high'?

International comparison of resources devoted to education

Decomposing international differences

Conclusion

References

Real educational expenditure



Real educational expenditure

- How much should we make of relative rankings based on these ratios anyway...?



Real educational expenditure

- How much should we make of relative rankings based on these ratios anyway...?
- Why not look at relative 'real' educational expenditure?



Real educational expenditure

- How much should we make of relative rankings based on these ratios anyway...?
- Why not look at relative 'real' educational expenditure?
- We look at: nominal and real (PPP adjusted). But how useful is the generic PPP adjustment anyway? So adopt a crude, but arguably improved, third measure: weighted index based on teacher cost and PPP.



Table 3: Reconsidering 'real' educational expenditure

PRIMARY

Country	Nominal spending per pupil		PPP adjusted		Weighted PPP-salary adjusted	
Argentina	105 574	[26]	159 993	[29]	544 376	[16]
Chile	95 445	[28]	169 342	[27]	313 714	[43]
Finland	664 499	[9]	547 161	[13]	662 062	[15]
France	660 137	[10]	572 196	[10]	679 024	[14]
United Kingdom	721 981	[7]	623 679	[8]	733 002	[10]
Ghana	11 905	[55]	17 311	[58]	216 482	[56]
Peru	26 187	[48]	55 605	[48]	401 467	[32]
Sweden	964 225	[2]	772 946	[4]	1 012 934	[3]
South Africa	74 857	[33]	127 472	[32]	267 570	[48]

Notes: 1. Figures show educational expenditure per pupil calculated as: share of the relevant level of education x share of education in government spending x government expenditure in current dollars.

2. The numbers in brackets are the ranking of the country in that row for the column variable; there are 69 countries with data on all primary school variables and 61 with data at the secondary level, so the full set of rankings range from 1 (the 'best') to 69 or 61 (the 'worst') respectively.



Table 3: Reconsidering 'real' educational expenditure

SECONDARY

Country	Nominal spending per pupil		PPP adjusted		Weighted PPP-salary adjusted	
Argentina	115 442	[25]	160 959	[28]	561 041	[27]
Chile	92 104	[29]	156 637	[30]	336 504	[43]
Finland	1 325 176	[2]	1 092 366	[4]	1 397 930	[4]
France	1 073 103	[5]	944 352	[6]	1 150 957	[6]
United Kingdom	1 026 213	[6]	888 286	[8]	948 560	[15]
Ghana	13 925	[48]	20 418	[51]	242 137	[47]
Peru	27 940	[44]	59 328	[43]	481 957	[32]
Sweden	1 303 355	[4]	1 094 927	[3]	1 404 128	[3]
South Africa	83 400	[31]	139 139	[33]	282 604	[46]

Notes: 1. Figures show educational expenditure per pupil calculated as: share of the relevant level of education x share of education in government spending x government expenditure in current dollars.

2. The numbers in brackets are the ranking of the country in that row for the column variable; there are 69 countries with data on all primary school variables and 61 with data at the secondary level, so the full set of rankings range from 1 (the 'best') to 69 or 61 (the 'worst') respectively.



Conclusions?



Conclusions?

- Cross-country comparisons that account for demographic differences do not support the conclusion that South Africa has high public education expenditure



Conclusions?

- Cross-country comparisons that account for demographic differences do not support the conclusion that South Africa has high public education expenditure
- Comparisons using a more subtle measure of real expenditure have similarly sobering effects on SA's international ranking



Conclusions?

- Cross-country comparisons that account for demographic differences do not support the conclusion that South Africa has high public education expenditure
- Comparisons using a more subtle measure of real expenditure have similarly sobering effects on SA's international ranking
- Given this, the hypothesis that poor educational outcomes may be due to resource shortages - including through effects on quality and effort - ought to be reconsidered
 - In Fiske and Ladd (2004)'s framework: we need to look at 'resource adequacy'
 - Remainder of paper looks at one small aspect of this: teacher resource adequacy (class size, salaries & quality, contact time)



Bibliography

- Fiske, E. and H. Ladd (2004). *Elusive Equity: Educational Reform in Post-apartheid South Africa*.
- Jansen, J. and N. Taylor (2003). Educational change in South Africa 1994-2003: Case studies in large-scale education reform. *World Bank Country Studies: Education Reform and Management Publication Series II(1)*.
- OECD (2013, March). *OECD economic surveys: South Africa 2013*. http://dx.doi.org/10.1787/eco_surveys-zaf-2013-en.
- Sayed and Motala (2012). Equity and 'no fee' schools in South Africa: Challenges and prospects. *Social Policy and Administration* 46(6), 672-687.
- Taylor, N., B. Fleisch, and J. Shindler (2008, February). *Changes in Education Since 1994*. Report for Presidency's 15-year review.
- van der Berg, S. (2007). Apartheid's enduring legacy: Inequalities in education. *Journal of African Economies* 16(5), 849-880.
- World Bank (2012). *Education Statistics Database*. Available at 

