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Weighing up the balance

ONE of the universal findings of educational research has been that children from higher socio-economic backgrounds tend to do better on tests of educational achievement than children from poorer backgrounds – mainly because children from wealthier homes have greater access to a range of human and material resources that encourage, facilitate, and reward school learning.

However, when discussing the performance of whole school systems, there has often been a tendency to ignore this research finding and focus instead on what are widely described as 'league tables' – in which countries are ranked according to the average achievement scores of their pupils. Comparative judgments about the performance of school systems based on this **traditional view** are sometimes misleading (because differences observed in average pupil achievement among school systems may be influenced by differences in pupil socio-economic intakes), and always quite narrow (because such judgments bypass important issues related to equity).

Research conducted by the 14 countries of the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) has moved away from the use of simplistic league tables towards a broader **alternative view** of school system performance. The SACMEQ researchers expressed this alternative view as an operational definition of high performance that included three benchmarks:

"High performance school systems should demonstrate:

➤ **high quality** – illustrated by high values on an indicator of expected average pupil reading achievement in a situation where the socio-economic backgrounds of pupil

intakes are equal to the average across all school systems; **and**

➤ **high social equity** – illustrated by low values on an indicator of the impact of pupil socio-economic background on reading achievement; **and**

➤ **high distributional equity** – illustrated by low values on an indicator of the spread in pupil reading achievement."

### Constructing socio-economic gradient lines

The SACMEQ researchers commenced their comparative analysis of the traditional and alternative performance of SACMEQ school systems by constructing socio-economic gradient lines that summarized the regression relationships between pupil reading achievement and pupil socio-economic background. They noted that there were negligible differences between lines generated by ordinary least squares (OLS) and hierarchical linear modelling (HLM) procedures.

Pupil reading achievement was measured by a test given to Grade 6 pupils based on a cross-national analysis of SACMEQ school system curricula. The test scores were transformed to a SACMEQ mean of 500 and a standard deviation of 100. Pupil socio-economic background was measured by an index that combined information on the education of pupils' parents and the characteristics of pupils' homes (including house construction, home lighting, and possessions). The index scores were transformed to a SACMEQ mean of zero and a standard deviation of 100.

The socio-economic gradient lines for all SACMEQ school systems have been described in the *Table*. They have also been illustrated in the *Figure* for three school systems: Seychelles, Tanzania, and

Mauritius. The results showed that the socio-economic gradient lines varied across school systems in terms of height, slope, and length.

➤ **Line height**: The heights of the socio-economic gradient lines represented 'adjusted' measures of the quality of education. These values estimated the expected average pupil reading achievement when all school systems had pupil socio-economic intakes that were equal to the SACMEQ average. The average line height for all SACMEQ school systems was 492 points, and the school system line heights ranged from a low of 435 points for Mauritius to a high of 571 points for Tanzania.

The **line heights** (illustrated in the *Figure* by the **heights of the line intercepts** with the vertical axis) provided a 'fairer' and more meaningful alternative approach to **comparing the contributions of school systems** to the quality of educational outputs – because these figures had a built-in adjustment for different pupil socio-economic intakes. In contrast, the traditional approach of using **average pupil reading achievement** (illustrated in the *Figure* by the **heights of the line centres** above the horizontal axis) was more closely oriented towards **comparing the combined contributions of school systems and pupil socio-economic intakes**.

The results for Seychelles and Tanzania provided an interesting contrast. Under a traditional view of school system performance, Seychelles was the best school system with an average pupil reading achievement of 582 points, and Tanzania was fourth best with an average of 546 points. However, everything looked different from an alternative point of view because, under the assumption of

equivalent pupil socio-economic intakes, Tanzania had the highest expected average pupil reading achievement of 571 points, and Seychelles had the sixth highest expected average pupil reading achievement of 509 points.

► **Line slope:** The slopes of the socio-economic gradient lines represented the degree of social equity in pupil reading achievement. These values quantified the impact of a one standard deviation unit change in pupil socio-economic background on pupil reading achievement. The average line slope for all SACMEQ school systems was 41, and the school system line slopes ranged from 16 for Mozambique to 89 for Mauritius.

Smaller line slopes implied greater social equity. Steeper line slopes suggested major differences in average pupil reading achievement across different socio-economic groups – with the potential danger that pupils from poorer backgrounds might be left far behind pupils from wealthier backgrounds.

Lower levels of social equity occurred for Seychelles, Mauritius, and South Africa where the line slopes were 58, 89 and 70 respectively. Higher levels of social equity occurred for Mozambique, Lesotho and Malawi, where the line slopes were around 16 to 17.

► **Line length:** The lengths of the socio-economic gradient lines represented the degree of distributional equity in pupil reading achievement. These values were

scaled to be equal to the variance (divided by 100) of the pupil reading scores. The average line length for all SACMEQ school systems was 80, and the school system line lengths ranged from 25 in Malawi to 155 in Seychelles.

Shorter line lengths implied greater distributional equity. Greater line lengths suggested major differences between the reading achievements of the most and least able pupils – with the potential danger that some pupils might succeed while many other pupils were left far behind.

Lower levels of distributional equity occurred for Seychelles, Mauritius, and South Africa – where the variances in pupil reading scores were almost twice the SACMEQ average of 80. Higher levels of distributional equity occurred for Mozambique, Lesotho and Malawi where the variances were 42, 34 and 25, respectively.

### Judging the performance of school systems

The SACMEQ school systems were ranked in the *Table* according to the **traditional view**. Seychelles was top of the list with an average pupil reading achievement of 582 points; Mozambique and South Africa were in the middle with 517 and 492 points, respectively; and Malawi was at the bottom of the list with 429 points.

The performance of the SACMEQ school systems under the **alternative view** was examined by combining SACMEQ's

operational definition of school system performance with the research results presented above. This resulted in a high performance school system being defined as one that satisfied **all three** of the following benchmarks: *High quality* – with line heights greater than the SACMEQ average of 492; *High social equity* – with line slopes less than the SACMEQ average of 41; and *High distributional equity* – with line lengths less than the SACMEQ average of 80. The figures in bold in the final three columns of the *Table* designated benchmarks that were satisfied by school systems.

Only three SACMEQ school systems satisfied all three of the alternative view benchmarks for high performance: Swaziland, Botswana, and Mozambique. From a traditional view of performance these school systems had only been rated from fifth to seventh.

The four best school systems from a traditional view of performance were those at the top of the *Table* with the highest average pupil reading achievement: Seychelles, Kenya, Tanzania, and Mauritius. However, **none** of these school systems satisfied all three of the high performance benchmarks under the alternative view: Kenya did not meet the social equity benchmark; Seychelles and Tanzania did not meet the social and distributional equity benchmarks; and Mauritius did not meet any of the benchmarks.

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Table: Traditional and alternative views of performance

| School system | 'Traditional' view          |                        | 'Alternative' view          |                                      |
|---------------|-----------------------------|------------------------|-----------------------------|--------------------------------------|
|               | Average pupil reading score | Quality<br>Line height | Social equity<br>Line slope | Distributional equity<br>Line length |
| Seychelles    | 582                         | <b>509</b>             | 58                          | 155                                  |
| Kenya         | 546                         | <b>556</b>             | 51                          | <b>79</b>                            |
| Tanzania      | 546                         | <b>571</b>             | 50                          | 81                                   |
| Mauritius     | 536                         | 435                    | 89                          | 148                                  |
| Swaziland     | 530                         | <b>524</b>             | <b>26</b>                   | <b>47</b>                            |
| Botswana      | 521                         | <b>520</b>             | <b>36</b>                   | <b>78</b>                            |
| Mozambique    | 517                         | <b>523</b>             | <b>16</b>                   | <b>42</b>                            |
| South Africa  | 492                         | 456                    | 70                          | 150                                  |
| Uganda        | 482                         | <b>506</b>             | 41                          | 83                                   |
| Zanzibar      | 478                         | 486                    | <b>20</b>                   | <b>50</b>                            |
| Lesotho       | 451                         | 456                    | <b>17</b>                   | <b>34</b>                            |
| Namibia       | 449                         | 456                    | 48                          | <b>75</b>                            |
| Zambia        | 440                         | 447                    | <b>39</b>                   | <b>72</b>                            |
| Malawi        | 429                         | 437                    | <b>17</b>                   | <b>25</b>                            |
| SACMEQ        | 500                         | 492                    | 41                          | 80                                   |

Source: SACMEQ Data Archive (2004).

Figure: Three Socio-economic Gradient Lines

