SM/15/67
Correction 2

April 2, 2015

To: Members of the Executive Board

From: The Secretary

Subject: **Hungary—Selected Issues**

Board Action: The attached corrections to SM/15/67 (3/13/15) have been provided
                   by the staff:

Typographical Errors   **Pages 7 and 16**

Questions: Mr. Klein, EUR (ext. 36706)
                   Ms. ElGanainy, EUR (ext. 39463)
                   Ms. Jenkner, FAD (ext. 35861)

C. Assessing the Efficiency of Public Spending on Health and Education

7.   A frontier analysis is employed to assess the efficiency of public spending on health and education. It is based on Data Envelopment Analysis (DEA) developed by Farrell (1957) and popularized by Charnes, Cooper, and Rhodes (1978) (see Appendix I). It involves constructing a 'best practice' frontier populated by countries that provide the optimal combination of inputs and outcomes. The country's distance from the efficiency frontier provides a measure of its efficiency—summarized by an efficiency score, which is used to estimate potential gains by improving efficiency to the levels of best-performers. The DEA is sensietive to sample selection and measurement error, thus outliers can greatly influence the efficiency scores.[7] Thus, proper sample selection is critical to ensure that cross-country input-outcome bundles are comparable. The use of an OECD sample in this paper may help alleviate some of these constraints as most of these countries share similar institutional and economic features (i.e., broadly homogeneous in terms of technology and generally follow good practices in terms of data collection—and hence small measurment error).[8]

8.   The analysis focuses on outcomes rather than outputs of health and education to assess the efficiency of these sectors. Performance can be measured by output (quantity) indicators, such as the number of medical treatments and enrollment (and graduation) rates; or outcome (quality) indicators, such as life expectancy and learning achievement (for instance, as measured by performance on standarized tests). The use of outcomes is generally preferrable to the use of outputs (Joumard, 2010 and Grigoli, 2012), as they measure the overall effieciency of the system in transforming resources to final outcomes, and take into account elements of quality. As such, outcome indicators are generally considered a better measure for the overall effectiveness of the health care system in improving the health status of the population and that of the education system in the effective transfer of knowledge and skills and hence the quality of teaching and learning, and thus are more directly linked to welfare objectives, human capital accumulation, and growth (Grigoli, (2012); and Sutherland et. al. (2007)).[9] To assess the evolution of expenditure effeciency over time, the analysis is seperated into two time periods, 2000–06 and 2007–12 in the case of the health sector, and 2000–06 and 2007–11 in the case of the education sector. Given the lags between spending and its impact on outcomes, outcomes at the end of each period were used as the outcome indicator associated with the average spending in the corresponding period.

Efficiency of Health Spending

9.   The efficiency of public spending on health in Hungary has improved over the past

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[7] Alternative techniques, such as the Stochastic Frontier Analysis, impose more structure on the data, but require a large panel of data which is often unavailable, and can be computationally challenging as the estimation is amenable to non-convergence.

[8] Nevertheless, results should be interpreted with caution, given the heterogeneity among the OECD countries.

[9] It is important to keep in mind though that outcomes are affected by other factors (beyond efficiency), such as life-style risks, which may bias the results.

hypothetical point F that is calculated as a linear combination of the actual countries B and C.

As a non-parametric approach, the DEA is considered a powerful tool to assess spending effieciency as it does not require assumptions about unknown functional forms or complex distributional properties, which can help avoid some of the econometrics pitfalls. In addition, it is a simple, easy to explain, and allows to benchmark performance between countries. However, the methodology focuses on inputs and outcomes that can be quantified, and thus, it may overlook important factors that are harder to measure and affect outcomes[25]—as such, it considers all deviations from the frontier explained by inefficiency rather than the result of omitted or uncontrollable variables. Further, it assumes that different combinations of the observed input-output bundles are feasible, such that any country could move to the frontier by freely accessing the technology of production and by being unhampered by the country's own idiosyncratic conditions. Moreover, many public policy targets are impacted by private spending, as a result, large differences across countries in public health and education spending could bias the effieciency scores.

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[25] For instance, life style-related risks in the case of health sector and the stronger initial conditions in educational outcomes.