

Level comparison across countries

We used the CCD formula (Caves et al. 1982), derived from the geometric average of bilateral Törnqvist indexes, to compare output and input prices between countries in a given base year (2005). Compared with the multilateral Fisher index, this method has the advantage that a complete matrix of bilateral Törnqvist indexes is not required, but instead a geometric average can be used as a numeraire.

Specifically, the difference between logarithms of the prices of output for any two countries can be expressed as weighted averages of the differences between logarithms of the component prices and the geometric average of component prices for each country. Therefore, relative to the United States in the base year, the output price for other countries in the same year can be written as: The price indexes in Equations (??) and (??) represent the PPP between the currencies of the two countries expressed in terms of agricultural output and input respectively. Finally, the Törnqvist index was used to chain-link the 2005 cross-country comparable prices to construct a time series in each country.