A Family of Superlative Indexes of Output, Input and Productivity

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Abstract: When an index number formula coincides with a theoretical index under some functional form for the underlying aggregator function, then it is called an exact index. When the aggregator function is also a flexible functional form, then the exact index number is called a superlative index. The present paper proposes the quadratic-mean-of-order-r indexes of output, input and productivity on and shows that all index number formulae belonging to this family are superlative indexes. In particular, in the special case when r=2, the resulting index is the famous Fisher indexes of input, output and productivity and so our results generalize the equivalence result between the Fisher and the Malmquist indexes, which is originally derived by Diewert (1992). Our results also give new justifications for output and input comparison and productivity measurement via other interesting indexes where, e.g., the implicit Walsh index.