SOME SCIENTOMETRIC MEASURES
OF PUBLISHING PERFORMANCE FOR 85 HUNGARIAN
RESEARCH INSTITUTES

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A sample comprising the three years publication output (1976–1978) of 85 Hungarian
research institutes was subjected to scientometric analysis. Values of and correlations
between some measures of publishing performance, scientific manpower, and citation
impact were compared across the following research fields: mathematical and physical
sciences, chemical sciences, biological and medical sciences, agricultural sciences, and engi-
neering. A new quality measure of publishing performance, the total impact of the journal
papers of individual institutes has been suggested.

INTRODUCTION

Among the 1463 Hungarian research units recorded for 1977,1 there were 126
(8.61%) research institutes (the others were university departments, industrial labora-
tories etc.). Although their number is relatively low, a considerable proportion
of the Hungarian R&D effort (41.86% of the R&D manpower, 55.31% of the
R&D expenditures) is concentrated in these institutes. Therefore, their perfor-
mane can be considered representative for the whole Hungarian scientific re-
search activity. Quite recently the Science Policy Committee of the Hungarian Gov-
ernment conducted a general survey in order to evaluate the performance of these
research institutes. As part of this survey the scientometric analysis of the publish-
ing performance of 85 research institutes in the three years period 1976–1978
was performed (research institutes engaged in social sciences were excluded). Some
of the results of this analysis were of local interest only, others, however, were of
more general character; they may well serve as a basis for international comparisons.

Several examples of analysis of publication activity of research units are known
from the literature.2–7 Most of these studies are dealing with university depart-

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ments (in one or more subject fields), and almost all end up in some kind of ranking of the units under investigation and in correlating the publication-based rankings with each other and with those based on other measures (peer rating, promotion rating, success in education, research expenditures, etc.).

The main aim of this work is the comparison of publication characteristics of research coming from research institutes, across different fields rather than a comparison or ranking of institutes within certain research fields. To this end, the 85 research institutes were categorized into one of the following five research fields:

1. M/PH: mathematical and physical sciences (12 institutes);
2. CHEM: chemical sciences (10 institutes);
3. BIOL: biological and medical sciences (18 institutes);
4. AGR: agricultural sciences (22 institutes);
5. ENG: engineering (23 institutes).

Measures characterizing the aggregates of institutes in each field were then calculated and compared.

**Materials and methods**

Comprehensive publication lists provided by the institutes under investigation were used as primary data sources. Although these lists were supposed to be prepared according to common standards, serious differences could be found between the individual institutes even in the definition of what might be considered a publication (whether preprints, internal reports, conference abstracts etc. were to be included or not). In spite of this ambiguity, we used the publication lists unaltered in counting the total number of publications (only dissertations and obviously non-technical papers were omitted), firstly, because we guess that even the ways of definition reflect certain real features of the attitudes toward the publication activity within the institutes, secondly, because we also used indicators which were more or less free of this ambiguity of the publication data base.

Data concerning the research manpower were provided by the Science Policy Committee. The number of full-time researchers and of researchers holding scientific degrees (C.Sc. and D.Sc. degrees of the Hungarian Academy of Sciences) in 1978 were used in our analysis.

As a new quality measure of the publication activity the total impact of the journal papers of each institute was calculated. The total impact was defined as the weighted sum of the number of papers, the weights being the Impact Factors of the journal in which the paper in question was published. Impact Factors recorded in the 1978 volume of the *Journal Citation Reports* were used. The total