Trends of the scientific output in five Latin American countries

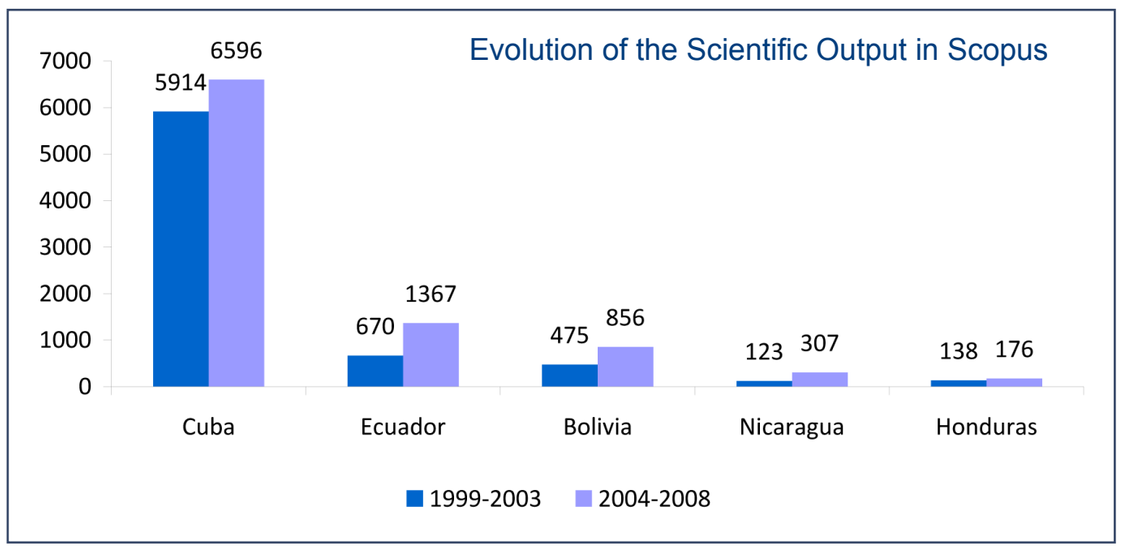
A bibliometric approach

Introduction

This study sets out research trends in Cuba, Ecuador, Bolivia, Nicaragua and Honduras between 1996 and 2008 – a period of rapid growth in research output across the region.

The study answered six key questions:

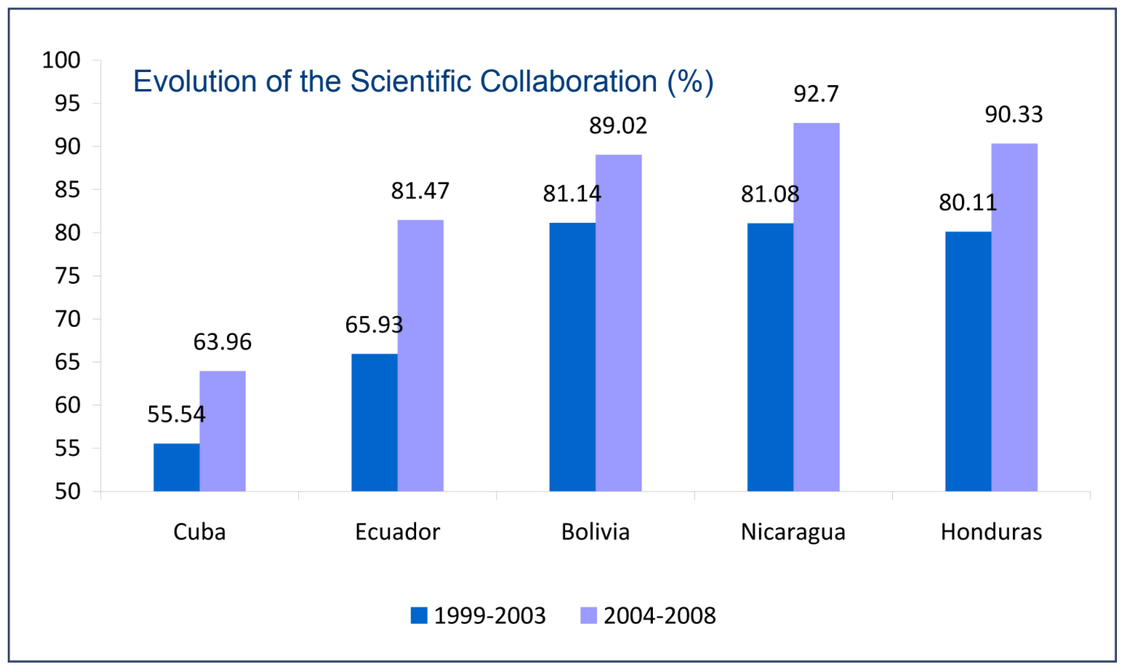
- How have research publication patterns changed over the last ten years in the selected countries?
- What is the number of research publications produced per country per year?
- What are the top research institutions in each country, as ranked by publication output?
- What is the breakdown of research publications by subject area?
- How has this research been cited by others in their research publications?
- What are the changing patterns of international research collaboration, as indicated by multi-author publications with different country affiliation per author?



Why Latin America?

Latin America is of particular interest, not only because the five countries in the study partake in initiatives by INASP and other organisations that promote the importance of research, but because the region experienced unusually high rates of scientific research growth during the study period. During this time, scientific production increased internationally by 67.8 per cent. For Latin America, the figure was 190.5 per cent.

Furthermore, scientific production increased year on year during the study period, and almost 70 percent of its published articles were cited at least one time. Three times more articles were published in Latin America in 2008 than in 1996, and in 2006, 2007 and 2008 it published more than 3 per cent of the world's scientific production.



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To get a more detailed understanding of developments, the study contrasted research activity and visibility in the studied countries with those of a control group of eight countries at a similar level of development in Latin America (Guatemala and El Salvador), Asia (Bangladesh and Vietnam) and Africa (Ghana, Kenya, Rwanda and Tanzania). This enabled findings to be compared to trends not only at a regional level but also internationally.

Research took a bibliometric focus, concentrating on articles from high visibility journals taken from Scopus, the main Elsevier database for bibliometric research purposes, the scientometric tool SCImago Journal & Country Rank and the SCImago Institutions Rankings, the most recent tool created by the SCImago Research Group. Articles were assessed using:

- quantitative indicators measuring a country's entire scientific publication (including total publication output and growth rate)
- qualitative indicators to gauge the impact of research (including average number of citations by document and H-index).

Countries	Research Output	International Collaboration	H-index
Bolivia	1584	85.61%	43
Cuba	15153	58.03%	66
Ecuador	2422	70.00%	55
Honduras	394	85.20%	28
Nicaragua	529	87.63%	28

Key Findings by Country

Cuba

Cuban scientific production has a clear biomedical orientation. The most active and visible areas of research are pharmacology, toxicology and pharmacy, immunology and microbiology, agriculture and biological sciences, chemistry and biochemistry, genetics and molecular biology.

Ecuador

Medicine and agriculture and biological sciences are the two main subject areas in Ecuadorian scientific production. The greatest output is in agriculture and biological sciences, environmental sciences, earth and planetary science, immunology and microbiology, and physics and astronomy.

Honduras

In Honduras, agriculture and biological sciences is the most productive, active and visible research area. Other high performers include immunology and microbiology, economy, econometrics and finance, environmental sciences, neuroscience, medicine and veterinary science.

Nicaragua

Medicine is the most productive subject area for Nicaragua. The best performances are mainly achieved in environmental sciences, immunology and microbiology, agriculture and biological sciences, earth and planetary science, social science and medicine.

Bolivia

Bolivian scientific production is mainly concentrated on agriculture and biological sciences, although environmental sciences, immunology and microbiology, earth and planetary science, veterinary and social sciences are also highly productive and visible.

Implications

The detailed findings of the study provide invaluable data for decision-makers within the five countries featured in the study. It is hoped that these findings will contribute to broader research into the changes in scientific output in developing countries to:

- provide data to inform future policy-making;
- create firmer links between trends in scientific output and policy decisions; and
- gauge the impact of specific policy decisions on scientific output.

However, the study also has implications for organisations across the globe, such as INASP, that are devising strategies for supporting the growth and dissemination of research in developing countries in that it demonstrates the value of bibliometric indicators in research evaluation policies.

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The full report is available at: http://www.inasp.info/bibliometrics

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