

Research collaboration between Germany and South Africa

An analysis of collaboration trends between 2012-2021

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Germany-South Africa research collaboration

Germany and South Africa have a long bilateral relationship in higher education and research.

The two countries signed an agreement on cultural, scientific and technological cooperation in 1998, and this has contributed to the expansion of international research collaboration between universities, research institutes, academics and researchers from the two countries.

Germany sees South Africa as one of the most important partners in sub-Saharan Africa, while South Africa sees Germany as one of its key global partners.



German higher education system

The German HE system is highly diverse; it consists of universities, universities of applied sciences, non-governmental research organisations and institutes.

‘Because of the presence of the strong non-university sector, which is regarded as one of Germany’s central strengths, the German science system is - measured by SCI/SSCI publications - among the largest in Europe, the second largest after the UK’ (Schubert & Sooryamoorthy, 2010).

In recent years, German HE system has developed a growing strategic interest in international collaboration, also driven by EU funding policies that strongly promote internationalization, specifically in the EU (Kwiek, 2021).

In general, there is a high number of academics collaborating internationally in research across Europe, yet Germany is among those that lag in internationalization, with 48% of all academics collaborating internationally (Kwiek, 2015).



Regions of collaboration for German HEIs

Nowadays, German HEIs have a strong focus on collaborations with other HEI in Europe and the United States.

A growing trend towards internationalization has also led to the identification of new partner regions, including countries in the Global South; collaborations with these regions are also supported in specific funding schemes, e.g., by the EU or the German Academic Exchange Service (DAAD).

From a historical perspective, one also needs to take into account that before the reunification of East and West Germany, 'East German universities collaborated closely with the Soviet Union ... and the rest of the Communist block, the West German universities collaborated largely with the Western European countries and the United States' (Luukkonen, Persson & Sivertsen, 1992).



South Africa's international research collaboration

During apartheid, South Africa's historically white universities collaborated predominantly with the Global North.

Since 1994, the higher education system and institutions continued to favour collaboration with the Global North, with limited research collaboration with the African continent and other parts of the Global South.

A study of the trends in South Africa's international research collaboration (IRC) between 2012-2021 by Heleta and Jithoo (2023) highlights that over this period, 48.1% of the country's research output was produced through international collaboration. Since 2012, research output produced through IRC has been increasing significantly, from 42.4% in 2012 to 54.1% in 2021.

Over the past decade, South Africa's public universities have collaborated largely with the Global North (64%), while the IRC with the Global South amounted to 36%. During this time, collaboration with the rest of the African continent amounted to only 13% of the overall IRC by South African universities.



Germany-South Africa research collaboration: Similarities, asymmetries, hierarchies

With regard to the overall research output, there have been increasing numbers of publications between 1980 and 2007 in both Germany and South Africa. In this period, 'South Africa passed through several ups and downs while Germany's trend was more uniform' (Schubert & Sooryamoorthy, 2010).

Before 1990, South Africa collaborated significantly with West Germany. At that time, West Germany was South Africa's third largest international collaborator after the US and Britain, while collaboration with East Germany was negligible (Luukkonen, Persson & Sivertsen, 1992).

Since the early 1990s, in both countries, HEIs have tended to collaborate primarily with the US and European countries.

There is an important asymmetry in the bilateral collaboration: Germany is South Africa's third most important partner, but South Africa is only Germany's 46th most important partner.

As we will show in our presentation, large, traditionally prestigious universities in Germany lead the collaborative efforts with South Africa. Similarly, in South Africa, the largest and wealthiest historically white universities dominate collaboration with Germany.



Purpose of our research

There have been numerous funding initiatives and collaborative research projects and programmes between Germany and South Africa since the mid-1990s.

However, there is limited published research on the trends and patterns in international research collaboration resulting in co-authored scholarly publications between the two countries and their academic and research institutions.

Our research project aims to address this gap in research and provide a comprehensive bibliometric analysis of Germany-South Africa international research collaboration (IRC) trends, with the focus on collaboration during the last decade.



Research objectives

Using the Scopus bibliometric data, we will explore international research collaboration trends between Germany and South Africa. Through an analysis of 14,211 co-authored publications indexed by Scopus for the 2012-2021 period, our research objectives are to:

- Analyse research collaboration trends between German and South African institutions and scholars, including the identification of institutions that have contributed the most to co-authored scholarly output;
- Identify other countries that participate in IRC between Germany and South Africa (where collaboration includes other countries) and provide an analysis of these trends;
- Identify and analyse fields of study that resulted in co-authored scholarly output.



Methodology

Bibliometric analysis is an important and widely used methodology for the analysis and assessment of research performance (Kwiek, 2021), including the research collaboration trends for countries and institutions.

We accessed publication sets from Scopus for the two countries for the 2012-2021 period.

The data included all academic fields and all co-authored publications by academics and researchers working at or affiliated with the German and South African universities indexed by Scopus.

The publication sets were first analysed on the Scopus' SciVal online platform, and relevant data was exported to Excel for an in-depth analysis of IRC trends.



Previous research

Limited research exists that analyses and compares Germany-South Africa international research collaboration trends.

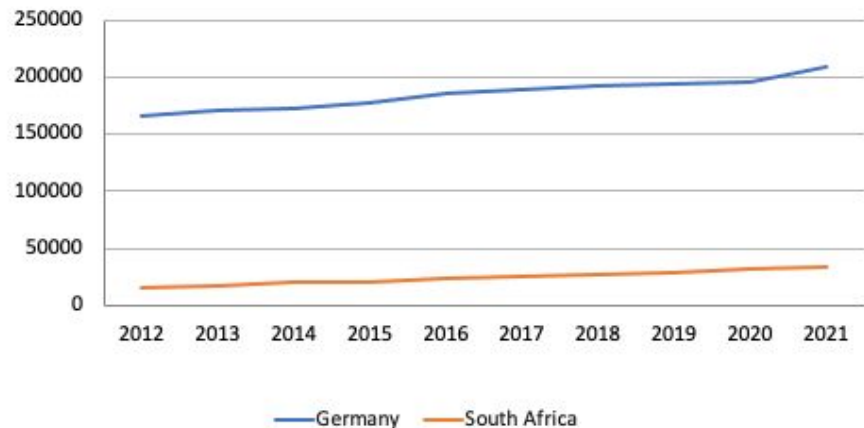
A paper by Luukkonen, Persson and Sivertsen (1992) highlights that during the 1981-1986 period, South Africa had significant research collaboration with West Germany, which was South Africa's third largest international collaborator after the United States and Britain, while the collaboration between South African and East German universities was negligible.

A study by Schubert and Sooryamoorthy (2010) analysed bibliometric data to assess the IRC between Germany and South Africa during the 1980-2007 period. They identified broader research collaboration trends and patterns for both countries, as well as the collaboration trends between Germany and South Africa.

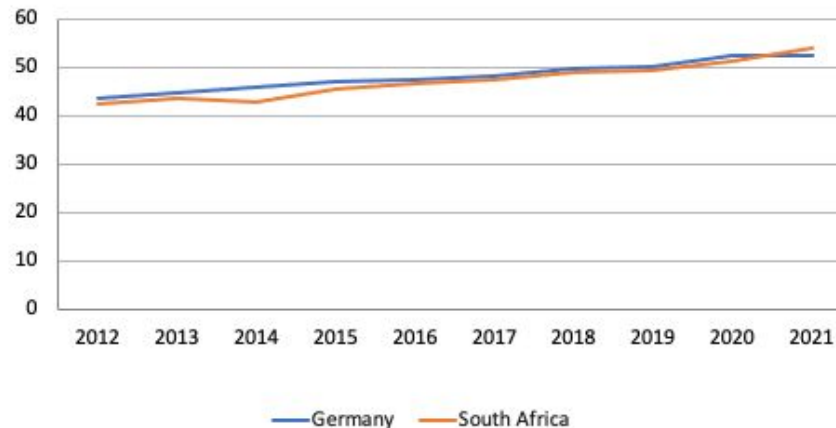


Bibliometric data analysis

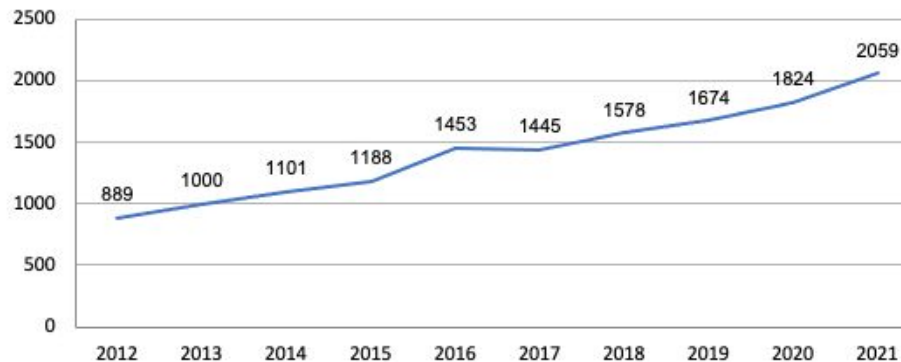
Total scholarly output by Germany and South Africa - number of publications (2012-2021)



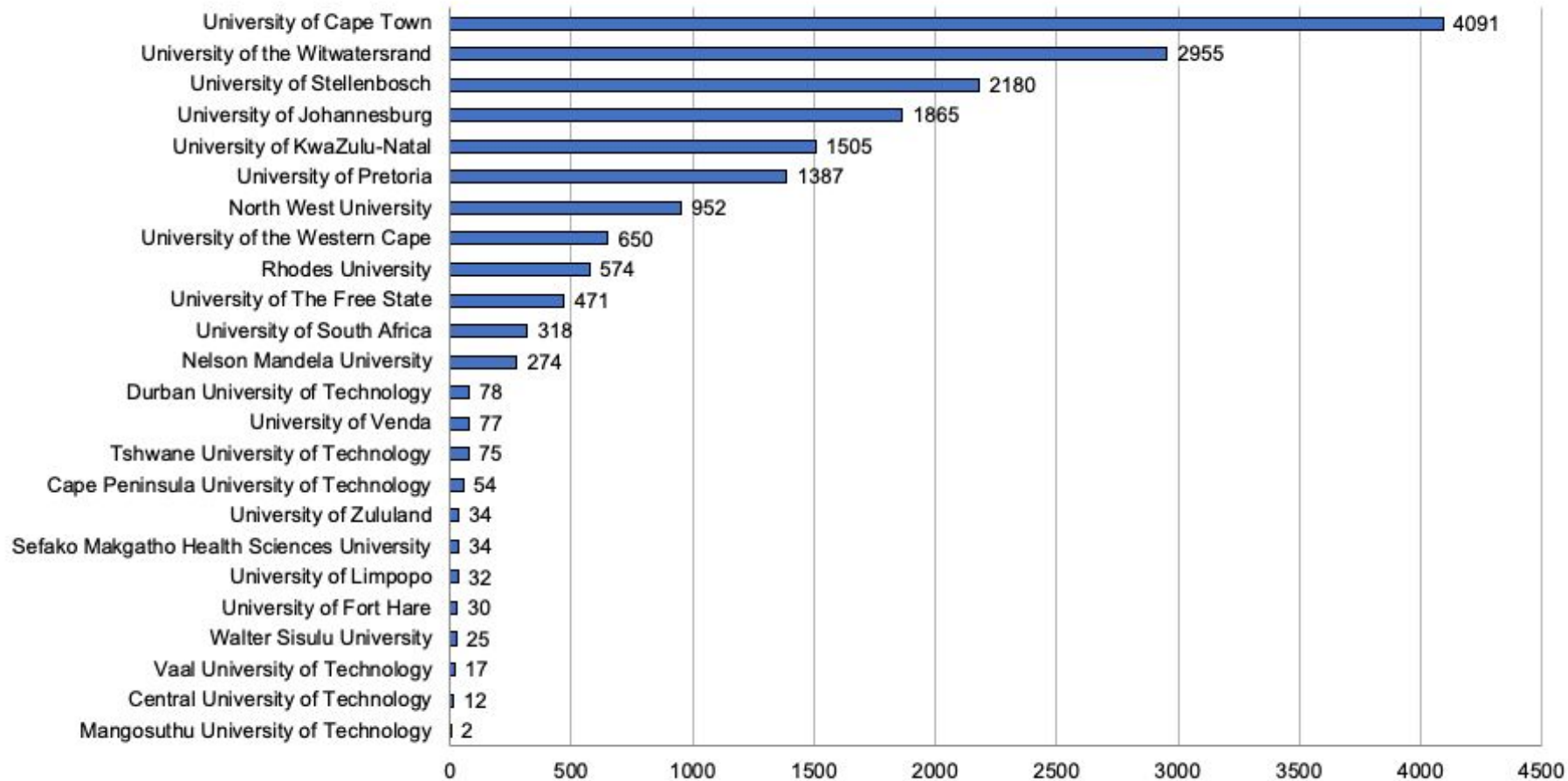
Annual international research collaboration trends - IRC as % of total scholarly output (2012-2021)



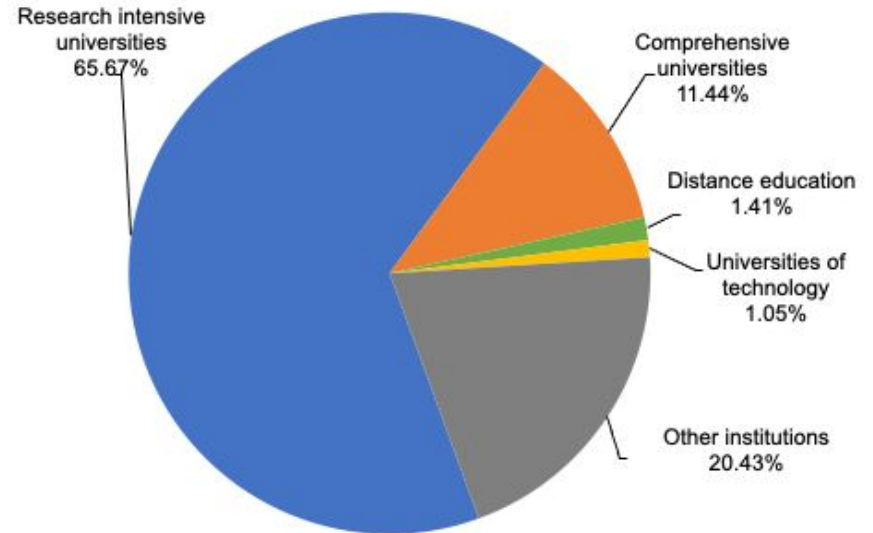
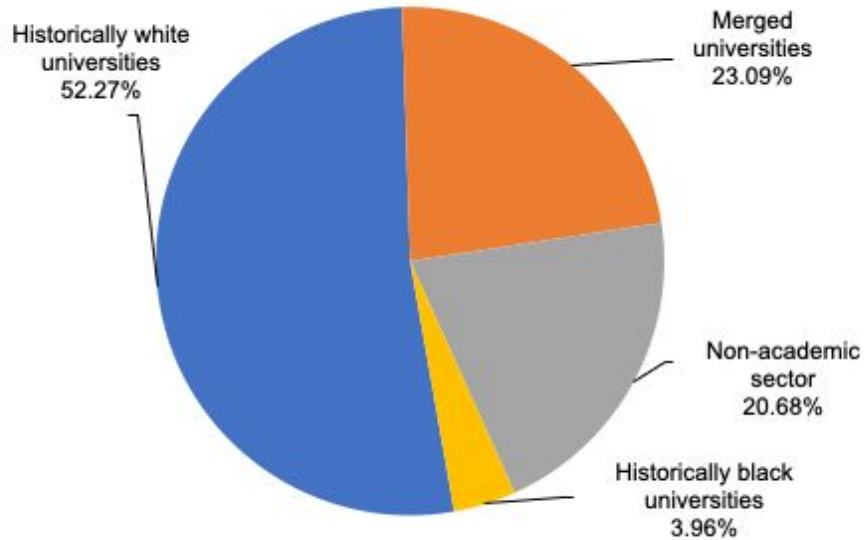
Annual Germany-South Africa IRC trends - number of co-authored publications (2012-2021)



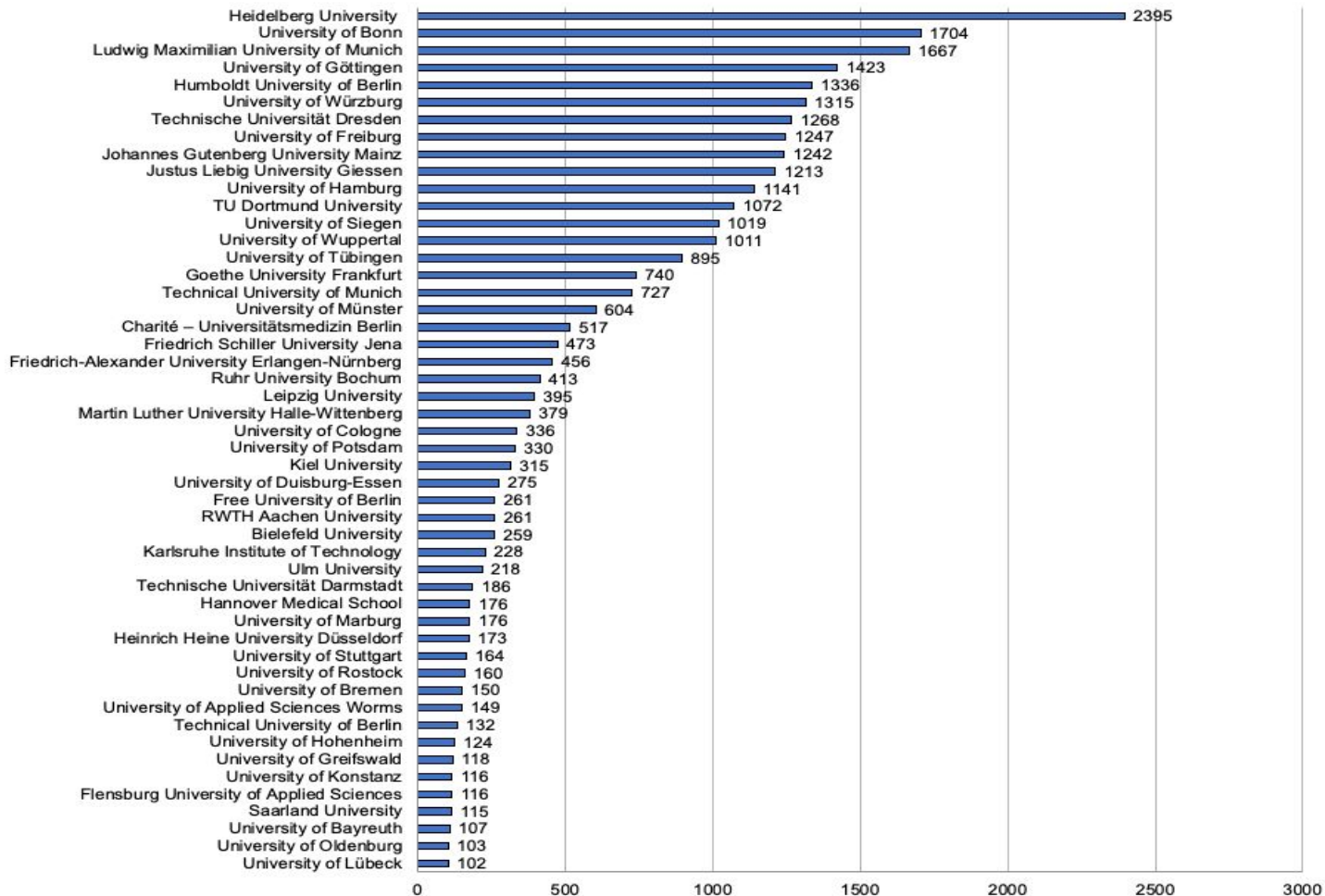
Top South African institutions collaborating with Germany. Number of collaborative publications. 2012-2021



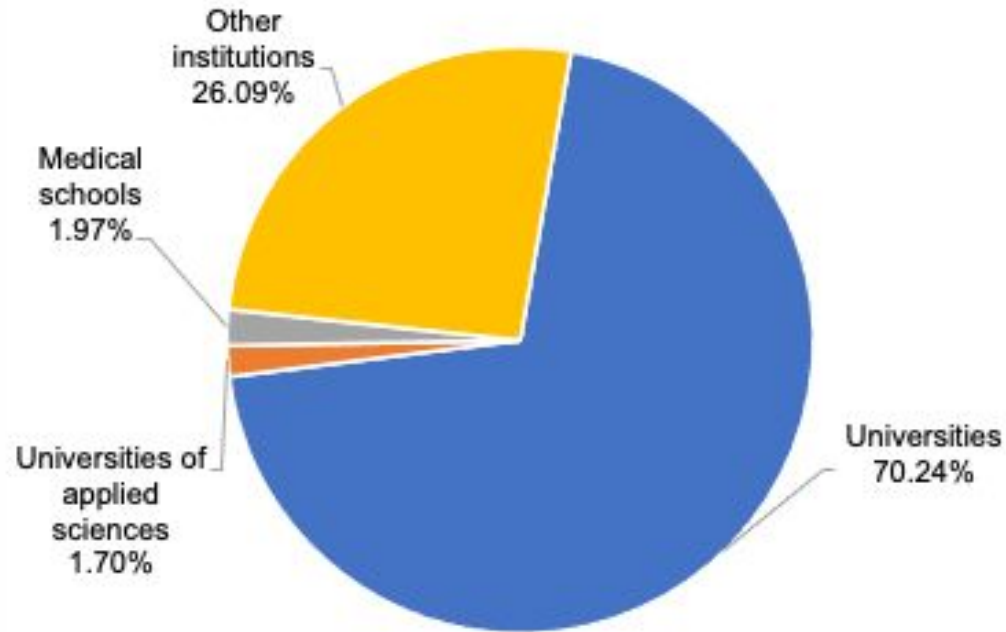
South African trends in collaboration with Germany



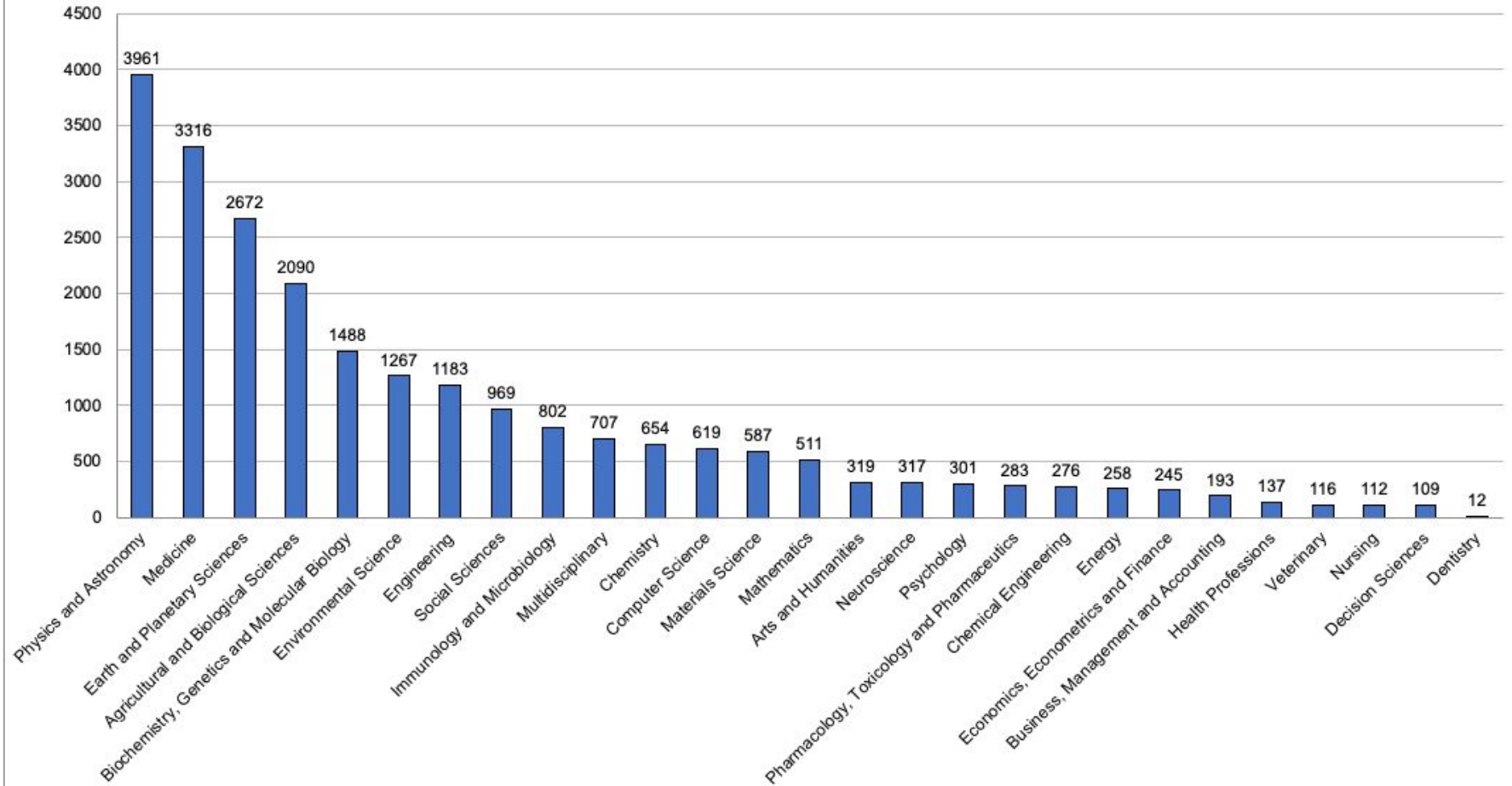
Top German institutions collaborating with South Africa. Number of collaborative publications. 2012-2021



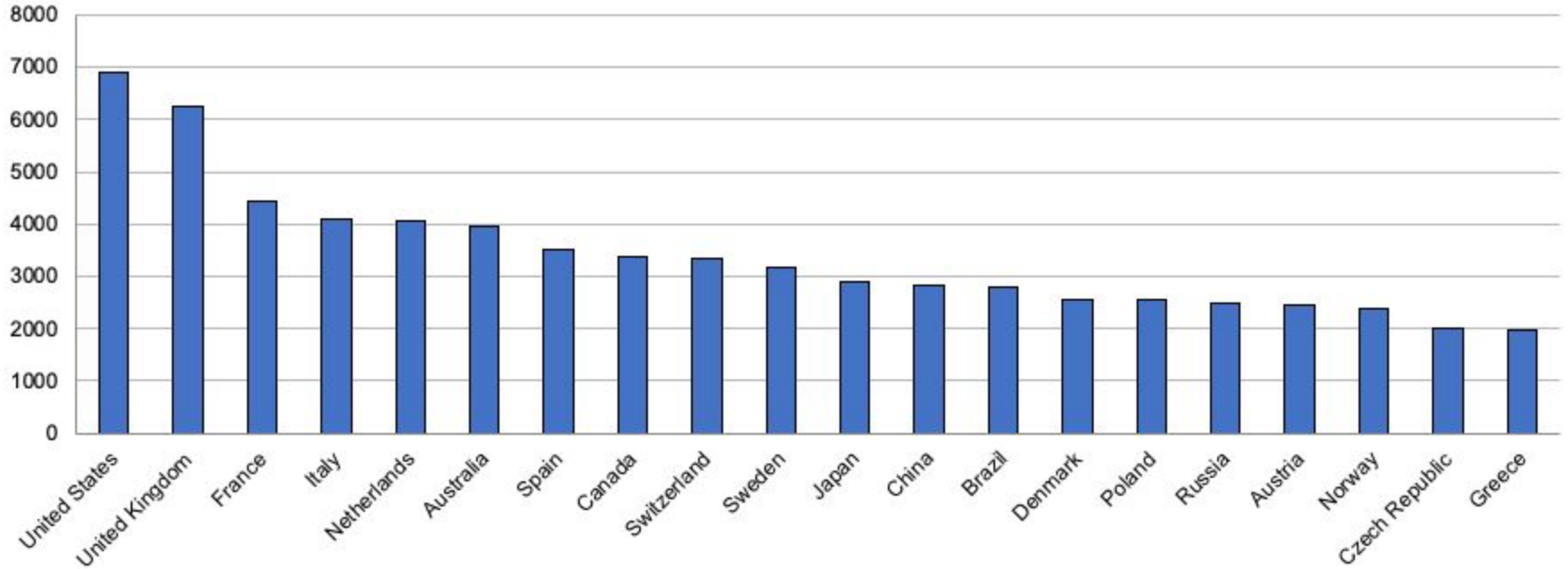
German trends in collaboration with South Africa



Subject areas in research collaboration between Germany and South Africa (2012-2021)



Top 20 countries collaborating with Germany and South Africa on scholarly publications (2012-2021)



In top 10 countries collaborating on scholarly publications with South Africa and Germany are only countries in the Global North. Most countries in top 10 are in Europe.

The first African country is Marocco at 39, then Nigeria at 54, Kenya at 56, Egypt at 60; the first South African neighbour is Namibia at 68, then Mozambique at 88, Botswana at 93 and Zimbabwe at 95.

Key findings

In South Africa, collaboration with Germany is dominated by 'top 10' - these universities contribute 94% of research collaboration with Germany. Other 14 universities indexed by Scopus contribute only 6%.

In Germany, 'top 10' universities contribute 48% of research collaboration with South Africa. Other 109 institutions contribute 52%.

During apartheid/Cold War, collaboration was predominantly between white universities in South Africa and West German institutions. To a significant extent, these trends continue in both countries, with limited involvement of historically black universities in South Africa and universities in formerly East Germany.

In both countries, collaboration is dominated by research universities. Universities of technology in both countries contribute only around 1% to research collaboration.

Other sectors (research institutes, government agencies, business sector) contribute significantly to the IRC (26% in Germany; 21% in South Africa).

When it comes to the subject areas, Germany-South Africa research collaboration is dominated by science, medicine/health sciences, engineering and social sciences. Arts and humanities lag behind.

When other countries are involved in collaboration with Germany and South Africa, these are largely in Europe and elsewhere in the global North. While Germany 'brings in' neighbouring countries, South Africa does not.



Importance of our research

The findings of this study provide an important snapshot of the past decade of Germany-South Africa IRC that resulted in co-authored scholarly publications.

The findings illuminate which institutions (both in Germany and South Africa) consider the research collaboration between the two countries particularly significant and participate in co-authorship of scholarly output, and which do not.

The data also allows us to identify certain patterns of development in IRC between the two countries.

The study and the findings will be important for higher education and research institutions in Germany and South Africa, the governments, funders of research and collaboration (such as DAAD and NRF), and the ministries of higher education and research.



Limitations of the research

While bibliometric data provides an important snapshot about international research collaboration that results in co-authored scholarly output, it does not present a full picture about internationalisation and international collaboration.

A lot of international collaboration does not result in scholarly output but remains valuable.

Bibliometric data can show us trends and what is happening, but cannot tell us why are trends the way they are.

In addition, our research only showcases the international research collaboration indexed by Scopus. This way some Germany-South Africa IRC, not indexed by Scopus, is neglected.

Our research provides one specific glimpse into a complex scenario that is international research collaboration. Further analysis and research require other methods and other data generated through other methods (i.e. more qualitative approaches such as ethnographies, discourse analysis, etc.). We plan to work on this in the future.



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