

# Which collaborating countries give to Turkey the largest amount of citation?

Bárbara S. Lancho Barrantes

*b.lancho@csic.es*

Spanish National Research Council (CSIC), Agustín Escardino, 7. 46980 Valencia (Spain)

## Introduction

In the scientific world it is recognized that high levels of collaboration, but particularly international scientific collaborations, lead to increase in citations, a better quality of the papers published, and a greater productivity of the authors (Leimu & Koricheva, 2005; Hsu & Huang, 2010).

However this citation increment may vary across nations. For various reasons, there might exist differences on the type of collaboration due to countries and their size (Zhao & Guan, 2011).

Therefore in order to study this phenomenon will concentrate on the scientific collaboration between Turkey and the nine most productive countries in the world in 2004 (USA, China, Japan, UK, Germany, France, Canada, Italy, Spain). When considering these countries, the following concerns emerge:

## Research questions

Which countries are working more closely with Turkey? From which countries does Turkey receive more citations? How are the averages in terms of references made by Turkey to collaborators? The main idea examined in this work revolves about the increase in citations occurring when Turkey collaborates with a certain country, since the increase in received citations would be higher compared to a scenario in which the cooperation with such nation had not taken place. Particularly, percentage of citation increase is analyzed through the number of citations received by Turkey from collaborating countries and through the number of references given by Turkey to the nine collaborating countries.

## Data and Methods

The same data and indicators from the studies Lancho et al. 2013; and Lancho, Guerrero & Moya, 2013 were used for this analysis.

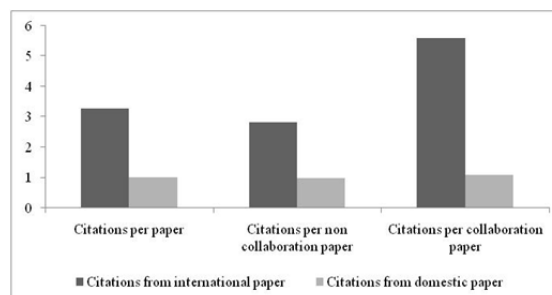
The main indicators used are as follows:

- Citations per paper: Average citations received by the papers published in 2004 within papers from 2005–2007.
- References per paper: Average references given by papers published in 2005– 2007 to papers from 2004.

- Citation Rate Increment from the Collaborator (CRIC): Citation Rate Increment Average when Collaborating (CRIAC), and the Citation Rate Increment obtained from its Collaborators (CRIOC).

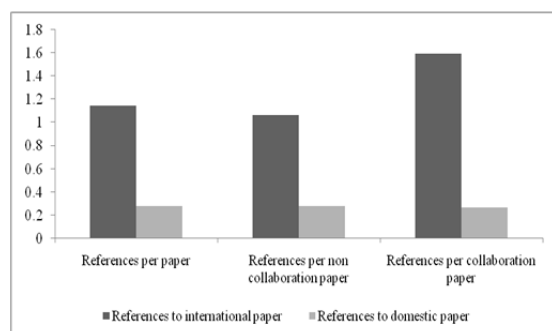
## Results

The total number of documents belonging to Turkey during this time period was 18170. 3043 papers (16.74% of the total number of papers) were produced from collaboration with one or more countries.



**Figure 1. Comparison among the different averages in terms of citations made to Turkey, distinguishing in both cases between domestic and international articles.**

The number of citations per collaboration paper is significantly bigger than those of the citations per non-collaboration paper and citations per paper, being international papers the root where this difference is originated.



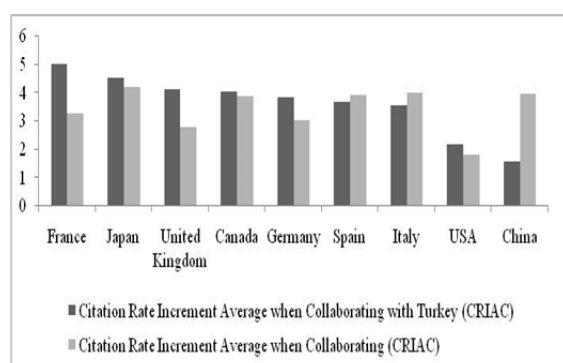
**Figure 2. Comparison among the different averages in terms of references made by Turkey, distinguishing in both cases between domestic and international articles.**

The number of references per collaboration paper is larger than the one registered by references per non-collaboration paper and references per paper in general. Although these percentages are not much different from each other it notices a slight benefit when collaborating.

**Table 1. This chart is referred to the total production in collaboration with Turkey and the total citations made to documents in collaboration with Turkey.**

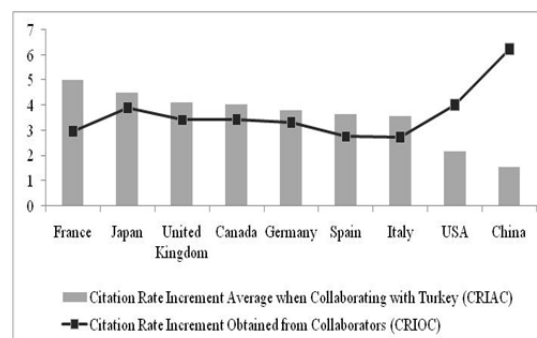
Country	Papers with different countries	Citation to collaboration documents	Citations from collaborators
United States	1368	9206	3978
United Kingdom	411	3082	721
Germany	345	2738	543
France	163	1735	318
Japan	157	869	127
Italy	150	2223	334
Canada	126	963	112
Spain	69	1234	146
China	34	527	53

By observing the above illustration, the United States is the country with which Turkey collaborates more, following this United Kingdom and Germany. And these are the countries that Turkey most benefits from reflected in Citations to collaboration documents and Citations from the Collaborators.



**Figure 3. Comparison between CRIAC in general and CRIAC with Turkey.**

On a general basis, except in some cases, the increase in citations arising out from collaborating countries is higher in Turkey than in a general study.



**Figure 4. Comparison between the CRIAC with Turkey and the CRIOC among the nine countries with the largest production in 2004.**

Values for the CRIAC were higher in some countries than in others in comparison with CRIOC.

### Interpretation

Turkey is a country presenting large levels of production, but it has a very low percentage of documents done in collaboration. However, its citation percentage received from its collaborations with countries having larger productions and more collaboration, such as France or Japan it quite high. If Turkey is involved in collaborations, it receives a positive Citation Rate Increment from the Collaborator (CRIC).

However, Turkey does not receive the same Citation Rate Increment Average when Collaborating (CRIAC) from all the countries. For instance, the largest increases in citations are registered in France, Japan, and the UK.

Finally, this study is only an approximation of how Turkey collaborates and from which it is revealed interesting data that could be developed by a broader study in which more countries and scientific disciplines could take part.

### References

- Hsu, J.W., & Huang, D.W. (2010). Correlation between impact and collaboration. *Scientometrics*, 86(2), 317–324.
- Lancho-Barrantes, B. S., Guerrero-Bote, V. P., Chinchilla-Rodríguez, Z., & Moya-Anegón, F. (2013). Citation flows in the zones of influence of scientific collaborations. *JASIST*, 63(3), 481–489.
- Lancho-Barrantes, B. S., Guerrero-Bote, V. P. & Moya-Anegón, F. (2013). Citation increments between collaborating countries. *Scientometrics*, 94(3), 817 - 831.
- Leimu, R., & Koricheva, J. (2005). Does scientific collaboration increase the impact of ecological articles? *Bio Science*, 55, 438–443.
- Zhao, Q., & Guan, J. (2011). International collaboration of three 'giants' with the G7 countries in emerging nanobiopharmaceuticals. *Scientometrics*, 87(1), 159–170.