

# The scientific output of the University of São Paulo between 2000 and 2009: a comparison approach

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## Introduction

The degree of excellence of a High Education Institution may be evaluated using different ways. However, the assessment of reliable data for such evaluation can be a complex task. The "scientific output" criterion is the most easily measured, mainly due to the availability of online tools (databases) that allow to obtain bibliometric data. Such data provide quantitative and qualitative information on the scientific output of HEIs and is widely used by funding agencies, academic institutions and even corporations, for planning and policy management.

## Purpose

The aim of this work was to conduct the assessment of the scientific output of the Universidade de São Paulo (USP) during the decade 2000-2009, by comparing the collected data with data obtained for the University of Stanford and University of Tokyo, in order to evaluate USP performance and an overview of its scientific output.

## Methods

We used WoS database considering the following criteria: total number of indexed articles per year and citations per paper (CPP), using two search options of WoS, separately: a) the Social Sciences Citation Index (SSCI) along with the Arts & Humanities Citation Index (A&HCI),

herein referred as Social Sciences, Arts and Humanities (SSAH), and; b) the Science Citation Index Expanded (SCI-EXPANDED), herein referred as Exact and Earth Sciences, Biology, Medicine, and related biological fields (EESBM). Data were collected using each one of these choices, separately, searching for specific HEIs (USP, Stanford and Tokyo) outputs, year by year. As a comparative measure of the scientific output between institutions, we introduced the criterion "percentage of citations per paper" of a HEI relative to another (defined by the equation  $CPP\ HEI_1 \times 100 / CPP\ HEI_2$ )<sup>48</sup>.

## Results

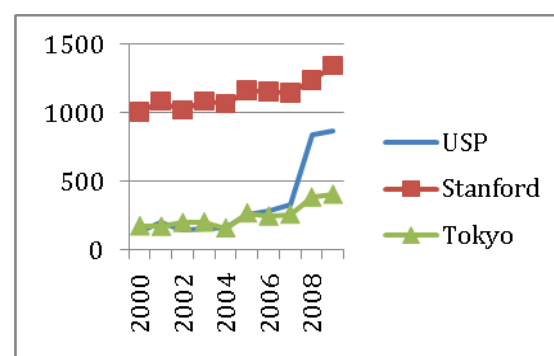
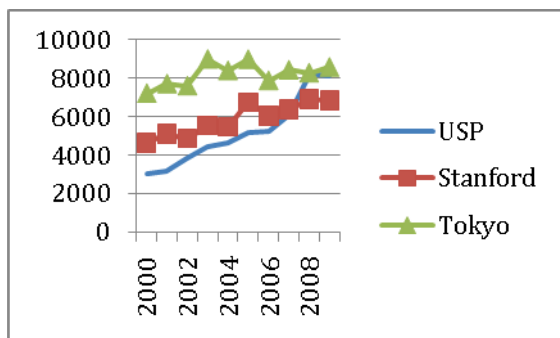
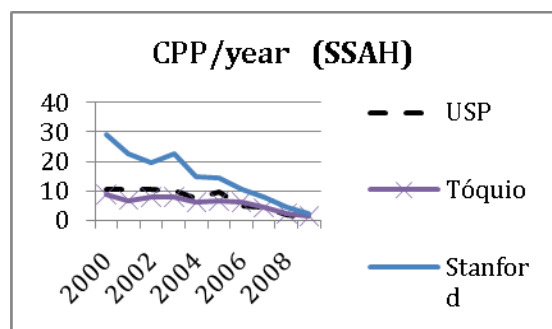


Figure 1. Number of papers per year within SSAH (2000-2009)

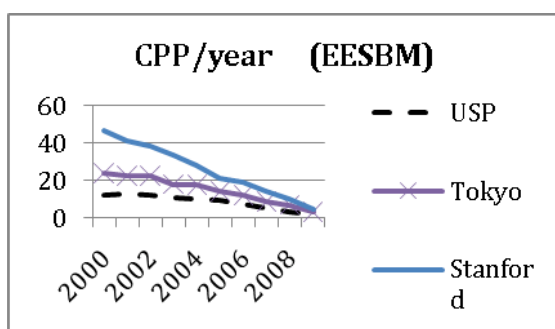
<sup>48</sup>For example, comparison of the scientific output of USP related to the Stanford University in terms of citations per paper was calculated for each year, using the following formula:  $CPP (USP) \times 100 / CPP (Stanford)$ .



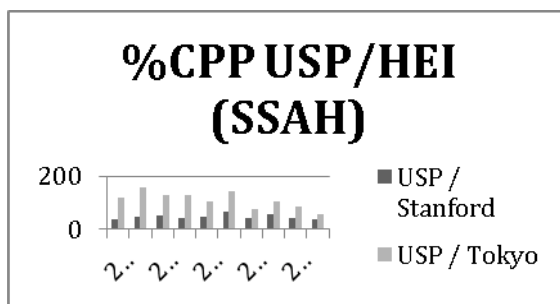
**Figure 2. Number of papers per year within EESBM (2000-2009)**



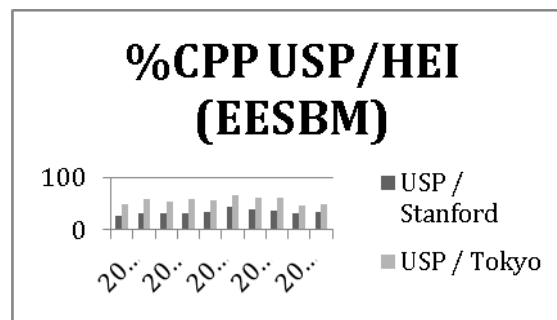
**Figure 3. CPP per year within SSAH (2000-2009)**



**Figure 4. CPP per year within EESBM (2000-2009)**



**Figure 5. % CPP USP/Stanford and USP/Tokyo per year within SSAH (2000-2009)**



**Figure 6. % CPP USP/Stanford and USP/Tokyo per year within EESBM (2000-2009)**

### Discussion

The number of articles published and indexed in the WoS/year shows that within both SSAH and EESBM there was an increase in the scientific output of the three HEIs during the last decade. Interestingly, the increase of the scientific output within SSAH over the decade is more significant than that of EESBM for all HEIs. The CPP metric follows the normal trend in decrease when measured more recently. Although the CPP is an index under questionable criteria (Velho, 2008), it is an indirect measure of the relevance and visibility of the scientific output. Within SSAH, the CPP of USP over the last ten years is relevant when compared with University of Tokyo's CPP. Both USP and Tokyo native languages are a limiting factor to attract citations, fact recognized as particularly significant (van Raan, van Leeuwen & Visser, 2011). Within the EESBM, the USP CPP is clearly below Stanford and Tokyo CPPs. This result is possibly due to the respective countries local science policies over many years, which results in a sounding research support in these areas of science.

Looking at the %CPP USP/HEI, the results indicate a regularity of the USP scientific output related to Stanford and Tokyo, with CPP at an average of about 47% relative to Stanford over the decade. When compared to Tokyo, the USP output is quite similar within SSAH between 2000 and 2006 (over 100%, as it can be verified in Figure 3). Within EESBM, the relevance of USP

output related to Stanford and Tokyo (in terms of % CPP) is in a much more regular basis: about 34% compared to Stanford with a slight tendency to increase in the last years, and about 55% compared to Tokyo, reaching a "peak" of 65% in 2005 (Figure 6). Although there has been an increase of USP scientific output indexed in WoS over the decade, this has not occurred with respect to the relevance of USP scientific output. However, the relevance metric indicator herein introduced ( $\%CPP\ HEI_1/HEI_2$ ) shows that, when considering USP scientific output related to Stanford or Tokyo, this indicator has not dropped.

### Conclusions

The analysis herein reported provided an evaluation of USP scientific output related to Stanford University and to the University of Tokyo during the 2000-2009 decade. The results obtained indicated a regularity in the growth of USP scientific output indexed in WoS. However, this trend has not been translated in the relevance of the scientific output. While the relevance of the scientific output of USP related to the University of Tokyo within SSAH has slightly diminished during the last years of the decade, it remained rather stable when compared to Stanford. In the case of EESBM, the scientific output of USP presented a tendency of stabilization over the decade, with a slightly increase in recent years. The results herein observed may be a result of a stronger and more efficient funding support provided by Brazilian funding agencies during the last decade.

### References

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- Velho, L. (2008). Por um olhar brasileiro na ciência (Entrevista). *Pesquisa FAPESP*, 143, 2. Retrieved 01 February 2011 from [http://revistapesquisa.fapesp.br/?art=3423&bd=1&pg=1&lg=.](http://revistapesquisa.fapesp.br/?art=3423&bd=1&pg=1&lg=/)