Innovation by Sector in the Community of Madrid (1996-2007)

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Introduction

Patent metrics, a especialized area or Information Metrics, contributes to the purposes of competitive intelligence by analyzing trends in technological development and the transfer of research findings from science to engineering and society.

Objectives

The present study characterizes innovative capacity in the Community of Madrid by examining its patents and analyzing overall and sectoral trends, as well as the relationship between sectors and subject areas.

Methodology

The source of the information on patents was the Spanish Patent Bureau's (OEPM, Oficina Española de Patentes y Marcas) database on inventions and designs in Spanish: INVENES.

The search criteria used to find records for the CM were "PROV" (applicant's province), time frame (1996-2007) and origin (FCON = Spanish application; and FCOE = European application).

The data output included contingency tables and indicators on patent licensing, yearly trends in patent numbers (including index numbers), innovative sectors and subject areas. In addition, correspondence analysis (CA) was used to map yearly results by sectors, along with the subject areas where patents are obtained. This analysis was conducted with $Xlstat^R$ statistical software.

The International Patent Classification (IPC) level was used for the subject area breakdown.

Results

A total of 9 279 patents were retrieved, for a yearly mean of 773,25. The fairly large standard deviation (s=98.53) found was indicative of substantial data dispersion.

The index numbers used to describe the changes in the "number of patents" variable throughout the study period showed declines with respect to the base year, the first of the seires, in the 2000, 2002, 2006 and 2007.

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A breakdown of the data by the sectors lodging patent applications in the CM revealed differences in trends. Values lower than the base year were not recorded for either the CSIC or the universities and the figure for OPIs dipped under that level only once. However, individual and enterprise patent applications slid in several years (Figure 1).
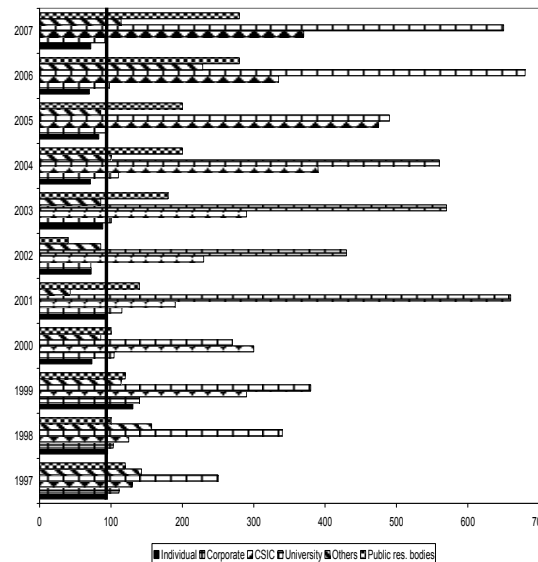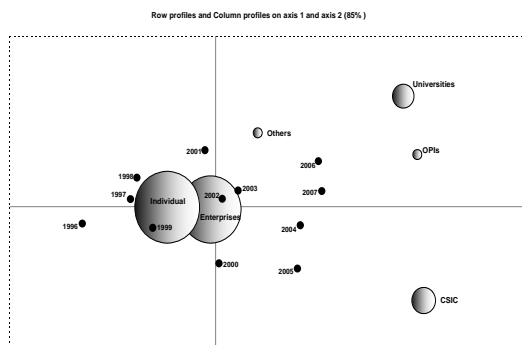

**Figure 1. Index numbers by sectors, 1996-2007**

The sector distribution over time showed that in the last year, universities and public research bodies deployed greater effort than other sectors (Leydesdorff and Meyer, 2007). In turn, the number of enterprise and individual patents remained essentially constant across the 12-year series (Figure 2)

Figure 2. CA of date of patent vs sector

Figure 3 shows the correspondence analysis map between sectors and the subject areas in which patents are sought. The least detailed International Patent Classification (IPC) level was used for the subject area breakdown.

On the whole, the areas accounting for the largest proportion of patents were found in the Human Necessities section (Furniture, Medical or Veterinary Science, Sport, Games…), followed by the Performing Operations and Transporting section. Corporate and individual patents predominated in these areas. The sectors most closely linked to research, in turn (universities, National Research Council and public research bodies), exhibited a more specific profile geared to Chemistry/Metallurgy and Physics.
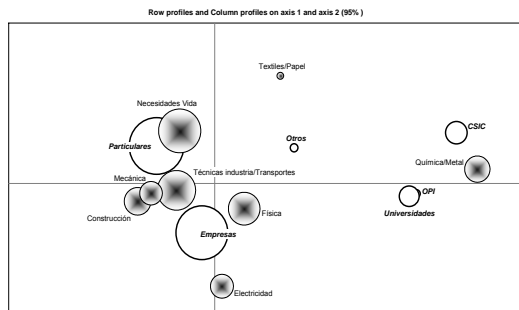
Figure 3: CA of sectors vs IPC subject area

Conclusions

- No increase was observed in the number of patents in the CM during the study period. On the contrary, a slight decline was recorded in four of the years analyzed.
- A sector breakdown showed upward trends for both the universities and the CSIC and a downturn in the number of corporate patents. Universities and OPIs deployed most of their effort in the latter years of the study, while corporate efforts were distributed more evenly, time-wise.
- Corporate patents were granted essentially but not exclusively in Human Necessities areas. Universities, the CSIC and OPIs exhibited a more focused profile, with a preference for Chemistry/Metallurgy and Physics and more specifically organic and inorganic chemistry, biochemistry

Acknowledgments

References

Leydesdorff. L.; Meyer. M. The Scientometrics of a Triple Helix of university-industry-government relations (Introduction to the topical issue). Scientometrics 2007;70(2): 2007-22