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ESGI

European Studies on Gender Aspects of Inventions- Statistical Survey and Analysis of Gender Impact on Inventions

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Main results of Work Report 1 “Analysis of Statistics of Female Inventors in Europe”

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1 Introduction

1.1 Research context

The main aim of the European council, which took place in Lisbon in 2000, was to transform the European Union into the most competitive and dynamic knowledge-based economy in the world by the year 2010. This aim is based on two important pillars: the capacity to innovate and the creation of economic value from technological knowledge (European Commission 2003, 20).

To reach these ambitious goals it is obvious that Europe needs more researchers as they form a key element of the modern knowledge-based economy. Therefore, it is necessary to incorporate the full range of innovative and inventive potential of the society. The transition to a knowledge-based economy will only be successful by incorporating all human resources. Thus, women will have to play an equal part in all sectors of research. To reach these goals the European Commission has implemented gender mainstreaming policies at all levels (European Commission 2005). To endeavour the leading position of the European research area the incorporation of gender in research is seen as increasingly important for innovation and economic success of research based companies and institutions (Bührer and Schraudner 2006).

In innovation literature, a strong link between research and development (R&D) activities and patents is stated. Granted patents are intellectual property rights, issued by patent offices to inventors to make use and exploit the invention for a certain period of time. Patents play a central role in the technical innovation process and are seen as a “key measure of innovative output” (OECD 2004:9) of countries, firms and universities. They are filed in different technological fields and can be used as an indicator for the successful inventive achievement of researchers and engineers. Patent documents are a rich source of information about technical features, inventors and applicants and to document the history of the application filing and granting procedure.

But even though patent filing is strongly linked to research and development activities, patent statistics do not provide gender related data. The European Commission continuously monitors the percentage of female researchers (European Commission, 2006a), yet the innovative and inventive activities of women working in the mentioned fields are not well analysed. Substantial knowledge regarding the proportion and contribution of female inventors in Europe is still missing. On the other hand, this data would allow scientists to draw conclusions on women’s contribution to the production of technical knowledge and therefore highlight their role as knowledge workers in the European knowledge-based society.

The few studies on women as patent inventors which have been performed until now indicate a mismatch insofar, as the percentage of women applying for patents is considerably lower than the percentage of women working in the corresponding fields (Naldi and Parenti, 2002; Greif 2005,2006). These results provide first hints, but no detailed comparison and analysis concerning this question has been done until now. If one summarises the results of these studies, gender differences in inventions have to be considered under-investigated. So far there is no study which covers the inventive

activities of women and men for all 27 European Union Member States and compares these results to the number of women and men working in the corresponding fields.

To fill this knowledge gap, a detailed study focussing on gender aspects on inventions is needed. In view of the actual efforts of the EU to overcome gender inequality in all fields, there is an urgent need to explore the actual situation of women as patent originators and to investigate the reasons of existing inequalities. The present work report therefore focuses on the following main question:

What is the current state of the female contribution of European inventors to patent applications filed at the European Patent Office?

1.2 The ESGI project

This report is part of the ESGI project which started in October 2006 and runs till September 2008. The project is financed by the European Commission under the Sixth Framework Programme and located at Hochschule Furtwangen University in Germany. Within this Specific Support Action the gender impact on inventive activities within the time-span 2001 – 2003 will be investigated.

The ESGI project uses patent applications as an output orientated indicator for the gender specific measurement of inventive activities. The structure of the project consists of two parallel parts which merge into the third part the Gender Impact Assessment:

1. A comprehensive data analysis concerning the female participation and contribution of European inventors and a comparison of these data with earlier studies and statistical data of Eurostat.
2. An online-survey with heads of research and development departments, exploring the innovation climate of European patent applicants.
3. These two parts will finally merge into the third part of the project, the gender impact assessment of the inventive activities of all 27 EU Member States.

2 Summary: Major findings

The following section integrates the main figures of the ESGI sample and briefly presents the central results of the data analysis:

1. **Content of the database:**

The ESGI inventor and patent database consists of 157 645 patent applications to the European Patent Office with priority year 2001, 2002 and 2003. The sample includes the data of 388 844 inventors of which 360 844 or 93% have a residence address in one of the European Union Member States.

2. **Geographical distribution of inventors**

German inventors clearly dominate the European patenting activities. 46.9% of all inventors have a German residence address. Inventors from France count up for 13.6% followed by Great Britain with 10.2% and Italy as well as the Netherlands with 7.0% each.

3. **First name database:**

On the basis of an existing first name database, containing names from six countries, the project developed the extended first name database “FNDB ESGI”. It includes a total of 11 301 names from 27 European countries. FNDB ESGI proved to be an efficient tool for the gender assignment of inventor’s names in the inventor and patent database.

4. **Success rate of gender assignment**

93% of all inventors with a residence address in the EU-27 were classified as male or female. The success rate for the 27 different EU Member States ranges from 100% to 81%.

5. **Share of female inventors**

Out of all European inventors 8.3% are women and 91.7% are men, meaning that out of 10 inventors approximately one is a woman. Pronounced differences between the different countries are found for this indicator. The female proportions ranges from 23.1% for the best achieving country Lithuania to 4.8% for the least achieving country Austria. It stands out that the highest proportions of female inventors are found in the Eastern European Union Member States which in contrast are low in absolute numbers of patent applications. Germany, the leading country in patenting activities in general, reaches a female share of 6.1% only. Thus, this striking disproportion particularly lowers the European average.

6. **Female contribution by country**

The indicator contribution (patent-equivalents) generally is lower than the female share of inventors and sums up to 6.3% for the EU-27 average. These

comparatively lower shares indicate that women invent in larger groups than men do.

7. Female contribution by technical units

All patent applications were allocated to eight sections and 31 technical units. Concluding these findings the dominance of women in section A “Human necessities” and C “Chemistry/Metallurgy” is pronounced. Female researchers invent most often in pharmacy (22.7%) and biotechnology related technologies (22.2%) where approximately one out of four patents is filed by a woman. High rates are also found in chemistry related areas while the female activities are low in the mechanical, construction, physics and electrical sections.

8. Inventors by institutional sector

The business enterprise sector clearly dominates the patenting activities in the European Union since 87.8% of all patents are applied for by inventors from the business enterprise sector. The other sectors reach shares of 3.9% (individuals), 2.0% (higher education), 1.8% (government), 1.9% (private non-public) and 0.1% (hospital). A total of 2.5% inventors could not be allocated to a sector.

9. Female inventors by institutional sector

In the business enterprise sector the female proportion counts up to 7.9%, meaning that out of 100 patents only 12 were applied by women, whereas 88 were applied by men.

10. Patent/Inventor ratio

Compared to the general distribution, women generally apply for patents in those technological areas where larger groups are present.

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