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Gender Budgeting in Scientific Organizations: A Methodological Proposal for Structural Changes

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Abstract: Gender discrimination in scientific careers brings about a waste of talent and limits to innovation and development of society. Budgeting is generally considered gender-neutral, yet it affects men and women differently. Gender budgeting introduces a gender equality perspective into the budgetary process, in order to develop a fair distribution of resources according to gender-specific needs, and to promote structural changes in the organization. A detailed methodological proposal to implement gender budgeting in scientific organizations is presented as part of the results of 7th EU Framework Programme. Gender budgeting implementation in scientific organizations will focus on the allocation of funds, time and space, and on analyzing the whole budgeting process from a gender perspective. Gender budgeting is a crucial tool to change structures and culture in scientific organizations.

Key words: gender budget; gender discrimination; scientific organizations; equal opportunities
JEL code: Z00

1. Introduction

The role of science in society is crucial to the development of countries (European Commission, 2009a), and economic models for long-term growth involve gender equality (OECD, 2008). Nevertheless, gender discrimination throughout scientific careers is particularly prevalent (Committee on Gender Differences et al., 2010, European Commission, 2016): women represent 45% of those who achieve the title of Doctor of Research, but only 30% of active researchers and only 18% of professors (European Commission, 2012; European Commission, 2009b; Blickenstaff, 2005; Blagojević et al., 2004). Gender differences in patenting in the academic life sciences remain large, in spite of some improvement in recent decades (Ding et al., 2006; Whittington, 2011). The gender pay gap is one of the more evident forms of discrimination (Barbezat & Hughes, 2005; Blackaby et al., 2005; Ward, 2001). Stereotypes play a determining role in perpetuating gender discrimination (Noseka et al., 2009; Handley et al., 2015).

The debate at a European level and in the United States highlights that gender discrimination represents not only a problem of inequity, but also an obstacle to the development of research skills and innovation; in short, it is a waste of talent (Committee on Maximizing the Potential of Women in Academic Science and Engineering et al., 2007; Blagojević et al., 2004). In the last two decades, various initiatives have been developed to promote greater

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gender equality in research. Particular attention has been paid to programs aimed at supporting women in their scientific careers. However, the results have thus far been very contained, and have not led to the overcoming of structural cultural discriminatory barriers (Castano et al., 2010; Ceci & Williams, 2011).

Budgeting is generally considered a gender-neutral policy instrument, because its data, expenditure and revenue make no mention of men or women specifically. It thus appears gender-neutral, but only because it usually ignores the different socially determined roles, responsibilities and capabilities of men and women (Elson, 1997). This gender-neutral approach is a taken-for-granted framework that brings about unequal outcomes. While the provisions in a budget may appear to be gender-neutral, they actually affect men and women differently, because their respective roles, responsibilities and capabilities in any organization are never the same. Normal budgeting, therefore, rather than being gender-neutral, must be considered gender-blind (Budlender, Elson et al., 2002).

Financial choices reflect the dominating culture and its related power relationships, as power is created through the concentration of resources. It is important, then, when addressing gender equality, to understand and monitor how resources are distributed, and the effects that each assignment has on each gender.

> "Gender-responsive budgeting (GRB) seeks to incorporate a gender equality perspective into the budgetary process to ensure an efficient allocation of resources based on identified needs, and to restructure revenues and expenditures to strengthen gender equality and women's empowerment. GRB does not involve making separate budgets for men and women, nor does it necessarily mean a radical reform of existing budgetary procedures" (OECD, 2010).

Gender budgeting represents a tool with considerable potential for the promotion of necessary structural changes, enabling a reduction in discrimination also within scientific organizations. However, its application in such organizations is still very limited (Rothe et al., 2008).

The lack of a clear methodology of application could be one of the elements that slow down its diffusion in scientific organizations. Gender budgeting has, in fact, been implemented with some success in public administration bodies at national, regional and local levels of government, permitting the maturation of a series of methodological choices, by now consolidated (Quinn, 2009; Addabbo, Gunluk-Senesen, O'Hagan, 2015). The main gender budget experience (Budlender D., Sharp R., & Allen K., 1998, p. 21) consists in the reclassification of the budget expenditure according to the gender dimension, in three different categories: (1) gender-specific expenditures; (2) equal employment opportunity expenditures (programs aimed at change within government); (3) general expenditures.

Budgeting of scientific organizations involves financial resources from various sources: public national and local funds and external or overseas private funds. Therefore, in order to build upon the previous pioneering experiences (Rothe, 2008), implementing gender budgeting analysis would require a rather elaborate methodology at both theoretical and operative levels. The main research questions addressed in the paper are: What are the methodological tools required to implement gender budgeting in scientific organizations? Focusing on the elements characterizing scientific organizations in particular, what are the main resources that have to be considered in research activities? Given that time allocation among academic faculties presents gender differences, affecting scientific output (Winslow, 2010), should time be considered as a principal resource upon which to focus for gender budgeting implementation in scientific organizations?

The work presents the principal elements to emerge in the process of defining a methodological tool, effective for the implementation of gender budgeting in scientific organizations. The paper is articulated in three

main parts. The first presents the methods used in the process to develop the theoretical and operative methodology; the second shows the main results; and the third discusses them.

2. Methods

The methodological proposal for the implementation of gender budgeting in scientific organizations has been developed as part of the Genis Lab project (2011), which has the objective of implementing certain structural changes in six scientific organizations in Europe, in order to address the factors that limit women's participation in research. The project, financed by the 7th RTD Framework Programme of the European Union and coordinated by Fondazione Giacomo Brodolini (FGB), Italy, began in 2011, and is due to conclude in 2014. The scientific organizations involved are research centres of excellence in Italy, Spain, Germany, Slovenia, Sweden and Serbia.

In addition to the FGB, another two organizations provide technical and scientific support for the realization of the project. These are: ITC/ILO — The International Training Centre of the International Labour Organization (Gender Unit), Turin, Italy, and the Women and Science Association (l'Associazione Donne e Scienza), Rome, Italy.

The methodology for the implementation of gender budgeting in scientific organizations has been developed in four main phases:

(1) Analysis of the literature that has led to the propensity to produce a thematic report on gender budgeting.

(2) Analysis of the results of the Gender Participatory Audit conducted in the individual scientific organizations involved in the project, in order to analyze organizational aspects and human resources from a gender perspective.

(3) The production, by the FGB, of a first draft, outlining a generally methodological approach.

(4) Discussion with partners regarding the methodological proposal and definition of the relevant processes of adaptation of the model to each single organization.

Each scientific organization taking part in the project created a Genis Lab working group involving not only researchers and administrative staff, but also heads of department and junior researchers. For each organization, about ten people have been involved in the gender budgeting working group.

In 2011, the gender-participative organizational analysis was conducted by ILO. In 2012, the FGB research team met the partners, and based on the GPA discussion of the findings, elaborated and discussed the theoretical and operative methodology for the implementation of gender budgeting in the organizations.

3. Results

On the basis of the analysis of the literature[1], and of the conditions and specific requirements of the individual scientific organizations, the methodological novelties for the implementation of gender budgeting in scientific organizations have mainly regarded the processes of resource allocation and the typology of the resources considered.

In tune with the main literature on gender budgeting, gender budget implementation in scientific organizations would comprise two main steps:

Gender budget analysis, aimed at assessing, from a gender perspective, the distribution of resources in the

[1] Rothe et al. (2008), represents the main work on gender budgeting implementation in scientific organizations.

organization.

(1) Gender budget programming, aimed at changing the distribution of resources according to gender-aware criteria.

(2) Gender budgeting analysis is the first step towards gender budget programming. Adequate dissemination of the results of the gender budgeting analysis is recommended in order to increase gender awareness and to implement further gender-focused structural changes.

A certain selection of actions has to be considered common to both steps (Rothe et al., 2008). To collect and publish gender-disaggregated data is a crucial element in making transparent gender discriminations and debunking the apparent gender neutrality of the budget. However, the obtaining of disaggregated data may well represent the first serious operational challenge. Gender-disaggregated data were not available in all of the scientific organizations involved in the project. Therefore, in order to facilitate the process of introducing a system to collect gender-disaggregated data, the following steps have been defined: (1) check whether gender-disaggregated data are already collected in the organization, even if they have not yet been analyzed; (2) if data are not collected, check whether it would be possible to add gender-disaggregated information to the existing data-collection system, or to introduce a new system; (3) where necessary, update or replace data-collection systems. Moreover, responsibilities concerning the gender-disaggregated data have to be defined, and the resources must be adequate to the task.

The gender budget analysis and gender budget programming are each subdivided into several main steps, as outlined in Figure 1.

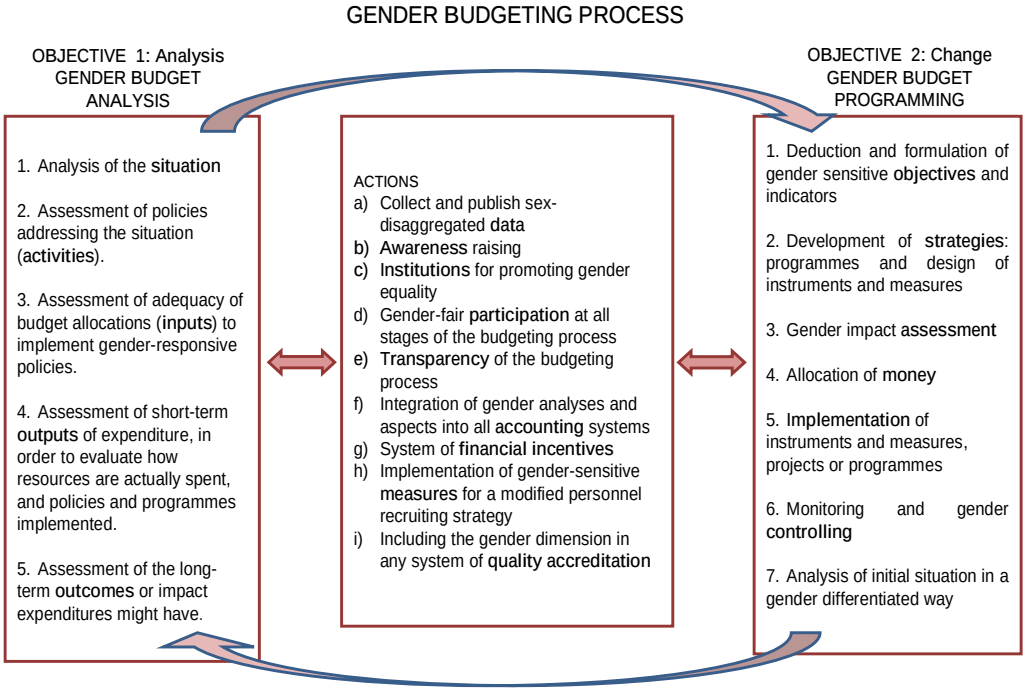

Figure 1 The Phases of Gender Budgeting

The whole process of implementing gender budgeting must be supported by actions to raise awareness of gender discrimination. Institutions specifically aimed at promoting equal opportunities should be extensively involved in the process of implementation of gender budgeting in scientific organizations. Action should be taken

to guarantee gender-fair participation and full transparency at all stages of the budgeting process. Gender analysis must be part of the whole accounting and quality-accreditation system. Other actions to be considered are a system of financial incentives and the implementation of gender-sensitive measures for a modified personnel recruiting strategy.

The first phase of gender budgeting is analysis, which first focuses on the current situation from a gender perspective, looking at gender differences in human resources, research topics, student participation, and so on. The analysis then continues with the assessment of actions, inputs, outputs and outcomes of the existing policies to tackle gender discrimination.

The second phase, based on this analysis of the organization, will define the programming dimension of the gender budgeting. Therefore, objectives, strategies, and gender impact assessment tools will be developed. They will then be implemented according to the resources allocated, and monitored and reanalyzed periodically, to determine whether adjustments are needed.

Moreover, the characteristics of the scientific organizations have rendered necessary the extension of the concept of *resource*, allowing the analysis not only of the traditional economic resources available to the organization, but also of another two resources that are fundamental in the carrying out of research — namely, time and space.

Economic resources are certainly among the most important for an organization devoted to research activity. The application of gender budgeting includes the analysis, from a gender perspective, of the allocation and management of the economic resources, distinguishing principally between public internal resources and private external ones.

Time and space are other resources of fundamental importance in the carrying out of research activity. The application of gender budgeting in scientific organizations requires, therefore, an analysis of time and space management from a gender perspective. The analysis of time management focuses not only on the distribution, between the sexes, of housework, family care and work, but also, regarding the time dedicated to work, it looks in detail at time management procedures for the various activities required for doing research. An analysis is therefore made of gender differences in the use of time devoted to research and to the other activities necessary for the smooth running of the organization.

With regard to the allocation and availability of space for conducting research, an analysis needs to be made of gender differences regarding access to the spaces in question — principally laboratories, but also the various types of space considered necessary for successful research, such as offices and studies.

Moreover, the application of gender budgeting in scientific organizations necessitates the analysis of gender differences in the entire process of allocation and management of resources. Attention must be paid, therefore, to the issue of gender in the analysis of sources of finance, allocation of funds, and the results of such allocation, as well as to the allocation of space and time.

Based on the methodology outlined in Figure 1, part of the process for implementing gender budgeting in scientific organizations has been developed. For the main three types of resources — funds, time and space — different sub-dimensions to be investigated have been outlined and for each of these a specific item to be analyzed has been defined. In order to make the process clearer, leading questions have been presented, and actions and methodology suggested, to reach the outlined output and indicators. Details are in the tables in the appendices.

4. Discussion

Gender budgeting is an umbrella term that covers various different actions to promote gender mainstreaming in the budgeting process (Elson, 2002). By framing gender issues in terms of an economic discourse, gender budgeting liberates gender (and gender mainstreaming) from the soft social issues arena, and raises it to the level of economics, which is often thought of as being technical, value-free and gender-neutral. The gender budgeting process stimulates reflection on the impact of the allocation of resources for women and for men, bringing about a gender equality perspective in the reorganization of resource allocation.

In all of the organizations taking part in the project, the issue was not the lack of a legal framework for equal-opportunity rights, but real accessibility to those rights. Gender budgeting is an innovative tool to support practical strategies and promote actions that support the structural changes required to narrow the gap between formal and substantial equality in scientific organizations. However, its implementation requires a reframing of the gender budgeting methodology in order to consider the specificity of scientific organizations.

The study presented the proposal for a theoretical and operative methodology to apply gender budgeting in scientific organizations, combining the main literature experiences and the work elaborated in the working groups within the six scientific organizations taking part in the 7th Framework Programme of the European Union Genis Lab project. The main elements in reframing the equality tool concern the analysis of the allocation of three resources: funds, time and space. Moreover the focus on gender perspective in all processes of allocation was stressed and operatively analyzed in detail (see tables in appendices).

In the context of Western economic crises, and the related cutting of resources for scientific organizations, gender budgeting implementation would require a relatively small amount of resources. Nevertheless, by contributing to the fair distribution of financial resources, it would increases the transparency of budgetary expenses, and in so doing, would ensure the maximum efficiency of the means used (Budlender & Hewitt, 2002).

The development of science in society is affected not only by economic elements. The quality of interpersonal relations, such as a respectful cultural environment and democratic spaces, plays an important role in contributing to the development of human capabilities and potentials (European Commission, 2009a). Implementing gender budgeting in scientific organizations supports the process of changing the culture of science and research, necessary to progress towards a more equal society. Gender budgeting has to be considered a crucial tool to change structures and cultures in scientific organizations. It makes clearer the need for the redefinition of criteria of excellence in science, for a more equal work-life balance, and for the development of diversity management as a crucial element for innovation (Castaño et al., 2010).

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Appendices

Table 1 A Summary of Dimensions to Consider in Gender Budgeting Implementation

Dimension	Sub-dimension	Item
Funds	Internal funds	Procedure of allocation
		Allocation criteria
		Beneficiaries
		Targeted toward equal opportunities
	External funds	Source of funds
		Access criteria
		Beneficiaries
		Topic of research
Time	Professor	Research activities
		Managerial – coordinator activities
		Fund raising
		Teaching
	Junior researcher	Research activities
		Managerial – coordinator activities
		Fund raising
		Teaching
	Non-structured junior researcher	Research activities
		Managerial – coordinator activities
		Fund raising
		Teaching
Space	Office	Professor
		Structured researcher
		Non-structured researcher
	Laboratories	Professor
		Structured researcher
		Non-structured researcher

Table 2 Gender Budgeting Methodological Proposal to Analyze Internal Funds

Gender budgeting item	Leading questions	Actions	Methodology	Indicators	Output
Funds allocation procedure.	What is the funds allocation formal procedure? Who is responsible for allocation of funds?	Data collection.	Desk analysis. Interviews with stakeholders.	Complete information on procedure of fund allocation and related responsibilities.	Diagram and organization chart of fund allocation procedure.
Gender balance in the process of funds allocation.	Does the organization have gender-disaggregated data on people involved in fund allocation procedure? How many women and men are involved in the fund allocation process, and with what responsibilities?	If yes, collect data already available. If not, introduce the procedure to collect gender-disaggregated data on this item.	Desk analysis.	Total number of women involved in fund allocation procedure / Total number of people involved in fund allocation procedure. No. of women / total no. of people according to responsibilities they have.	Gender-disaggregated data concerning fund allocation procedure.
Fund allocation criteria.	What are the criteria in fund allocation?	Data collection.	Desk analysis. Interview with stakeholders.	Number and typologies (objective, subjective) of criteria in fund allocation.	List of criteria for allocation of funds.
	Do fund allocation criteria consider the gender dimension? If so, how is gender considered in the fund allocation criteria?	Data collection.	Desk analysis. Interview with stakeholders.	Gender is explicitly considered: yes/no.	Data on gender consideration in funds allocation criteria.
Fund Beneficiaries.	Does the organization have gender-disaggregated data on beneficiaries of funds?	If so, collect data already available. If not, introduce the procedure to collect gender-disaggregated data on this item.	Desk analysis. Interview with stakeholders.	Gender-disaggregated data on fund beneficiaries: yes/no. Number of female beneficiaries/total number of beneficiaries	Gender disaggregated data on funds beneficiaries.
Gender equality funds.	Are there funds specifically targeted to gender equality policies? What is the amount of the gender equality targeted funds? What or who decides the amount of the gender equality targeted funds? What are the main gender equality activities funded? Is there a system to evaluate their efficacy and efficiency?	Data collection.	Desk analysis. Interview with stakeholders.	Funds specifically targeted to gender equality: yes/no. Gender equality targeted funds/total of internal funds.	Data on gender equality targeted funds and related activities.

Table 3 Gender Budgeting Methodological Proposal to Analyze External Funds

Gender budgeting item	Leading questions	Actions	Methodology	Indicators	Output
Gender focus in externally funding researches organizations.	Does the organization collect data on the sources of external funds? Are there external funds coming from organizations specifically working on gender equality ? What organizations are? How many of the external organizations are gender-oriented? How much do these organizations contribute in external research funds for the organization?	If so, collect data already available. If not, introduce the procedure to collect data on this item.	Desk analysis. Interview with stakeholders.	Yes /no. List of gender-oriented organizations. No. of external organizations funding the research project with a specific attention on gender equality / total no. of external organizations. External gender-oriented organizations funds / total external funds.	Map and analysis of organizations externally funding research.
Coordinator of externally funded researches.	How many externally funded researches are coordinated by women? Are there women coordinating externally funded research projects funded by organizations with specific focus on gender?	If yes, collect data already available. If not, introduce the procedure to collect data on this item.	Desk analysis. Interview with stakeholders	1. No. of women coordinating research with external funds/ total no. of researches funded by external funds. 2. No. of women coordinating research projects funded by organizations specifically focused on gender equality.	Map of gender coordinators of research projects.
Research team working on externally funded researches.	What is the gender composition of research team working on externally funded researches? What are the role of women and men in the research team?	Data collection.	Desk analysis. Interview with stakeholders.	For externally funded researches, no. of women in the research team / no. of men.	Gender analysis of externally funded researches team.
Topic of externally funded researches.	Do externally funded researches have a specific focus on gender?	Data collection.	Desk analysis. Interview with stakeholders.	No. of externally funded researches with specific focus on gender/ total no. of externally funded researches.	Gender analysis of externally funded researches.

Table 4 Gender Budgeting: Methodological Proposal to Analyze Allocation of Time and Space in Scientific Organizations

Gender budgeting item	Leading questions	Actions	Methodology	Indicators	Output
Gender differences in time managing.	Does the organization collect data on gender differences in time managing? Are there gender differences in time managing for people in the same position?	If yes, collect data already available. If not, introduce the procedure to collect data on this item (Daily diary)[2].	Desk analysis. Interview with stakeholders. Participatory observation. Analysis of filled daily diaries.	Data on gender differences in time managing: yes/no. Introduction of data collection on gender differences in time managing: yes/no. No. of diaries filled/ no. of diaries distributed.	Data on gender differences in time managing. Daily diary.
Gender differences in space allocation.	Does the organization collect data on gender differences in space – office allocation? Are there gender differences in office allocation according to the role in the organization?	If yes, collect data already available. If not, introduce the procedure to collect data on this item. Analysis of data.	Desk analysis. Interview with stakeholders. Participatory observation.	Dimension and quality of office according to gender.	Map of office allocation according to gender.
Access to laboratories for researchers.	Does the organization collect gender-disaggregated data regarding access to laboratories? Are there gender differences in access to laboratories for senior researchers?	If yes, collect data already available. If not, introduce the procedure to collect data on this item (form to fill in).	Desk analysis. Interview with stakeholders. Participatory observation. Analysis of form filled.	No. of forms filled/ no. of forms distributed.	Data of gender differences in accessing laboratories for senior/junior researchers.

[2] Daily diary for Ph.D. students might include bibliographical research, field research, publication of papers, fund-raising activities, preparing materials for laboratories, cleaning, and so on.