



## Developing a methodology to assess the impact of research grant funding: A mixed methods approach



Carter Bloch<sup>\*</sup>, Mads P. Sørensen, Ebbe K. Graversen, Jesper W. Schneider, Evanthia Kalpazidou Schmidt, Kaare Aagaard, Niels Mejlgard

Danish Centre for Studies in Research and Research Policy, Department of Political Science and Government, Aarhus University, Bartholins Allé 7, DK-8000 Aarhus C, Denmark

### ARTICLE INFO

#### Article history:

Received 7 March 2013  
Received in revised form 14 October 2013  
Accepted 19 December 2013

#### Keywords:

Mixed methods  
Research policy  
Grants  
Additionality  
Impact analysis

### ABSTRACT

This paper discusses the development of a mixed methods approach to analyse research funding. Research policy has taken on an increasingly prominent role in the broader political scene, where research is seen as a critical factor in maintaining and improving growth, welfare and international competitiveness. This has motivated growing emphasis on the impacts of science funding, and how funding can best be designed to promote socio-economic progress. Meeting these demands for impact assessment involves a number of complex issues that are difficult to fully address in a single study or in the design of a single methodology. However, they point to some general principles that can be explored in methodological design. We draw on a recent evaluation of the impacts of research grant funding, discussing both key issues in developing a methodology for the analysis and subsequent results. The case of research grant funding, involving a complex mix of direct and intermediate effects that contribute to the overall impact of funding on research performance, illustrates the value of a mixed methods approach to provide a more robust and complete analysis of policy impacts. Reflections on the strengths and weaknesses of the methodology are used to examine refinements for future work.

© 2014 Elsevier Ltd. All rights reserved.

### 1. Introduction

Research policy has taken on an increasingly prominent role in the broader political scene. The driving force behind this change is the belief that research is a critical factor in maintaining and improving growth, welfare and international competitiveness. This increased focus on the promotion of research<sup>1</sup> has not just led to a greater allocation of resources to the area; it has also led to a rethinking of the ways in which research can benefit the economy and society.

In terms of goals, there is an increasing emphasis on the impacts of science funding, and how funding can best be designed to promote economic and social progress (OECD, 2010). Examples here are questions of how to fund research in order to better encourage scientific breakthroughs (National Research Council, 2012), supporting the development of new areas that emerge at the boundaries of existing disciplines (European Commission, 2005), and how funding programmes can take into account the

way that the overall science and innovation system functions and evolves in spreading and developing new knowledge (Feller, 2007). Feller (2007) points out that many of these are ex ante questions that are more focused on informing future decisions as opposed to an ex post assessment of what worked and what did not.<sup>2</sup> In terms of measurement, there is an increasing demand for improved quantitative evidence on the impacts of research funding and to establish the causal relations between funded projects and results (Lane, 2009; Lane & Bertuzzi, 2011; Salter & Martin, 2001). Governments face a number of competing demands for public funding, pushing efforts to seek more efficient allocation of resources. At the same time, econometric analyses face a number of challenges in providing the information that is needed (Jaffe, 2002; Macilwain, 2010; Salter & Martin, 2001). In particular, data limitations may necessitate assumptions that are not fully realistic or restrict analyses to specific issues that do not provide the full picture (Feller, 2007).

Meeting these demands for impact assessment is a tall order and one that involves a number of complex issues that are difficult to fully address in a single study or in the design of a single methodology. However, they point to some general principles that

<sup>\*</sup> Corresponding author. Tel.: +45 87165901.

E-mail address: [carter.bloch@cfa.au.dk](mailto:carter.bloch@cfa.au.dk) (C. Bloch).

<sup>1</sup> See for example, the America COMPETES act (U.S. Department of Commerce, 2012) and the EU 2020 initiative (EU Commission, 2011).

<sup>2</sup> See also Georghiou and Roessner (2000).

can be explored in methodological design and have also been used to guide the study examined in this paper. First, studies of research funding should be forward looking and explorative, analysing how results can inform future measures and thus measuring both intended and unintended outcomes. Second, given a focus on informing future use, the questions of why and how the impacts were achieved are as equally important as the question of what the impact itself was. Third, a systems view is important towards understanding funding impacts and putting them into a broader context.

This paper discusses the development of a mixed methods approach to analyse research funding. We outline and critically assess an approach recently developed for a study of the effects of research grants for the Danish Council for Independent Research over the period 2001–2008. In all, approximately 2600 small to medium sized grants to a total of around \$600 million<sup>3</sup> were awarded to 1600 different principle investigators covering all main fields of science.<sup>4</sup>

The main objective of the study was to gain a comprehensive view of the impacts of research project grants for research output, the researchers themselves and their related research environments. In addition, the study examined the role of the application process and how it may have an important influence on the impact of the funding programme, both through grant recipients and those that have been declined. Key focus areas for the study were the role of grant size, the influence of grants on risk-taking behaviour within research, and characterizing differences across research fields.

Our design of research method is driven by a desire to capture the full impact of research funding grants, by data availability and by the limitations of feasible quantitative approaches based on existing sources of objective data; all of which argue for a mixed methods approach employing both quantitative and qualitative analyses. A survey-based approach is needed to capture a number of effects that are not possible to examine based on quantitative analysis of existing data sources. Combining the survey approach with studies based on bibliometric data and register-based data on careers provides hard objective evidence on the impacts of funding grants, which is crucial both for understanding the actual effects of the grants and for their justification. Finally, in order to better understand how these effects take place, in depth qualitative analysis is also needed. Qualitative interviews both provide illustrative examples that greatly strengthen the quantitative results, and allow us to examine in depth issues or elaborate on the results raised in the other analyses. A key focus in the paper is in how the different types of analyses can be used to complement and validate their respective results, thereby improving the robustness of the measures. An additional focus is on the need for both quantitative and qualitative analyses in order to provide a better understanding of not just what the impacts are, but how and why they occur.

The study of research grants provides a detailed illustration of the strengths of our implemented mixed methods approach. However, it is equally useful in identifying limitations due to data, timing and method. Hence, the paper will critically examine our approach and discuss how it could be strengthened.

The remainder of the paper is organized as follows. The next section contains a brief overview of the mixed methods literature used to frame our study design. The subsequent section outlines the mixed methods design that was developed and implemented

in the study of research project grants. Thereafter, results of the study are presented in order to illustrate the strengths and limitations of the mixed methods approach used. This section is followed by a critical assessment of the approach and implications for future design. The final section concludes.

## 2. Mixed methods research – an overview

Mixed methods research can be defined as “the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language in a single study” (Johnson & Onwuegbuzie, 2004, p. 17). Mixed methods research represents a pragmatic combination of methodological approaches and their underlying rationales. This combination however raises epistemological issues which some view as implying that qualitative and quantitative approaches are incompatible (Howe, 1988; Lincoln, 1990). Quantitative approaches are typically linked to positivistic views that social phenomena can be analysed objectively in much the same way as physical phenomena, by making context-free generalizations that can be tested. Qualitative approaches are typically based on an interpretivistic view that social phenomena must be seen from the point of view of the subject, that behaviour can only be understood in the context of meaning systems employed by a particular group or society.

Mixed methods takes a pragmatic stance between these “purist approaches” (Johnson & Onwuegbuzie, 2004), for example that while context is important, some degree of generalization is also possible. Furthermore, qualitative and quantitative methods often cannot be directly linked to a specific epistemological stance. For example, surveys are not necessarily based on positivistic assumptions (Brannen, 2005) and qualitative approaches may often make ‘quasi-generalizations’ (Bryman, 1984). The value of mixed methods is seen in its ability to address problems from a number of angles to provide a more comprehensive analysis. “Audiences such as policy makers, practitioners, and others in applied areas need multiple forms of evidence to document and inform the research problems. A call for increased sophistication of evidence leads to a collection of both quantitative and qualitative data” (Creswell, 2006, p. 13).

Mark, Henry, and Julnes (1999) argue that an integrative framework that takes into account both types of inquiry and evaluation purposes creates a common ground that can accommodate both qualitative and quantitative paradigms. They identify four types of purposes, each of which to a certain degree influences choice of approach: assessment of merit and worth, oversight and compliance, programme and organizational improvement, and knowledge development.

The use of a combination of quantitative and qualitative approaches, mixed methods research, has increased considerably over the last couple of decades (Creswell, 2006; Teddlie & Tashakkori, 2009). The field of mixed methods research accordingly has moved beyond quantitative versus qualitative arguments and recognizes the value of both paradigms in order to maximize the strengths and minimize the weaknesses of each other (Johnson & Onwuegbuzie, 2004; Maxcy, 2003; Morgan, 2007).

Despite its value “there are many unresolved issues to address before a more matured mixed methods research area can emerge” (Teddlie & Tashakkori, 2003, p. 3). Conducting mixed methods research implies challenges to method design, such as whether both the methods are given equal priority, whether to conduct the qualitative and quantitative stages concurrently or sequentially, where the mixing of the methods will occur, and how the methods interact. Furthermore, in order to mix approaches in an effective way, researchers need to have a profound knowledge of both the quantitative and qualitative methodologies and consider all

<sup>3</sup> For simplicity, throughout the paper we use an approximate exchange rate 1 USD = 6 DKK.

<sup>4</sup> The Research Council consists of five individual councils responsible for awarding funding within their field: Natural Sciences, Medical Sciences, Technology and Production Sciences, Social Sciences and Humanities.

Download English Version:

<https://daneshyari.com/en/article/322496>

Download Persian Version:

<https://daneshyari.com/article/322496>

[Daneshyari.com](https://daneshyari.com)