Quasi-experimental methods for policy evaluation

RESEARCH PROGRAM

Objectives

The activities for this project are functional to the Joint Funding Action PEN (Effectiveness of existing policies for lifestyle interventions Policy Evaluation Network), funded by the Ministry of Higher Education and Research (MIUR) within the framework of the Joint Programming Initiative A Healthy Diet for a Healthy Life (HDHL). The successful candidate will contribute to the review and implementation of quasi-experimental econometric methods for the ex-post evaluation of policy impacts based on non-experimental data.

Project Background

The Policy Evaluation Network PEN, scheduled to start on 1 February 2019, is a joint action aimed at establishing a multi-disciplinary European research network for the monitoring, benchmarking and evaluation of policies that affect lifestyles with a standardized approach across Europe. PEN is a multi-disciplinary consortium of scientists from 28 research centres, supported by joint programming grants from Germany, Ireland, Italy, The Netherlands, Norway, Poland and France, plus a non-EC team from New Zealand. To address the major societal challenges and enhance cooperation in research across Europe, the European Commission has initiated and facilitated joint programming. This joint programming is a process by which Member States engage in defining, developing and implementing a common strategic research agenda, based on a shared vision of how to address major societal challenges that no Member State is capable of resolving independently.

PENs vision is to provide Europe with tools to identify, evaluate and benchmark policies designed to directly or indirectly address physical inactivity, unhealthy diets and sedentary behaviour while accounting for existing health inequities. Using structured evaluation principles and methods, PEN will examine the content, implementation and impact of lifestyle policies across Europe and will build on existing knowledge from DEDIPAC (Determinants of Diet and Physical Activity) and the INFORMAS (International Network...
for Food and Obesity/ non-communicable diseases Research, Monitoring and Action Support) framework.

Description of work

Within the PEN project, the unit of the Department of Statistical Sciences of the University of Bologna (UNIBO) will act as the Italian national co-ordinator within a consortium that also involves researchers from the Catholic University of Piacenza. The UNIBO team will:

- Co-ordinate Workpackage 3 on the Estimation and simulation of policy impact, a methodological workpackage aimed at review, critically assess and refine quantitative methods for the evaluation of the impact of public policies targeting diet, PA and/ or SB across Europe. The planned activities provide methodological support for and contribute to the policy evaluation of existing case studies. The guiding frameworks employed in this WP are mostly statistical in nature, as they are specific to causal inference, health economics/econometrics and epidemiology/ public health.

- Lead Task 3.1 on Experimental and quasi-experimental methods to estimate policy impacts. The focus of this task is on methods for the quantification of policy impacts in terms of efficacy and effectiveness. The task will aim at: (a) proposing a framework for judgments about the quality and robustness of the evidence for each assessed outcome, so that the evidence basis can feed into decision support tools; (b) identifying the strengths, weaknesses and the main conditions required for a rigorous ex-ante evaluation of policy impacts through lab-field-natural experiments, especially in relation to capturing behavioural phenomena; and (c) reviewing the applicability and limitations of quasi-experimental econometric methods for the ex-post evaluation of policy impacts based on observational data not collected for evaluation purposes. The identification of causal effects in this WP can generally be described by the Potential Outcomes Framework (Rubin, 2005).

- Lead Sub-task 3.1.3 on Quasi-experimental methods for ex-post evaluations on observational data. This task covers ex-post evaluations based on observational data, that are not collected through randomised designs or that may be affected by selection bias (e.g. self-selections). In these cases, causal inference may be problematic, and
the identification of causal pathways can be addressed by techniques such as difference-in-difference, regression discontinuity designs, instrumental variables, propensity score matching, interrupted-time series, Bayesian synthetic control methods and counterfactual scenario analyses. This sub-task explores the applicability of these methods to the ex-post evaluation of public policies, considering the ideal data conditions and examples/applications based on case studies.

- Lead Sub-task 6.1.4 on the Ex-post evaluation of existing sugar-sweetened beverages (SSB) tax with home scan data. The availability of highly detailed transaction data collected through the home scan technology by commercial research companies (e.g. Kantar Worldpanel; GfK Europanel; Nielsen Consumer Panel) provides a unique opportunity for the timely evaluation of nutrition policies, but it also poses some major data management and methodological challenges, due to the amount of information available (usually at the individual transaction level). This task will identify a sugar or SSB tax (potential candidates being the UK sugar tax from April 2018, the Estonian sugar tax from January 2018, the tax on SSBs introduced in Belgium in 2016) to provide an evaluation of its effectiveness in terms of nutritional quality of purchases, substitution patterns and distribution of the impact across different socio-economic and vulnerable groups.

- Contribute to Task 3.2 on The economic dimension of policy impacts. Rigorous policy evaluation and the identification of policy impacts on outcome measures require consideration of the direct effects on health and the healthcare system, indirect effects of policies in other sectors, and the broader economic environment. This task provides the tools and background elements to account for such economic dimensions, in relation to the case studies envisaged in the project. Two main economic dimensions are considered: (a) the direct impact of policies on health-economic dimensions, such as the change in life expectancy (accounting for the quality of life), and long-term health care costs that result from changes in risk levels and distributions; and (b) the indirect interaction of policies with the broader economic environment, including other large-scale policies that are likely to act on the same outcomes (e.g. agricultural policies, transport policies, other health policies). The role of income distribution in determining the policy outcome and the effect of nutrition, PA and SB policies in terms
of their potential regressive (i.e. placing a higher burden or generating a lower impact on low-income groups) or progressive effects must be considered in both economic dimensions.

The PEN project lasts for three years, starting on 1 February 2019 until 31 January 2022. The grant will be initially for one year, but may be renewed.

The successful candidate will be part of the research team of the University of Bologna involving members of the Department of Statistical Sciences and contribute to the activities planned for the first year, more specifically those listed under Sub-task 3.1.3, and to the preparation of data for Sub-task 6.1.4.

The successful candidate is expected to:

- Review methodological aspects of quasi-experimental evaluation methods:
  - Difference-in-difference
  - Instrumental variables
  - Propensity score matching
  - Regression discontinuity design
- Explore/write STATA routines for PEN applied evaluation tasks
- Contribute to the pre-processing of the Home Scan data for the activities planned under Sub-Task 6.1.4:
  - Review the methodological literature on estimation of consumer model based on disaggregated scan data, especially on issues related to zero observations and corner solutions, and on biases associated with the use of unit values;
  - Provide Initial exploration / literature review on the comparison between aggregate demand systems (AIDS, EASI) and discrete choice models (this task will be developed into an applied comparison in case of renewal after the first year)
- Participate to the PEN project meetings
- Contribute to the project administration
GRANT OBJECTIVES, TRAINING AND RESEARCH PLAN

The grant is for 12 months, starting on 1 December 2018 and may be renewed after the first year.

Requisites for candidates

The successful candidate should:

a Master oral and written English language
b Have previous experience in international research projects
c Have a solid statistical training, possibly with experience on the application to food economics/food consumption issues
d Have a good knowledge of statistical software and coding, preferably Stata and/or R
e Have a good knowledge of LaTex language for writing scientific reports and articles

Grant objectives

The specific objective of the training programme is to acquire skills on methods for the ex-post evaluation of policies and programs using observational / non-experimental data.

Training

The successful candidate will be trained in the following activities:

a Learn the foundations of quasi-experimental evaluation methods
b Manage and pre-process large home-scan data-set for subsequent statistical analysis
c Run statistical analyses using Stata, including writing ad-hoc commands
d Write scientific reports and papers

Training will include:
1. Supervision and guidance by members of the UNIBO research team

2. Attendance of short courses on quantitative methods relevant to the project objectives, for example trainings and workshop organized by CEMMAP in London, and/or IRVAPP schools on policy evaluation methods

3. The opportunity to spend study/research periods at PEN training institutions and other institutions with a focus on policy evaluation

Expected outputs
At the end of the first year, the grant holder should have produced at least one working paper ready for submission on a topic relevant to the project.

Timeline of the research plan
- **Months 1-3**: review of the relevant literature, initial training on methods / Stata coding, contribute to the identification of the case study and to the tender for purchasing home scan data
- **Months 4-6**: acquisition and pre-processing of the data-set
- **Months 7-9**: pilot analyses
- **Months 10-12**: report and working papers writing
Bibliography


