



# Evaluating the effectiveness of an environmental disclosure policy: An application to New South Wales<sup>☆</sup>



M. Taha Kasim

Department of Economics, Furman University, 3300 Poinsett Hwy., Greenville, SC 29613, USA

## ARTICLE INFO

### Article history:

Received 9 April 2015

Received in revised form 26 August 2016

Accepted 11 April 2017

Available online 20 April 2017

### Keywords:

Environmental information disclosure

Air pollution

Discontinuity-based OLS

New South Wales

### JEL classification:

codes: L51

Q53

Q58

## ABSTRACT

The main purpose of introducing an environmental information disclosure strategy is to reduce informational asymmetries and put pressure on firms to reduce emissions. This paper studies the impact of such a policy on air quality in New South Wales (NSW), Australia. A regression discontinuity design is employed and the results show that pollutant concentration levels were not significantly affected after the implementation of the policy. Empirically, the estimates of the effects under the discontinuity-based OLS model have the opposite sign for some of the pollutants relative to the estimates from the basic OLS model. Therefore, basing conclusions on the OLS results will engender incorrect inference. Discontinuity-based results are robust to different model specifications.

© 2017 Elsevier B.V. All rights reserved.

## 1. Introduction

Policy-makers have introduced a variety of instruments (environmental standards, emissions taxes, emissions permits markets) to curb industrial air emissions.<sup>1</sup> One such policy is the disclosure of environmental information. The main purpose of introducing environmental information disclosure policies is to reduce informational asymmetries and put, if necessary, pressure on firms to reduce emissions. Perhaps the most well-known example of such a strategy is the Toxic Release Inventory (TRI), first employed in the US in 1985 and later incorporated into the Pollution Prevention Act of 1990.<sup>2</sup> Other countries and regions have followed the US in this regard and have made disclosure of environmental information part of their laws. It became part of the European Union Constitution in 2002 when the Aarhus Convention was ratified in Denmark to incorporate

<sup>☆</sup> I would like to thank H. Spencer Banzhaf, Charles Courtemanche, Shanjun Li, Kyle Mangum, Michael K. Price and two anonymous referees for their valuable comments and suggestions. Any opinions, conclusions or errors expressed herein are those of the author.

E-mail address: [mohammed.taha@furman.edu](mailto:mohammed.taha@furman.edu)

<sup>1</sup> For more on these and others see Sterner (2002), Goulder and Parry (2008) and Banzhaf (2012).

<sup>2</sup> TRI was introduced after considering the negative impacts due to the toxic releases in the 1984 Bhopal disaster. Under the TRI, 18,500 companies reported 10.4 billion pounds of toxic chemicals released in 1987. In 2005, 23,461 companies reported 4.34 billion pounds of chemicals released in the air; a decline of 54%. However, the rate of reduction in emissions has declined relative to the initial years when the program started. Between 1988 and 1993 there was a reduction in toxic releases by 37%, whereas toxic releases declined by only 10% between 1993 and 1998. Studies evaluating the effectiveness of TRI as a policy tool have produced mixed results (see Bui and Mayer (2003) and Oberholzer-Gee and Mitsunari (2006)).

the new strategy.<sup>3</sup> The British Companies Act of 2006 requires companies listed on the London Stock Exchange to report in their annual Business Review the impact they have on the environment. In 2008, Buenos Aires City Council passed Law # 2598 requiring all firms that employ more than three-hundred workers to create annual sustainability reports that should be available to the public.<sup>4</sup> Several stock exchange markets (Johannesburg Stock Exchange (JSE), Bursa Malaysia, Bovespa and the Tel Aviv Stock Exchange) have also introduced measures to enhance environmental information disclosure.<sup>5</sup> These measures have been implanted to increase corporate social responsibilities, with respect to the environment in particular. This paper studies the impact on air pollution of an environmental disclosure policy that was recently implemented in New South Wales (NSW), Australia. Starting from July 1<sup>st</sup>, 2012 firms holding an Environmental Protection License (EPL) in NSW are required to provide public access to emissions monitoring data recorded under each EPL that they hold. This is part of NSW's Protection of the Environment Legislation Amendment Act of 2011. To analyze the influence of this new policy, this paper focuses on the two largest cities in NSW: Sydney and Newcastle.

Previous studies have shown the effects of environmental information disclosure policies on various outcomes that are indirectly related to environmental quality (financial performance, environmental injustice, investor behavior, political activism, distribution of housing prices).<sup>6</sup> [Perlin et al. \(1995\)](#) study how effective TRI has been in reducing environmental injustice. Their results show that TRI has *not* been influential in terms of affecting the distribution of environmental justice in the US. In 1990, besides Native Americans, minority groups continued to inhabit more polluted regions relative to whites. [Bui and Mayer \(2003\)](#) find that TRI has no impact on political activism or the distribution of housing prices and advocates for the traditional command-and-control policies. [Bui \(2005\)](#) report that the effects of TRI in reducing emissions are overstated and it could be that the policy has merely led to a substitution to other chemicals that are not necessarily less toxic. [Foulon et al. \(2002\)](#) examines the impacts of traditional policies (fines and penalties) and information disclosure strategies on firm behavior. They studied fifteen plants in the pulp and paper industry between 1987 and 1996 in British Columbia, Canada. They find that information disclosure provided additional and stronger incentives for firms to reduce pollution. However, very little work has been done with regards to the effects of such policies on environmental quality.

The main purpose of this paper is to estimate the impact of an environmental disclosure policy on air pollution. The identification assumption of the study is that there should be a discontinuity in the pollution measure on the date the environmental information disclosure policy is enforced. This assumption implies that in the absence of the policy, air pollution would have changed continuously on the implementation date. To exploit the exogenous shock produced by the policy, a regression discontinuity design is employed. The benefit of such an approach is that the coefficients can be interpreted causally. A requirement for such a methodology, however, is availability of high-frequency data. Fortunately, such data is reported before and after the policy implementation date for NSW.

Air pollution created by industrial activities could be in the form of gases (nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), carbon monoxide (CO)) or solid particles (particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>)). Interactions of these pollutants could create additional pollutants. For example, ground level ozone (O<sub>3</sub>) is produced when NO<sub>x</sub>, CO and volatile organic compounds (VOCs) react in the presence of sunlight and heat. Air pollution is a major concern today, particularly in urban centers. Inhaling unclean air mainly affects the body's respiratory and the cardiovascular systems and these effects are more prominent among children. Effects of air quality on health and productivity have been documented in numerous studies ([Chay and Greenstone \(2003\)](#) and [Currie et al. \(2014\)](#)).<sup>7</sup> Furthermore, air pollution also damages ecological resources (water and soil quality, plants and animals).<sup>8</sup> The total social costs of air pollution are possibly quite large when one also accounts for household behavioral adjustments to minimize exposure to pollution.<sup>9</sup>

[Fig. 1A and B](#) plot the average daily pollutant levels for Sydney and Newcastle respectively, for the years 2011–2013. Pollutants shown in [Fig. 1](#) are: NO<sub>x</sub>, CO, PM<sub>10</sub>, PM<sub>2.5</sub> and O<sub>3</sub>. The broken line indicates the date (July 1<sup>st</sup>, 2012) when the policy required firms to report emissions. No distinguishable pattern can be ascertained by looking at the distribution of these pollutants. Moreover, using ocular methods, a break in air pollutant levels on July 1<sup>st</sup>, 2012 is hard to detect. Similarly, the discontinuity based results indicate that the information disclosure policy had negligible effects on the pollutant

<sup>3</sup> Under Article 2(2)d of the Aarhus Convention, the public (individuals and associations) has the right to environmental information. Public authorities are obliged to provide environmental information that is in their possession. Access to environmental information follows from the first EU Directive on the Freedom of Access to Information on the Environment, the ECE Guidelines on Access to Environmental Information and the Public Participation in Environmental Decision Making of 1995 and the Rio Declaration of 1992.

<sup>4</sup> Firms in Buenos Aires have to comply with the Ethos Principle at the minimum but are encouraged to use Global Reporting Initiative's G3 guidelines when making their reports. For more on this see [The International Corporate Sustainability Reporting Site](#).

<sup>5</sup> Since 2005, Bovespa has been creating a Corporate Sustainability Index in which company stocks are ranked according to sustainability and social responsibility. Similarly, in 2004, JSE started producing socially responsible investment (SRI) indices. In the US, the Securities and Exchange Commission sometimes requires disclosure of hazardous waste materials. For more on these see [Lydenberg and Grace \(2008\)](#).

<sup>6</sup> [Hamilton \(1995\)](#) shows that TRI did affect the behavior of investors and third parties (journalists in their study). Firms that reported higher pollutant emissions, land releases, underground injections, and waste shipped off-site or chemical submissions were more likely to be covered by journalists. Companies that reported information prior to the introduction of TRI program were least likely to receive coverage from journalists.

<sup>7</sup> [Chay and Greenstone \(2003\)](#) exploit the variation produced by the 1982–84 recession to show a positive causal relationship between exposure to particulate matter and infant mortality. [Currie et al. \(2014\)](#) summarize literature on how exposure to pollution during childhood affects adult outcomes.

<sup>8</sup> For a rigorous study on the effects of air pollution on vegetation and other environmental resources see, [Banzhaf et al. \(2006\)](#) and [Stern \(1977\)](#).

<sup>9</sup> [Mu and Zhang \(2014\)](#) report increases in investments in face-masks as air pollution intensifies in China. Defensive investments could also include sorting into neighborhoods with cleaner air ([Banzhaf and Walsh, 2008](#)) or expenditures on medicines ([Deschenes et al., 2012](#)).

Download English Version:

<https://daneshyari.com/en/article/5104087>

Download Persian Version:

<https://daneshyari.com/article/5104087>

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