



The causal effects of regional industrial policies on employment: A synthetic control approach



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ARTICLE INFO

JEL:

C81
E24
H40
J48
O25
R58

Keywords:

Regional industrial policy
Employment
Synthetic control method
Policy evaluation
Tourism

ABSTRACT

Industrial policies affecting entire sectors in regions, provinces, or districts can account for large portions of sub-national government spending. Yet because of the methodological challenges related to the identification of a counterfactual when a single unit is treated, the causal effects of these policies on the growth of the industry, or specifically on employment, are seldom identified. We adopt a Synthetic Control Method (SCM) approach to analyze the long-term impact on employment of the Tourism Development Policy (TDP) implemented by the Argentinean province of Salta. We find an 11 percent average annual impact over 10 years on employment in the hospitality sector, which translated in an accumulated impact of 1376 formal jobs in the tourism value-chain. We also find that this growth did not happen at the expenses of other industries and that TDP generated positive inter-industry employment spillovers/externalities. For each job created in the tourism value-chain, an additional job was created in the rest of the provincial economy, which resulted in a total creation of 2750 formal jobs. Our results are robust across a series of placebo tests and sensitivity checks and are consistent among alternative synthetic control units.

1. Introduction

In the last decades, industrial policy has been absent from the economic policy debate. Memories of failed import substitution policies, with disappointing consequences for public finance, kept policy-makers from even contemplating industrial policy as a viable option. However, since the global crisis of 2008–2009, interest in industrial policy has re-emerged in developed and developing economies alike, particularly at the sub-national level. Given the outstanding results achieved by the early Asian Tigers of South Korea and Taiwan, industrial policies have not only been reconsidered, but even advocated by scholars such as Philippe Aghion, Ricardo Hausmann, Dani Rodrik, and Joseph Stiglitz (Aghion et al., 2011; Hausmann and Rodrik, 2006; Rodrik, 2004; Stiglitz et al., 2013). And when, in 2010, the free-market champion and former EU Commissioner for Competition Policy Mario

Monti stated that “Industrial policy is no longer taboo”,¹ it was clear that policy-makers had altered their perspective as well. Industrial policy was back on the public policy agenda.²

Policies focused on local production systems, industrial districts, networks, clusters, and regional innovation systems, with a strong emphasis on improving regional competitive advantage, have emerged as a new style of policy-making. Due to dramatic job losses after the crisis of 2008–2009, the United States and Europe introduced measures to support strategic industries (Kline and Moretti, 2013).³ An increasing number of developing countries, particularly in Latin America, have also introduced strategic development plans targeting specific industries in certain regions,⁴ and programs to support industry clusters and value chains focusing on specific local industries (Crespi et al., 2014; Maffioli et al., 2016).

Like other large-scale economic policies, industrial policies are

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¹ See “The Global Revival of Industrial Policy: Picking Winner, Saving Losers.” *The Economist* (Aug 5, 2010).

² For the purpose of this study, “industrial policy” is a policy that directs public investments to specific industries in a given economy.

³ For instance, the U.S. government and many individual state governments have spent roughly \$95 billion a year on regional development policies targeting specific industries (Kline and Moretti, 2013).

⁴ See, for example, the Sector Funds Program in Brazil, the experience of CORFO and SERCOTEC in Chile, and the initiatives introduced in Mexico by the CONACYT and in Argentina by the MINCYT.

often implemented at the regional or provincial level and determine how significant portions of federal and/or sub-national government budgets are allocated. This is because policy-makers view regional industrial policies (RIPs) as important instruments to boost job creation and productivity-based growth.

In terms of job creation, three questions are particularly relevant in the context of RIPs: (i) What is the causal effect of RIPs on employment of the target region-industry?; (ii) Does the increase in employment in the target region-industry due to the RIPs come at the expenses of other industries or as an increase of total (regional) employment?; and, (iii) Does the RIP generate positive inter-industry employment spillovers/externalities i.e. the increase in total employment is larger than the increase in the employment in the target region-industry? To date, however, little empirical evidence has been produced to answer these questions, and few studies have properly dealt with the methodological challenges related to the identification of the causal effects of RIPs.

Three issues make the evaluation of RIPs particularly challenging. First, RIPs are usually implemented at the aggregate level, affecting a single industry within a region, province, or district. This implies that all individuals or firms that belong to or are related to the treated industry within the government's zone of influence are in some way affected by the intervention. Second, RIPs often target high-growth-potential industries, which are also commonly characterized by externalities and agglomeration economies, making indirect effects an important issue to be considered when estimating a proper counterfactual (Angelucci and di Maro, 2016). Finally, RIPs usually comprise a bundle of policy instruments, including business support, tax incentives, infrastructure development, and institutional strengthening. These intrinsic characteristics of the RIP often leave the researcher with only one (aggregate) treated unit. In this context, pure time series or before-after analysis of the impacts would be clearly contaminated by changes other than those induced by the RIPs.

To answer the aforementioned questions and address the empirical challenges, this paper proposes the application of the synthetic control method (SCM) approach to identify the causal effects of a RIP. As a case study, we examine the Tourism Development Policy (TDP) implemented in the Argentinean province of Salta. The SCM, developed by Abadie and Gardeazabal (2003) and extended in Abadie et al. (2010), is an econometric technique used to devise data-driven comparative case studies. Specifically, we use a combination of other Argentinean provinces to construct a “synthetic” control that resembles Salta's tourism industry before the TDP and produces a counterfactual of what would happened in the absence of the TDP.

The TDP case is a relevant for two reasons. First, the government of Salta designed the TDP to boost job creation in the province. Second, the TDP followed an integrated, large-scale approach to tourism development that included upgrading tourism and transport infrastructure, restoring cultural heritage, strengthening institutions, and launching national and international promotional campaigns. The plan required public-private partnerships and a long-term commitment by the provincial government.

For our analysis we use data from 1996 to 2013 consisting of monthly information on different economic sectors at the provincial level. The data enable identification of the effects of the TDP in a ten-year window following its implementation and, more importantly, the creation of a counterfactual based on eight pretreatment years. The data also allow us to control for relevant confounders and seasonality and enable us to implement a battery of placebo studies and robustness checks.

Our main results show that, after the TDP was implemented, employment in the hospitality sector in Salta increased by an average of 11 percent per year, for an overall impact of around 114 percent (750 new formal jobs), between 2003 and 2013. When considering the tourism value-chain (including the hospitality sector), employment increased by an average of 2.2 percent per year i.e. an accumulated impact of 1376 formal jobs. Additional analyses show that the TDP not

only did not crowd-out employment in other industries but also generated positive inter-industry employment spillovers/externalities. We find that for each job created in the tourism value-chain, an additional job was created in the rest of the provincial economy, which resulted in a total increase of 3750 new formal jobs due to the TDP. These results are robust across a series of placebo tests, robustness checks and different synthetic control groups.

This paper contributes to the existing literature in several ways. First, to the best of our knowledge, this is the first paper that examines the long-term causal effects of a large-scale RIP with only one treatment unit. The closest studies are related to a broader literature that evaluates business support policies and place-based interventions.⁵ This contribution is particularly relevant to the debate on the effectiveness of tourism policy.⁶

Second, this paper is also among the first applications of SCM to assess the impact of an economic development policy.⁷ Until now, SCM has been used to evaluate the effect of the introduction of reforms, events, and specific policies.⁸ SCM and the exhaustive empirical exercises presented in Annexure C can be very useful for the evaluation of a variety of policies with dual focus (location and industry), such as other RIPs, cluster development programs, value chain programs, and other regional and urban development policies and reforms.

Finally, the study contributes to the debate on the design of tourism policies in developing countries. As pointed out by Crotti and Misrahi (2015), identifying priorities, upgrading infrastructure, calibrating fiscal incentives and executing national and international marketing campaigns are among the key tasks necessary to succeed in developing the tourism industry. The TDP offers a successful case study of this integrated approach.

The rest of the paper is organized as follows. Section 2 discusses the rationale behind tourism policies, the background of the TDP, and a simple framework to motivate our empirical analysis. Section 3 presents the empirical methodology, and Section 4 describes the dataset and the sample. Section 5 presents the results. This section is followed by a set of placebo and robustness tests in Section 6. Section 7 explores other characteristics of the impact of the TDP, and Section 8 concludes.

2. Background

2.1. Tourism, employment, and policy justification

Tourism is one of the world's largest industries, particularly in terms of employment. According to the World Tourism Organization (WTO), in 2013, the tourism industry provided one out of every 11 jobs in the world, represented 9 percent of the world's GDP (direct, indirect, and induced impact), and generated 6 percent of the world's exports (WTO, 2014b). Annual international tourist arrivals worldwide jumped from 25 million in 1950 to more than one billion in 2013. Also in 2013, international arrivals in developing countries outnumbered those in developed economies.

⁵ See, for instance, Criscuolo et al. (2012), Freedman (2015), Kline and Moretti (2013), Romero (2009). For a detailed review and analysis of place-based policies see Neumark and Simpson (2015) and the references cited therein.

⁶ The few studies that have attempted to identify impacts in this area use simulation models (Ashley and Mitchell, 2009). These approaches, however, do not directly address causality and often fail to provide convincing evidence of the policy's net effects.

⁷ Gathani and Stoelinga (2013) and Barone et al. (2016) are probably the studies closest to an application of SCM to an economic development policy.

⁸ California's tobacco control program (Abadie et al., 2010), trade restrictions (Garcia Lembergman et al., 2015), a mileage tax for trucks (Luechinger and Roth, 2016), economic liberalization processes (Billmeier and Nannicini, 2013), terrorist conflicts and crime (Abadie and Gardeazabal, 2003; Gautier et al., 2009; Pinotti, 2015), catastrophic natural disasters (Barone and Mocetti, 2014; Cavallo et al., 2013), German reunification (Abadie et al., 2015), energy policies (Ando, 2015; Munasib and Rickman, 2015) and childcare (Bassok et al., 2014), and spillovers from universities (Bonander et al., 2016; Liu, 2015).

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