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journal homepage: [www.elsevier.com/locate/socscimed](http://www.elsevier.com/locate/socscimed)The political economy of diagnosis-related groups<sup>☆</sup>Paola Bertoli<sup>a</sup>, Veronica Grembi<sup>b, c, \*</sup><sup>a</sup> University of Economics, Prague, and CERGE-EI Teaching Fellow, Prague, Czech Republic<sup>b</sup> Mediterranean University of Reggio Calabria, Reggio Calabria, Italy<sup>c</sup> University of Economics, Prague, Czech Republic

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## ABSTRACT

A well-established political economic literature has shown as multi-level governance affects the inefficiency of public expenditures. Yet, this expectation has not been empirically tested on health expenditures. We provide a political economy interpretation of the variation in the prices of 6 obstetric DRGs using Italy as a case study. Italy offers a unique institutional setting since its 21 regional governments can decide whether to adopt the national DRG system or to adjust/waive it. We investigate whether the composition and characteristics of regional governments do matter for the average DRG level and, if so, why. To address both questions, we first use a panel fixed effects model exploiting the results of 66 elections between 2000 and 2013 (*i.e.*, 294 obs) to estimate the link between DRGs and the composition and characteristics of regional governments. Second, we investigate these results exploiting the implementation of a budget constraint policy through a difference-in-differences framework. The incidence of physicians in the regional government explains the variation of DRGs with low technological intensity, such as normal newborn, but not of those with high technological intensity, as severely premature newborn. We also observe a decrease in the average levels of DRGs after the budget constraint implementation, but the magnitude of this decrease depends primarily on the presence of physicians among politicians and the political alignment between the regional and the national government. To understand which kind of role the relevance of the political components plays (*i.e.*, waste vs. better defined DRGs), we check whether any of the considered political economy variables have a positive impact on the quality of regional obstetric systems finding no effect. These results are a first evidence that a system of standardized prices, such as the DRGs, is not immune to political pressures.

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## 1. Introduction

Health care expenditures is a major component of GDP and a competence of local governments in decentralized or federal settings. A remarkable political economic literature explores how multiple layers of government affect the level of taxation, the performance and quality of the public sector, and the level of a country's deficit. However, little attention has been paid to how politicians and their incentives affect the health care sector.

Political interests play a crucial role in the health care arena, as shown in recent work by Bloom *et al.* (2015, 2015) use the margin of victory in U.K. districts as an instrument for hospital competition at the local level. The instrument captures the fact that the lower the incumbent party's margin of victory, the less likely a hospital in that district is to close, as politicians do not wish to upset their constituents. This paper contributes to the literature inaugurated by Bloom *et al.* (2015) by empirically testing, for the first time with respect to health care, the commonly accepted prediction that multi-level governance affect the inefficiency of public expenditures. Our evidence is based on the relationships between characteristics of political institutions and the average levels of diagnosis-related groups (DRGs), particularly of obstetric DRGs.

Based on the cost function of a representative sample of hospitals, DRGs are a common mechanism for paying hospitals and measuring hospital activity within a country with the goal of reducing waste in health care (Kimberly and De Pouvourville, 2008; Paris *et al.*, 2010). However, the decision of whether and when to

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adopt DRGs is often left to local governments or insurers (Busse et al., 2011). In the 1980s, the US became the first country to introduce DRGs for its federal programs, Medicare and Medicaid. At present, new forms of DRG tariffs, such as the All Patients Refined DRGs (APR-DRGs), are employed at the state level to pay for both publicly funded programs and patients covered by commercial insurers. The implementation of the APR-DRGs varies, and each state makes adjustments to better match the characteristics of its population and case mix. Sweden also has a national DRG system, but counties, which are the local authorities responsible for the health care sector, can waive the national system to account for local needs. In Spain, the provinces have some discretion regarding the timing of DRG adoption. In Germany, the development of DRGs is driven by provider associations and sickness funds. In Italy—which is our testing ground—regions can either conform to the national DRGs or set their own.

To examine how the characteristics of local governments affect the average level of each DRG, we assume that each observed DRG is the sum of two components, a “true” DRG tariff and a non-market markup. The true DRG tariff is a function of at least two sets of variables: resident population characteristics and structural supply indicators such as the number of employees, the number of beds, and technological investments, which could affect the cost of providing a treatment. The non-market markup exists because it can be difficult to observe the true DRG value and this leaves ground for strategic manipulation of the tariffs: by definition, this markup must be positive. Improving the accuracy of the true DRG value implies an improvement in the efficiency of the health care system. Conversely, manipulating the markup and exploiting the lack of transparency in the system increase the inefficiency of the health care system. It is not possible to directly test the effect of the political characteristics on each component, but we provide an indirect test.

Our empirical strategy relies on Italian data. Italy provides a heterogeneous institutional setting to demonstrate the role of local governments in determining the level of DRGs, as it counts 21 regional health care systems and local government elections are staggered. We collected the DRG tariffs adopted by Italian regions from 2000 to 2013 for 6 obstetric DRGs: cesarean and vaginal delivery with and without complications, as well as severely premature and normal newborns. The differences in these DRG prices across regions can be substantial. For instance, in 2000, the payment for a vaginal delivery with no complications in Tuscany was almost 30% higher than that in the nearby Emilia Romagna and nearly 40% lower than that in the nearby Umbria despite the fact that Umbria, Tuscany, and Emilia Romagna have similar socioeconomic and population health characteristics.

To investigate the potential role of local government characteristics, we follow two strategies. First, using panel data at the region-year level, we test whether 5 regional government variables are relevant to our DRG outcomes. These variables are the percentage of politicians being doctors, the percentage of politicians with college degrees, the percentage of regional government officials not appointed through elections, a dummy variable indicating political alignment between the regional and national governments (*i.e.*, same political coalition), and the number of parties represented in the regional council. Second, we exploit a policy introduced in Italy in 2006 that forces regions with health care deficits to participate in a repayment plan. The goal of the repayment plan is to reduce the deficit through a general re-organization of the health care system. Since only some regions had to participate in this plan, we can implement a difference-in-differences approach including interactions for all the government characteristics considered to whether the latter affect regional governments’ response to the repayment plan with respect to DRG tariffs.

Under both strategies, any detected effect of politics on DRGs could reflect either a distortion or improved definition (*i.e.*, an efficiency gain) of the observed DRG price. In order to disentangle negative influences of government characteristics from beneficial ones, we exploit a unique dataset based on patient discharge records to generate proxies for obstetric quality. Then, we replicate both previously described empirical strategies using these proxies to determine whether any local government characteristics affect the quality of the obstetric system.

This paper is organized as follows. Section 2 presents the institutional background on the DRG system in Italy, its main developments in our period of interest, and background information on the repayment plan policy. Section 3 details the data used in the empirical analysis in Section 4. Section 5 presents the main results, and Section 6 concludes.

## 2. Institutional background

Italy counts 19 regions and 2 autonomous provinces (the Autonomous Province of Trento and the Autonomous Province of Bolzen), which are responsible for providing medical assistance to their residents. Local governments must comply with national standards (Lisac et al., 2008), but they can freely choose how to regulate and structure health care delivery within their territory. As a result, the country includes 21 micro-health care systems that rely on different mixes of local health authorities (LHAs), independent hospitals (*e.g.*, teaching hospitals) and private institutions (Anessi-Pessina et al., 2004). Patients are covered by health plans provided by LHAs according to their place of residence, but there is intra- and inter-regional mobility.

The Italian government released the first DRG tariff list with Legislative Decree 169/1994; the list was based on the DRGs classification developed in the US. As a result, since January 1995, all hospitals have been funded through a DRG-based system, which is enforced for every inpatient (Cavaliere et al., 2013). National tariffs were calculated based on data gathered from eight hospitals located in the Northern and Central regions without differentiating among hospital types (Fattore and Torbica, 2006). Hence, teaching hospitals were assumed to have the same production function as non-teaching hospitals.

National tariffs are only benchmarks, and regional governments can both set their own rates and adjust them by hospital type. The majority of regions have developed their own tariffs using cost assessments based on representative samples of their own hospitals, and only a few (6 in 2000 and 2013) conform to the national tariffs (Assobiomedica 2002). At the regional and national levels, DRG tariffs are based on the cost function of a sample of hospitals. Thus, an individual hospital is not able to request for a review of these prices based on its own budgets. Still, the setting of national and regional DRG tariffs is regulated by a Ministry of Health decree dated April 15, 1994. According to this decree, the tariffs are calculated by taking into account the cost of the personnel directly employed, the cost of materials and equipment used, and the general costs of the responsible ward. The latter costs refer to expenses that are not directly due to a specific treatment/procedure and are shared equally across the treatments provided by the ward. To ensure comparability and homogeneity in hospital cost accounting, the financial statements of health care providers must comply with the rules and the standardized layout established by the Inter-ministerial Decree of October 20, 1994, which was updated by Decree 118/2011.

Despite the common assessment and financial reporting rules, the differences between national and regional rates can be substantial. Fig. 1 plots the ratios of regional to national tariffs for two DRGs in 2000 and 2013: vaginal deliveries without complications

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