



UNDERSTANDING INAPPROPRIATENESS
IN HEALTH CARE. THE ROLE OF SUPPLY
STRUCTURE, PRICING POLICIES AND
POLITICAL INSTITUTIONS
IN CAESAREAN DELIVERIES

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Understanding Inappropriateness in Health Care.

*The Role of Supply Structure, Pricing Policies
and Political Institutions in Caesarean Deliveries* [♣]

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Abstract

JEL Classification

Keywords

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*2011 SIEP Conference
Congress
Meeting*

*2011 SIE Conference
2011 ERSA Congress
2011 LAGV Conference
2010 AIES Conference*

*2011 IIPF
2011 EPCS*

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#

1. Introduction

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2. Why are caesarean sections on the rise? A brief survey

et al.

Technological changes in deliveries

Changes in patients' preferences

Changes in physicians and providers behaviour

al.

et al.

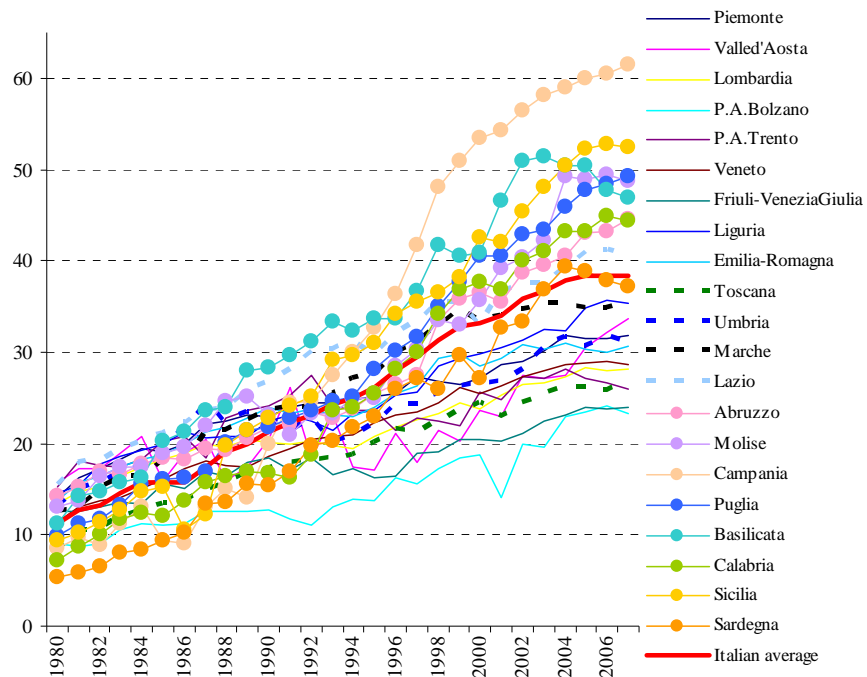
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3. Setting the stage: preliminary evidence on caesarean deliveries in Italy

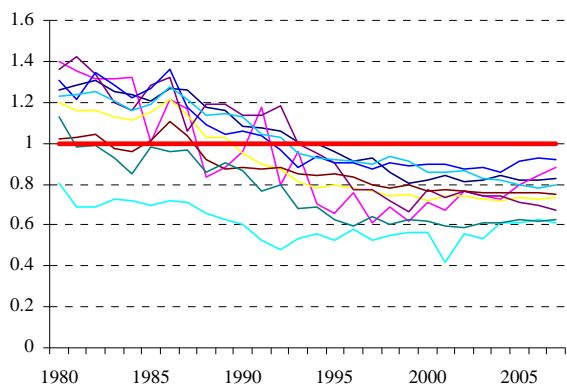
Figure 1. Caesarean deliveries in the Italian regions (share on total deliveries)



Note: continuous lines are used for Northern regions; broken lines for regions located in the Center; lines with circles for the South and the Islands.

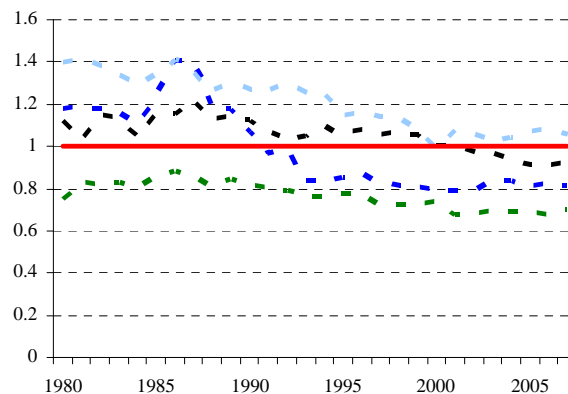
Figure 2. Caesarean deliveries in the Italian regions normalised with respect to national average

North



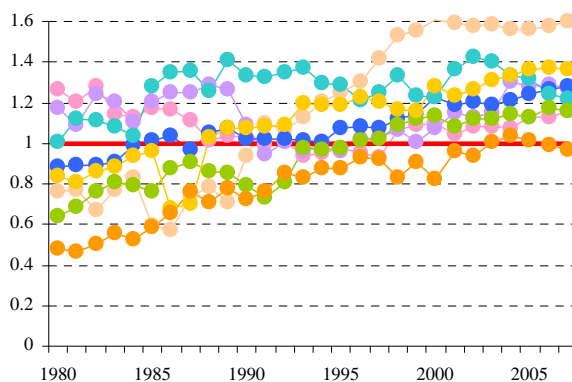
- Piemonte
- Lombardia
- P.A.Trento
- Friuli-VeneziaGiulia
- Emilia-Romagna
- Valled'Aosta
- P.A.Bolzano
- Veneto
- Liguria
- Italian average

Centre



- - Toscana
- - Umbria
- - Marche
- - Lazio
- Italian average

South and Islands



- Abruzzo
- Puglia
- Sicilia
- Molise
- Basilicata
- Sardegna
- Campania
- Calabria
- Italian average

Note: continous lines are used for Northern regions; broken lines for regions located in the Center; lines with circles for the South and the Islands

Figure 3. Casarean deliveries and share of discharges with complications

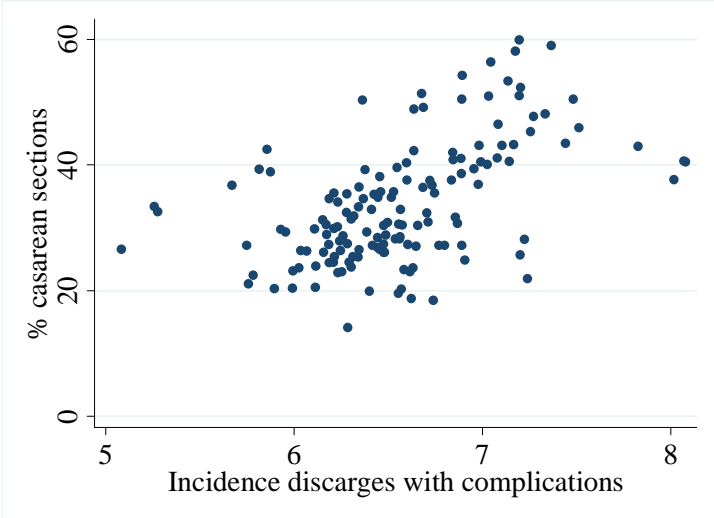


Figure 4. Incidence of caesarean sections and mother age

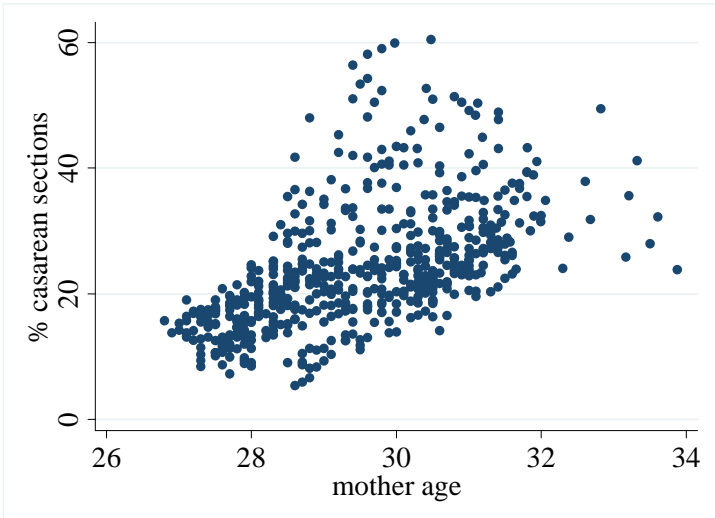


Figure 5. Incidence of caesarean sections and mother age by macro area

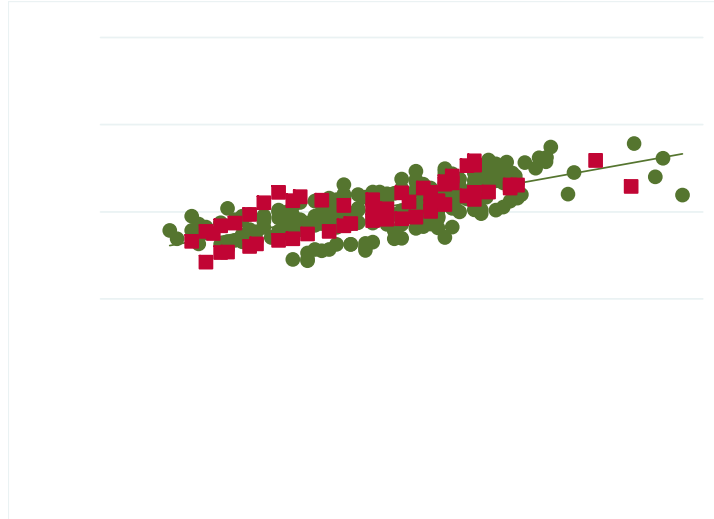


Figure 6. Incidence of caesarean sections and share of beds in private hospitals

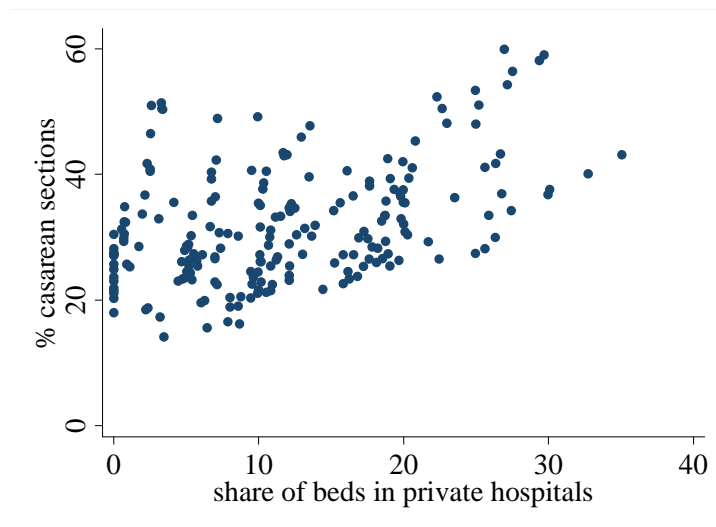
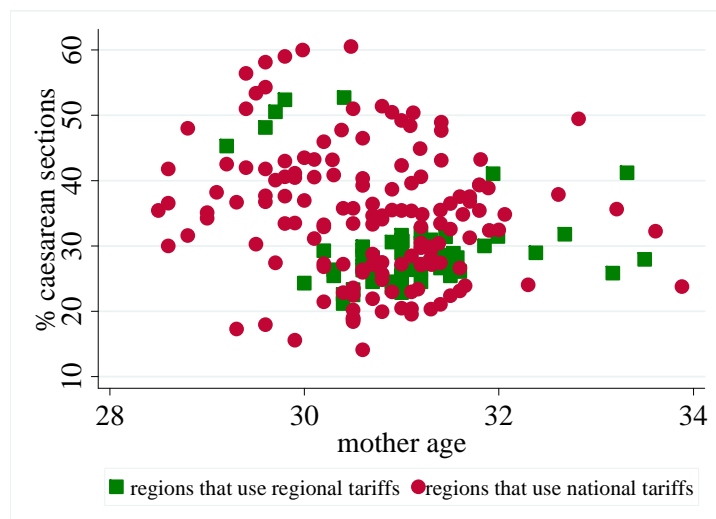


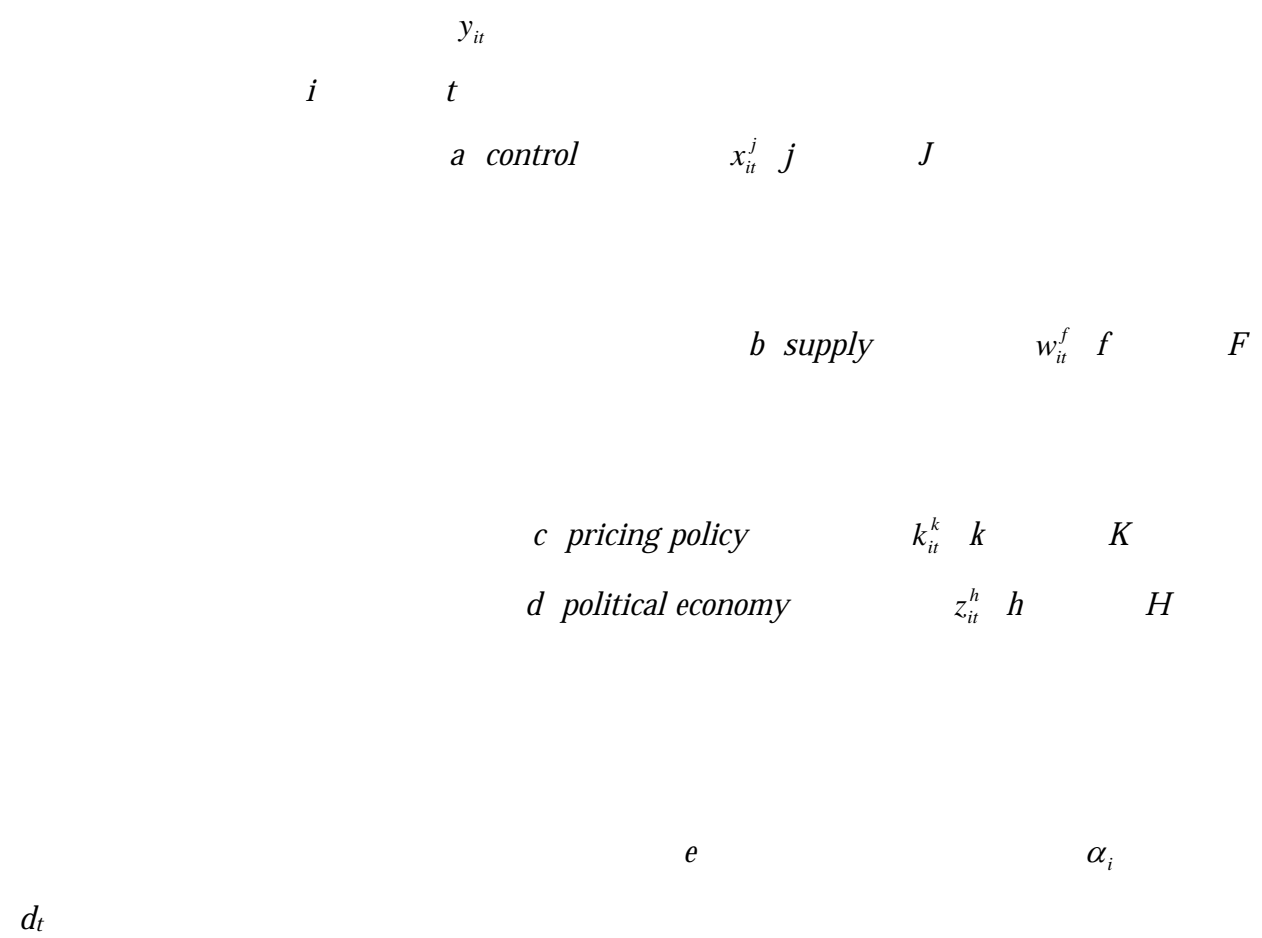
Figure 7. Incidence of caesarean sections and average mother age by regions that use national or regional DRG tariffs



4. The empirical strategy

4.1. Model specification

$$y_{it} = \alpha + \alpha_i + \sum_{t=1}^T \beta^t d_t + \sum_{j=1}^J \beta_j^x x_{it}^j + \sum_{f=1}^F \beta_f^w w_{it}^f + \sum_{k=1}^K \beta^k k_{it}^k + \sum_{h=1}^H \beta_h^z z_{it}^h + \varepsilon_{it}$$



4.2. Data

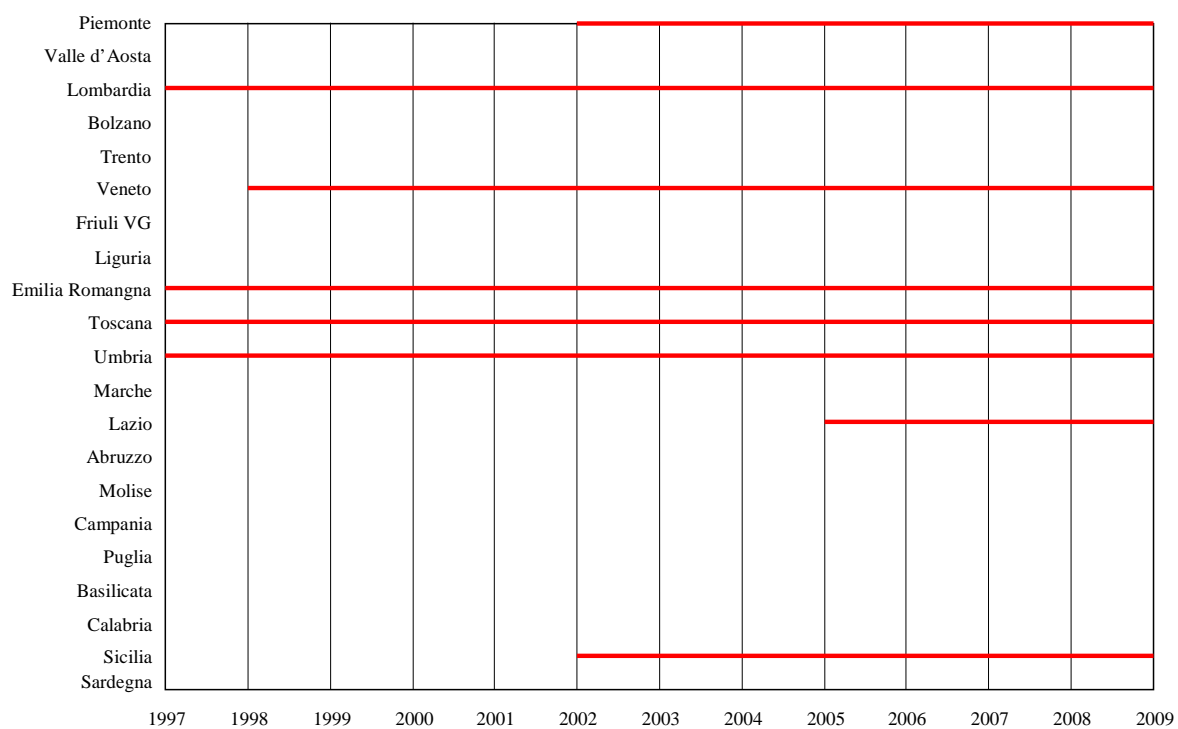
Table 1. Descriptive statistics

		# obs	mean	std. dev.	min	max
Dependent variable	<i>odds ratio of% caesarean deliveries</i>	189	-0.761	0.429	-1.805	0.403
Control variables (<i>x</i>)	mother's age	189	30.639	0.776	28.500	32.060
	birth rate	189	9.167	1.205	6.900	12.230
	% primary school educ (females)	189	18.241	3.435	10.083	26.244
	neonatal mortality (first 6 days)	189	11.419	5.380	0.000	37.105
Supply indicators (<i>w</i>)	medical staff (per 1000 residents)	189	54.559	3.212	47.031	59.612
	bed in private hospitals (ratio)	189	11.754	8.381	0.000	35.051
Pricing policies (<i>k</i>)	regional tariffs (dummy)	189	0.280			
Political economy indicators (<i>z</i>)	in line with central government (dummy)	189	0.508			
	share of own funding	189	0.380	0.149	0.065	0.728
	president gender (dummy)	189	0.963			
	president experience	189	3.190	3.010	0.000	15.000
	president is a doctor (dummy)	189	0.085			

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Figure 8. Time line of the introduction of regional tariffs in the period 1997-2009



Note: source data from Carbone et. al. (2006) and Agenas; a red line means the region has its own DRG tariffs.

Relazione Generale sulla Situazione Economica del Paese

5. Estimation results

5.1. Methodological issues

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Table 2. Equation (1): estimation results

Dep. variable: <i>log of odds ratio of % caesarean deliveries</i>		MODEL SPECIFICATION [§]				
		A	B	C	D	E
[a] <i>control variables</i> (x)	mother's age	0.138 *** <i>0.043</i>	0.142 *** <i>0.040</i>	0.144 *** <i>0.040</i>	0.141 *** <i>0.034</i>	0.129 *** <i>0.035</i>
	birth rate	-0.124 *** <i>0.020</i>	-0.124 *** <i>0.019</i>	-0.120 *** <i>0.018</i>	-0.103 *** <i>0.019</i>	-0.084 *** <i>0.021</i>
	% primary school educ (females)	0.013 * <i>0.007</i>	0.010 <i>0.008</i>	0.010 <i>0.008</i>	0.013 * <i>0.007</i>	0.011 <i>0.009</i>
	neonatal mortality (first 6 days)	0.003 <i>0.002</i>	0.003 * <i>0.002</i>	0.004 * <i>0.002</i>	0.002 * <i>0.001</i>	0.004 ** <i>0.002</i>
[b] <i>supply indicators</i> (w)	medical staff (% of total NHS employees)		0.008 * <i>0.005</i>	0.007 <i>0.005</i>	-0.000 <i>0.005</i>	0.003 <i>0.006</i>
	bed in private hospitals (ratio)		-0.001 <i>0.003</i>	-0.002 <i>0.002</i>	-0.002 <i>0.002</i>	0.001 <i>0.002</i>
[c] <i>pricing policy indicators</i> (k)	regional tariffs (dummy)			-0.137 ** <i>0.062</i>	-0.165 ** <i>0.071</i>	-0.260 *** <i>0.080</i>
	introduction of regional tariffs					0.066 ** <i>0.031</i>
	regional tariffs×(bed in private hospitals)			0.009 ** <i>0.003</i>	0.009 ** <i>0.004</i>	0.015 *** <i>0.005</i>
	introduction of tariffs×(beds in private hospitals)					-0.006 ** <i>0.003</i>
[d] <i>political economy indicators</i> (z)	in line with central government				-0.017 <i>0.017</i>	-0.013 <i>0.016</i>
	share of own funding				-0.411 *** <i>0.125</i>	-0.435 * <i>0.211</i>
	president gender				-0.013 <i>0.042</i>	-0.021 <i>0.042</i>
	president experience				-0.009 *** <i>0.003</i>	-0.010 ** <i>0.003</i>
	president experience×(in line with central government)				0.009 ** <i>0.004</i>	0.008 *** <i>0.002</i>
	president is a doctor				0.061 ** <i>0.025</i>	0.075 *** <i>0.018</i>
constant	-3.957 *** <i>1.283</i>	-4.487 *** <i>1.338</i>	-4.492 *** <i>1.367</i>	-4.029 *** <i>1.189</i>	-4.012 *** <i>1.267</i>	
# of observations	189	189	189	189	168	
within R ²	0.85	0.86	0.86	0.88	0.87	

Significance levels: 1% ***, 5% **, 10% *.

[§] Panel fixed effect estimation; robust standard errors in italics; all regressions include year dummies and region fixed effects.

5.2. The determinants of caesarean rates

ceteris paribus

control

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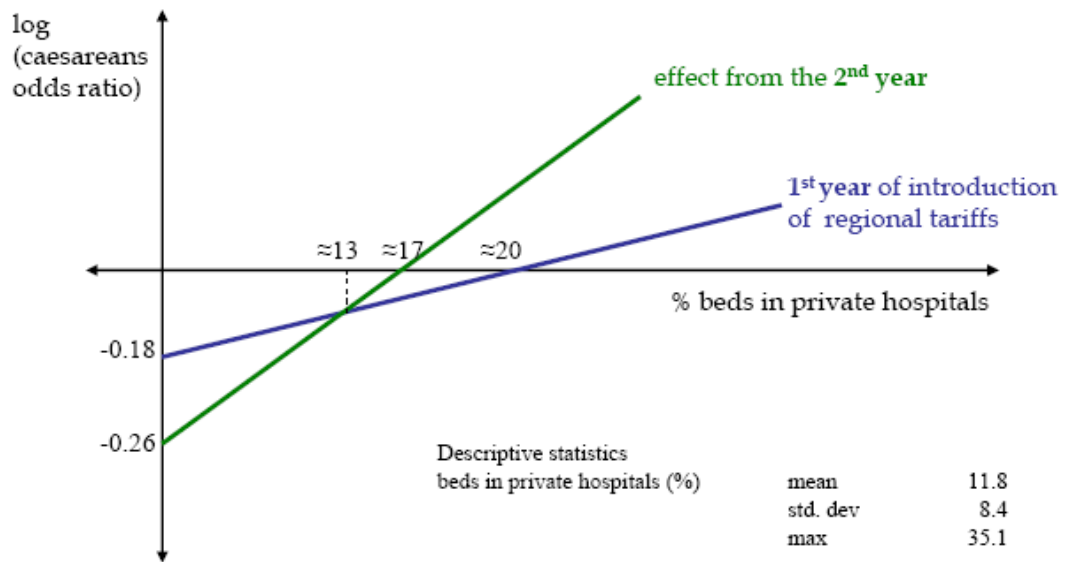
supply

pricing policy

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Figure 9. Graphical representation of the results on regional DRG tariffs



political economy

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6. Concluding remarks

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