Hardening Sub-national Budget Constraints via Administrative Subordination:
The Italian Experience of Regional Recovery Plans

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Introduction

- In many countries Central Government faces the problem of **hardening** the **budget of sub-national governments** to avoid deficits in fiscally decentralized contexts

- Different **mechanisms** have been proposed in the literature:
  - reducing **bailout expectations** in order to increase accountability of LGs (e.g., Bordignon and Turati, 2009; Piacenza and Turati, 2014, for Italian regions)
  - implementing different forms of **administrative subordination** (like appointing an accountant from the CG or imposing a Recovery Plan; e.g., Ben-Bassat et al., 2018, for municipalities in Israel)

Study motivation

- Schakel et al. (2018) investigated the effectiveness of different **fiscal rules** in controlling the **health budget** in 32 OECD countries

- They found a lagged positive and **significant effect** of fiscal rules on **cost containment**, especially when rules are set at both national and supranational level → however they did not investigate these **effects at LGs level** (regions or municipalities)

- Looking at the **Italian experience** of **regional recovery plans** (RPs), we seek to provide insights on the impact of fiscal rules introduced **since 2007** by the CG on regional health care systems' performance

Study objectives

- We investigate if RPs have reached their objectives in terms of **cost containment**, while ensuring an **acceptable provision** of health care services

- In particular, we test whether:
    1. RPs affected:
        - ✓ Health *expenditure*
        - ✓ Health *care supply*
        - ✓ Health *care access*
        - ✓ Health *outcomes*

    2. different types of RPs (**soft vs. hard**) perform differently

Data

- Data on **RPs** comes from the Italian Ministry of Health

- Data on **health supply**, **outcomes** and **patients' satisfaction** comes from "Health for All" OECD database

- Data on **health care services access** and **efficiency** comes from the periodic monitoring of the provision of the basic package (Griglia LEA) published annually by the Italian MoH

- Data on **health care expenditure** comes from the reports published annually by the MEF

Empirical strategy 1/2

- The observation period is **2000-2014** ($T = 15$)

- Focus on **Ordinary Statute Regions** ($N = 15$)

- We use a standard **Difference-in-Differences** approach:

$$y = \beta_0 + \beta_1 RP_{i,t} + \gamma X_{i,t} + \alpha_i \sum region_i + \alpha_t \sum year_t + \alpha_{jt} \sum area_j * year_t + \varepsilon_{it}$$

- y: health care expenditure, health care supply, health services consumption, health care system efficiency, health outcomes, patients' satisfaction

- $RP_{i,t}$ ($RPS_{i,t}$) is the **treatment variable** used to compare regions under a (hard) recovery plan to the others

- $region_i, year_t$: region and year fixed effects

- $area_j * year_t$: macro-area specific year effects (North, Centre, South) to account for potential confounding effects of the economic crisis since 2007

Empirical strategy 2/2

- $X_{i,t}$: controls

- all models control for **socioeconomic variables** (population size, working age individuals, % population +85, household size, occupation rate, youth unemployment, nr. of poor households, % population with university degree, per capita GDP)

- models considering **expenditure** as dependent variable also control for **consumption and supply** of health care services

- models considering **satisfaction** as a dependent variable also control for the regional **supply structure**

- In a **first specification** we look at the **general average effect** of RPs and do not distinguish between recovery plans with (hard RPs) or without supervisor (soft RPs)

- Main evidence:
  - Significant **reduction** in per capita **health spending** (in particular, spending on wages)
  - Significant **decrease of hospital beds** (in particular, those devoted to rehabilitation) and in the involvement of **private providers**, as well as a reduction in **public personnel**
  - A slightly significant **increase** in the coverage of **MRR vaccination**, as well as a **reduction** in **flu vaccination** coverage in the elderly

- In order to tackle **possible endogeneity** of our independent variable, we used as **instrument for RP** the **% of people complaining on dirt in streets** in 2005, interacted with a dummy variable with value 1 after 2007

- Most of findings are **confirmed**, with interesting differences in some items:
  - The **reduction** in spending on wage is not significant, but there is a significant reduction in the **spending on general practice**
  - There is a significant **increase** in the **regional funding of health spending** with own tax revenues
  - The decrease in hospital admission rates is not significant, while the **reduction** in **public personnel** is **greater** and involves both doctors and nurses
  - There is a relevant **reduction** in the **diagnostic admission rates**

Spending

VARIABLES	OLS	IV (Instr: dirt of streets)
pc public spending	-37.2650***	-45.1115*
	(13.058)	(23.756)
pc spending on wages	-14.9042***	2.9275
	(4.705)	(9.772)
pc spending on drugs	1.7789	7.1290*
	(2.234)	(3.354)
pc spending on consumables	6.5433	4.9834
	(4.106)	(8.839)
pc spending on general practice	-1.0958	-15.0578***
	(1.702)	(3.679)
pc spending on social care	-8.9369	-1.4568
	(8.685)	(14.707)
share of regional coverage	0.7168	4.6633***
	(0.597)	(1.221)

Supply

VARIABLES	OLS	IV (Instr: dirt of streets)
hospital bed rate	-1.4166**	-1.9794
	(0.687)	(1.232)
hospital acute care bed rate	-0.8079	-1.4873
	(0.571)	(1.068)
hospital rehabilitation bed rate	-0.6145***	-0.4994
	(0.226)	(0.403)
share of private NHS beds	-0.9840*	-1.6893*
	(0.588)	(0.9536)
public personnel	-928.4947**	-3,471.4425***
	(364.018)	(828.067)
public doctors	-59.6824	-490.4594**
	(108.083)	(225.459)
public nurses	188.8516	-1,826.2507***
	(247.546)	(592.415)

Access

VARIABLES	OLS	IV (Instr: dirt of streets)
admission rate	1.5749	-5.9333
	(3.222)	(5.983)
diagnostic admission rate	1.0708	-14.1385***
	(1.557)	(3.618)
medical admission rate	8.9889*	-5.7766
	(4.630)	(9.105)
surgical admission rate	-0.1414	-1.0444
	(0.407)	(0.831)
potentially inappropriate adm.	0.0033	0.0120
	(0.008)	(0.013)
coverage MMR vaccination	2.0094**	2.0768
	(0.974)	(1.556)
coverage flu vaccination	-1.8548*	-4.5980**
	(1.083)	(1.961)

Health Outcomes

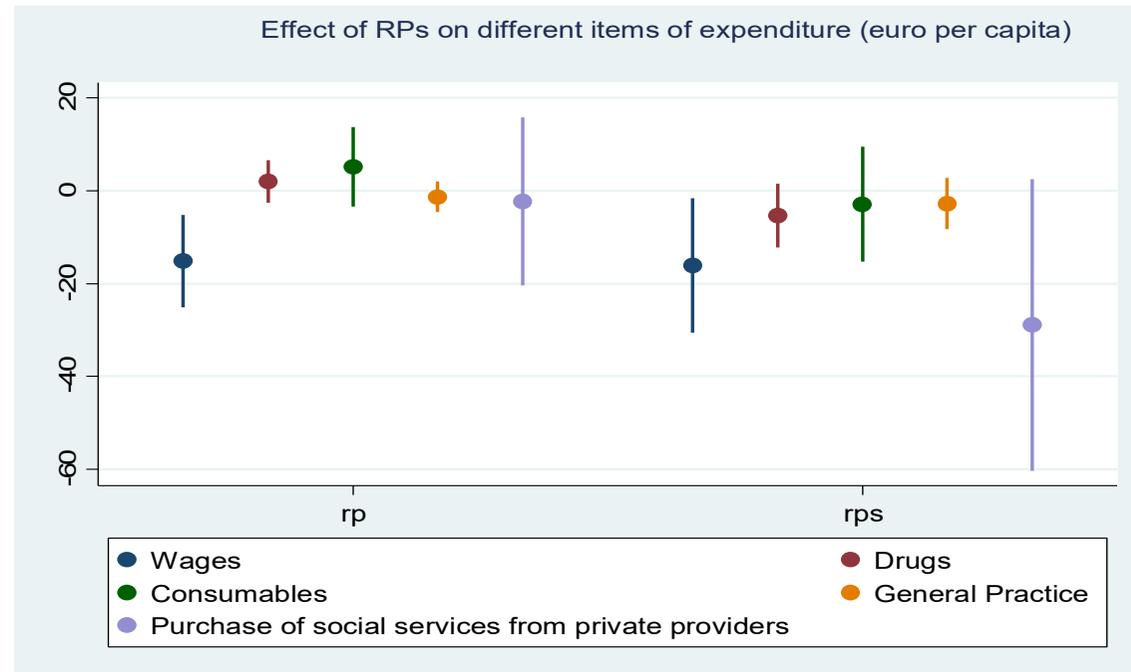| VARIABLES	OLS	IV (Instr: dirt of streets)
mortality rate	-0.4276	0.3010
	(0.397)	(0.732)
IMR	2.5138	4.4424
	(2.150)	(3.080)
satisfaction	0.9125	-4.7124
	(2.098)	(3.823)

Does the type of RP matter?

- In order to understand whether **different types of plans** (with and without supervisor) **perform differently**, we estimate – with the same dependent variables – the following model:

$$y = \beta_0 + \beta_1 RP_{i,t} + \beta_2 RPS_{i,t} + \gamma X_{i,t} + \alpha_i \sum region_i + \alpha_t \sum year_t + \alpha_{jt} \sum area_j * year_t + \varepsilon_{it}$$

where $\boldsymbol{RPS_{i,t}}$ allows to distinguish the **additional effect** on y of the appointment of an **external supervisor**

(1) Did the RP reduce health care expenditure?

- Per capita **public health expenditure decreased significantly** by 33.48 euros in the regions subject to a regular RP (p=0.014). Such an **effect** is 55.28 euro **larger** in regions under **hard recovery plan** (p=0.019)

- The effect of RPs on the share of public health care spending covered by regional tax revenues is small and non-statistically significant (+0.61 percentage points, p=0.262, for RP and +1 percentage point, p=0.287, for RPS)

Effect of RPs on different items of expenditure (euro per capita)

Legend:
- Wages
- Consumables
- Purchase of social services from private providers
- Drugs
- General Practice

Effect of RPs on expenditure items. All models control for: sociodemographic and supply variables, surgical admissions rate and hospital migration
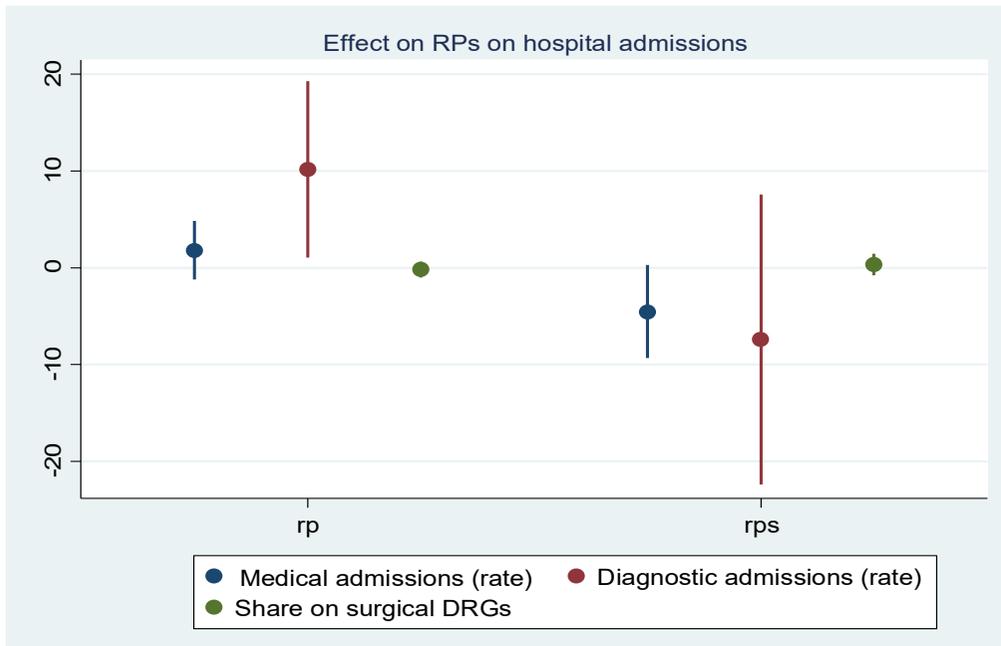
(2) Did regions under plan reduce health care supply?

- Limits to the number of hospital beds have been imposed in **all regions**, while specific measures concerning the block of personnel turn-over have been designed for regions under RPs

- A significant **reduction** in the rate of **NHS hospital beds** (-5.48, p=0.000) has been observed in regions **under RPS**

- The **number of NHS personnel** (including medical and nursing staff as well as administrative and technical staff) has **decreased** by 2068 units in regions **under RPS** (p=0.000)

- The mean reduction in **medical** and **nursing staff** is -580 (p=0.000) and -1101 (p=0.019), respectively
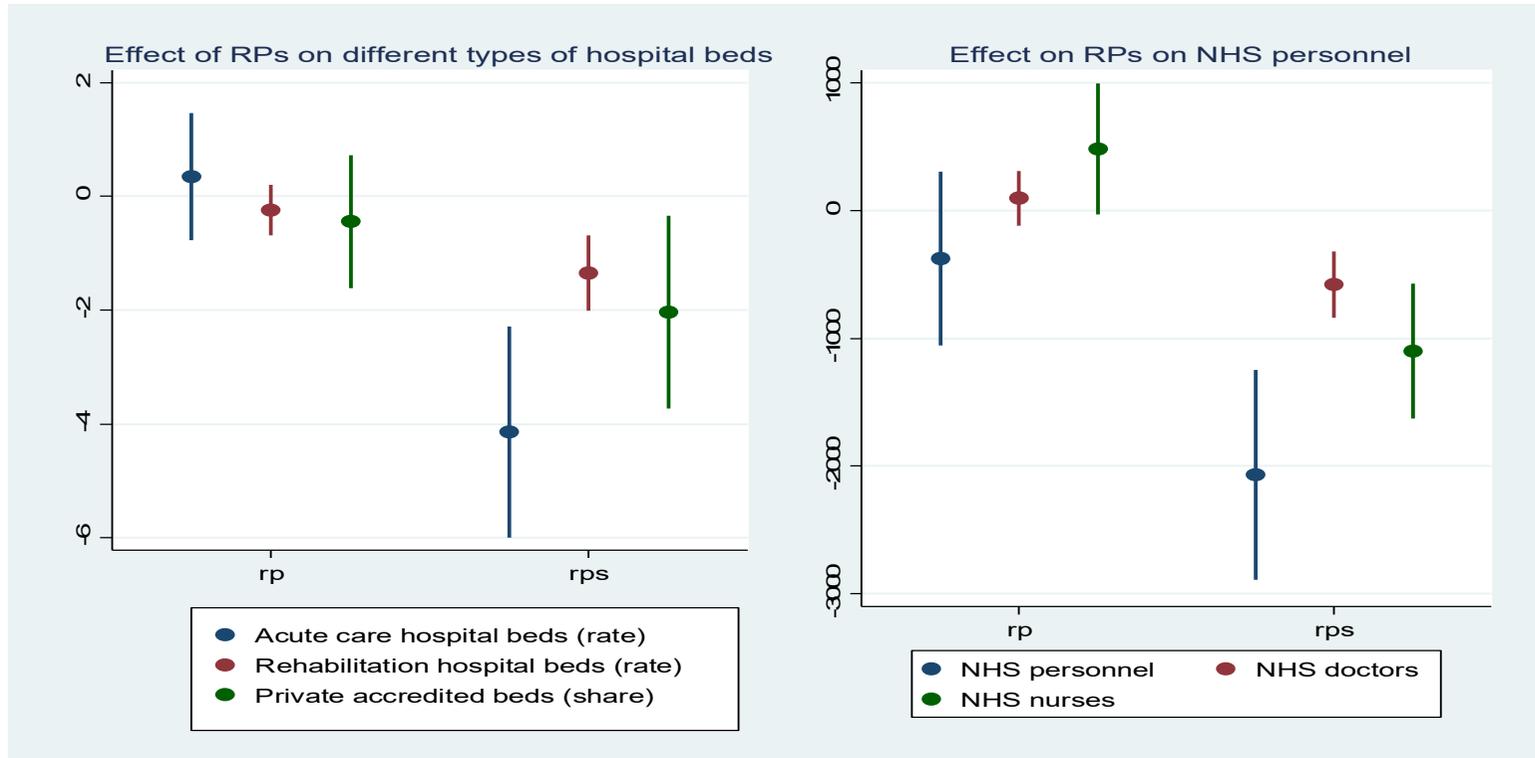
Effect of RPs on the supply structure. All models control for sociodemographic variables

(3) Did the RPs determine a reduction in health care access?

Effect on RPs on hospital admissions

Medical admissions (rate) ● Diagnostic admissions (rate) ●
Share on surgical DRGs ●

Effect of RPs on different types of hospital admissions. All models control for sociodemographic variables, surgical DRG rate and hospital migration. Moreover, with the exception of the third model (green plots), the surgical DRG rate has been included as a control variable

- The RPs seem to **not have affected** the **access to services** measured in terms of hospitalization rates

- Regions seem to have made **efforts to improve efficiency**

- The potentially **inappropriate DRG rate** on the total DRG has **decreased** by 4 percentage points in the **regions under RPS** (p=0.016). The effect of hospital migration on this indicator of appropriateness is limited and negative (-0.8 percentage points, p=0.083), while the surgical DRG rate affects it positively (+0.6 percentage points, p=0.003)

(4) Did RPs affect health negatively?

- RPs did **not** generate **significant effects on the mortality rate** nor on the infant mortality rate, which is more closely linked to the performance of the health care services

- We found **no differences** in the **% of satisfied patients** between the regions subjected to RPs and the other, even controlling for sociodemographic and supply variables, surgical DRG rate and hospital migration
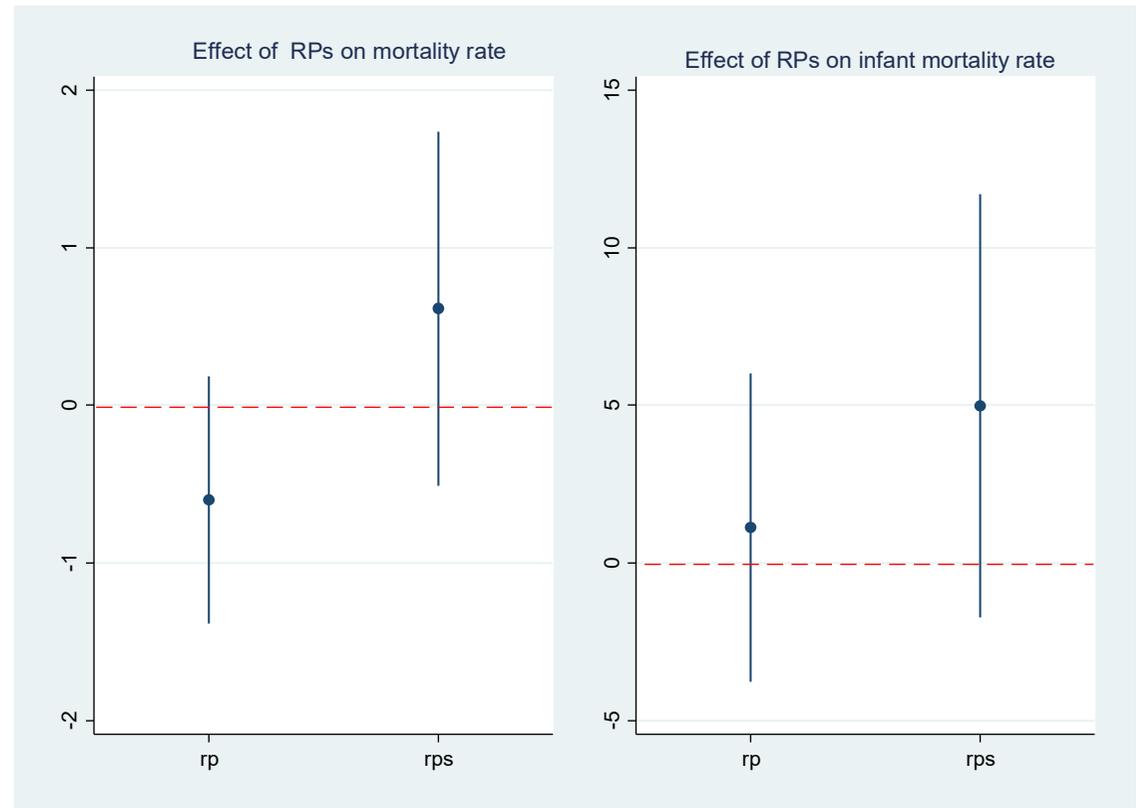
Effect of RPs on mortality. The models control for sociodemographic variables

Robustness checks

1. Use **RPS** as the **only treatment variable** → coefficients for RPS are now greater compared to those of the base case, but smaller than the overall effect of the recovery plan (i.e., the coefficient of RP + the coefficient of RPS). Statistical significance and sign do not change

2. Restrict the analysis to the **subsample of regions** that have ever been **subject to any recovery plan.** Only the hard recovery plan is considered as a treatment → the **effects** of RPs are **similar in size and sign** to their analogues obtained with the full sample of regions, but statistical significance is weaker

3. Investigate possible **announcement effects** that might have affected regions' behaviors prior to the enrolment in the plan → **no significant effect**

Discussion and conclusions (1/2)

- **Regional governments** enrolled in recovery plans have been **historically less virtuous**, being characterized by higher health care spending and poorer health care outcomes. The **RPs seem to have reduced**, at least to some extent, the **distance** between those regions and the **best performing one**

- Regions under a **hard recovery plan** (RPS) have experienced a **larger reduction** of health care expenditure, especially through a reduction of **inefficient health care supply**

- The **effect of soft RP** is **smaller** in size than the effect of RPS → **Regions** that faced only soft RPs were, already at the eve of the introduction of recovery plans, **more similar**, in terms of both spending and outcomes, **to the virtuous ones**

Discussion and conclusions (2/2)

- RPs have led to a **reduction in health spending**, especially in the regions facing hard recovery plans, which encompass the presence of a **supervisor appointed by the central government** to watch over the actual implementation of the plan

- The reduction in spending was achieved through **policies** involving the **block of staff turnover**, the **rationalization of beds**, and the commitment to **improve the appropriateness** of hospital admissions

- These levers have **not determined rationing in access** to health care services or a **deterioration in health**. Furthermore, the advent of plans does not seem to have compromised the **perceived quality of services**

- Further investigation: **differences** in the effects of **RPS** according to the **type of external supervisor** (technicians vs. politicians)?

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Definition of variables

Health care expenditure	Health care supply	Health Care Access	Health Outcomes	Patients' satisfaction
Per capita health care expenditure	Rate of public and private accredited beds	Hospital admission rate	Mortality	Share of patients satisfied/very satisfied with hospital assistance
Per capita expenditure on wages	Rate of public and private accredited beds for acute care	Rate of diagnostic admissions	Neonatal mortality	
Per capita pharmaceutical spending	Rate of public and private accredited beds for rehabilitation	Rate of medical admissions	Infant mortality	
Per capita spending on consumables	Rate of private accredited beds	Rate of surgical admissions	Diabetes mortality	
Per capita spending on general practice		Rate of potentially inappropriate admissions	Psychic disorder mortality	
Per capita spending on social services from private sector			Heart disease mortality	
Share of health care spending covered by regional taxes				

Trend of dependent variables
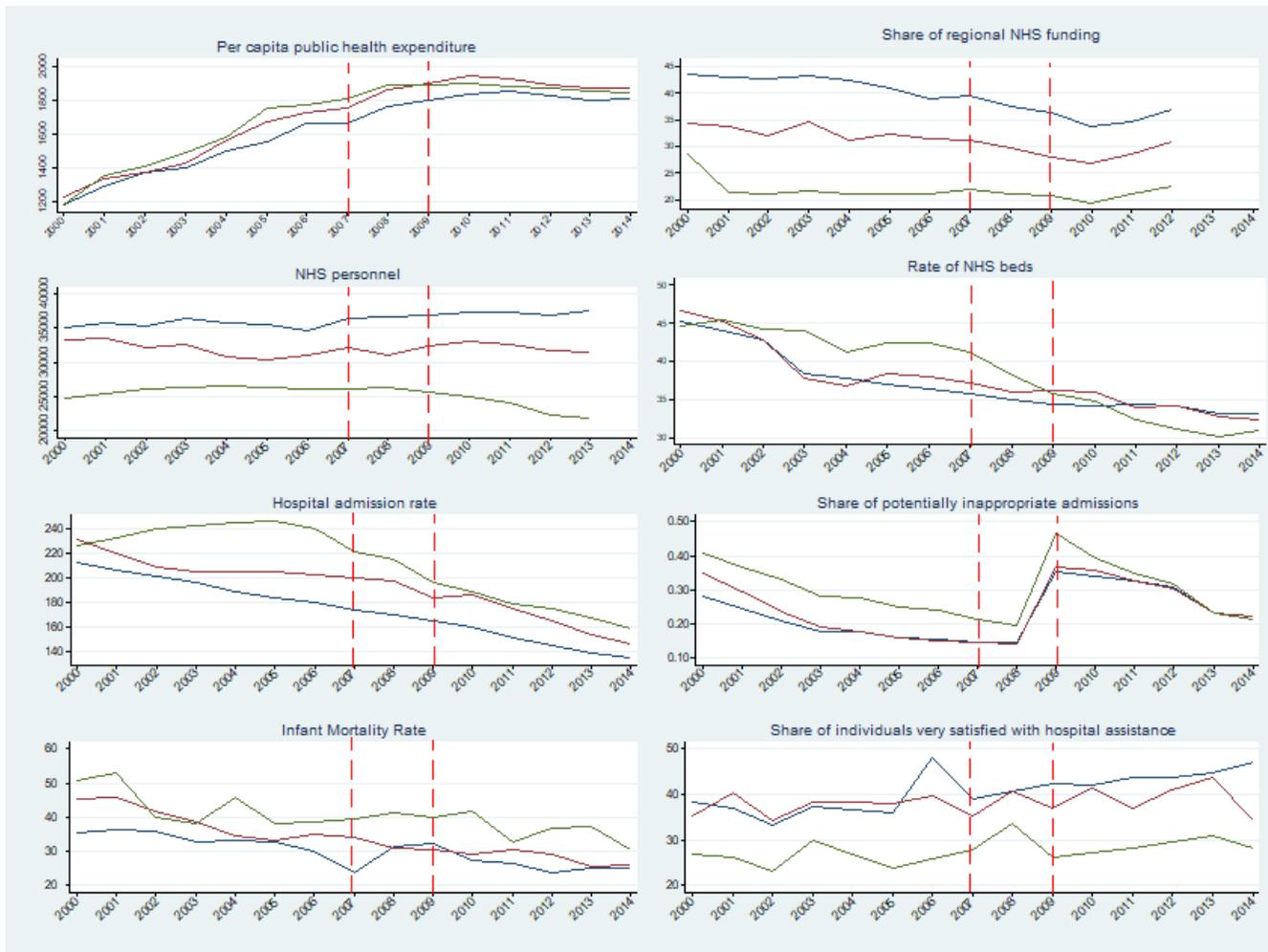
Legend:

- blue line = no plan
- red line = regular recovery plan
- green line = recovery plan with supervisor
- dashed line = reference line for 2007 and 2009