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Do Harder Local Budget Constraints Affect Patient Mobility?

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Abstract

A recent article by Bordignon et al. (2020) looks at the experience of Financial Recovery Plans (FRPs) imposed on regional governments running large fiscal deficits in the management of Health Services, finding convincing evidence that FRPs led in Italy to a significant containment in health spending and almost entirely wiped out regional deficits. The article also suggests that FRPs did not produce any significant deterioration in the quality of health services and in citizens' health. In this paper we reconsider the effects that FRPs may have produced on health services, by focusing on patient migration. By reframing the empirical analysis within the relevant strand of literature that considers migration as mainly driven by the supply side features of the healthcare systems (Levaggi and Zanola, 2004) and by considering the announcement effects related to this form of fiscal discipline, we estimate an increase in patient mobility in the range 15-18% as due to FRPs (18-25% when a commissioner is appointed). Our results suggest that the improvements in fiscal discipline may have widened the quality gap in the health services regionally delivered, with undesirable consequences in terms of increased disparities in the distribution of access opportunities to healthcare.

JEL Classification: H75, I14, I18

Keywords: Recovery Plans; Patient mobility, Equality of access to healthcare

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1. Introduction

A recent valuable paper by Bordignon et al. (2020) looks at the experience of 'administrative subordination' in Italy, namely the experience of Financial Recovery Plans (FRPs, from now on) imposed on regional governments running large fiscal deficits in the management of Regional Health Services. Although the paper mainly investigates whether these plans have been effective in restoring sound conditions for public finances, it is also concerned with their possible perverse effects on the provision of healthcare, hence on citizens' health. Using a standard Differences-in-Differences (DD) approach, the paper estimates an empirical model on a panel of Italian regions observed between 2000 and 2014, finding convincing evidence that FRPs led to a significant containment in the growth rate of health spending and almost entirely wiped out regional deficits. In addition, the paper finds that these effects are significantly stronger in regions where a commissioner appointed by the central government is in charge to enforce the plan in case of non-compliance. Besides, the paper presents evidence suggesting that FRPs do not seem to have either rationed the use of healthcare services or implied a significant deterioration in the perceived quality of health services and in citizens' health. Indeed, no statistically significant effects of FRPs on health outcomes or patients' satisfaction is found.

One possible indicator of perceived poor quality of health services or denied access to healthcare is given by patient mobility, which may be seen as an instance of the Tiebout (1956)'s conjecture of voting with one's feet. As patient mobility consists of the flow of people who move from their own region of residence to satisfy healthcare needs elsewhere, to investigate whether FRPs have affected the quality of health services, it is crucial to test whether FRPs have conditioned patient mobility in a systematic and sensible way. It is on the other hand pretty obvious that any effect on patient mobility due to a decrease in the adequacy of healthcare regionally provided, adversely affects potential access to healthcare, worsening the distribution of healthcare opportunities (e.g. Abatemarco et al. 2020; Perucca et al. 2019).

As this was not the main focus of the paper, Bordignon and co-authors only marginally tested for the hypothesis that FRPs may have triggered more intense inter-regional flows of patients. Their results show a slight increase in mobility (+0.43 percentage points) for regions under FRP, with an additional effect of +1.74 percentage points due to the presence of a commissioner. They alert the reader to be cautious, however, in interpreting the impact of FRPs on hospital migration in a causal way, since their IV estimates show a coefficient which is not statistically significant.

In this paper we reconsider the effects that FRPs may have produced on patient mobility by extending the analysis by Bordignon and co-authors along two directions. First, we re-frame the analysis by considering the relevant strand of literature that considers patient mobility as a phenomenon mainly driven by the supply side components of the healthcare systems (Levaggi and Zanola, 2004; Fabbri and Robone, 2010). Second, we consider the announcement effect of a stricter fiscal discipline on regions running large fiscal deficits but not yet subjected to the FRP.

As far as the first point is concerned, we suggest that FRPs have affected patient mobility only indirectly, by modifying key characteristics of healthcare provision. Thus, if one accounts for variations in relevant supply side conditions, the estimated effect of FRPs on patient mobility clearly disappears. This does not mean, however, that FRPs have no effect on patient mobility, for these variations in supply-side conditions are not, to say, autonomous. Rather, they are the main consequence of the fiscal discipline implemented through the FRP.

As a second novelty, we try to account for a possible announcement effect following the introduction of a stricter fiscal discipline in the management of healthcare services. Indeed, there are grounds to argue that since its introduction in 2007, the discipline of the FRPs has strongly conditioned regional governments' fiscal behaviour. In particular, regions running larger fiscal deficits - and then, for this reason, subsequently subjected to FRPs - in the attempt to avoid any limitation in their prerogatives, acted differently from what they would have done if the FRP legislation had not been in force. In practical terms, this implies that in running our DD estimates we consider, as post-treatment period, all the years since 2007 on, and define as treated - for any single year of the whole post-treatment period - any region that subjected to the FRP at some point in time.

Our analysis is based on a panel of twenty Italian regions observed over the period 2003-2017. As a first step, we replicate the analysis by Levaggi and Zanola (2004), whose study aimed at identifying the determinants of inter-regional patient mobility in Italy, grounding on a sample of regions observed over the period 1994-1997. Our results suggest that some supply-side features of the regional health services, as identified in the Levaggi and Zanola's study, are still able to account for much of the regional variation in mobility. As a second step we carry on a DD analysis in the same spirit of Bordignon et al. (2020). This analysis shows a stable and persistent effect of FRPs on mobility. Such effect vanishes only when introducing those controls identified as relevant to explain patient mobility in the first step of the analysis. These results are consistent with the idea that FRPs produce their effect indirectly, by modifying key characteristics of healthcare supply. Thus, if one accounts for variations in relevant supply side conditions, the effect of FRPs on patient mobility loses its statistically significance.

Our results are robust to several econometric specifications, and, in terms of economic significance, suggest an increase in patient mobility in the range 15-18% as due to the introduction of FRPs. Results are even stronger when considering the presence of a commissioner: our findings show an increase in patient mobility of about 18-25%.

In a policy perspective, we advocate that the undeniable improvements in the fiscal discipline of subnational levels of governments, as found by Bordignon et al. (2020), may have widened the quality gap in the health services regionally delivered - as witnessed by the increase in patient mobility - with obvious consequences in terms of increased disparities in the distribution of potential access to cares.

The paper is organized as follows. In Section 2 we briefly survey some key characteristics of the Italian NHS. Section 3 presents some preliminary evidence. In Section 4 we replicate the analysis by Levaggi and Zanola (2004) on the determinants of inter-regional patient mobility. In Section 5 we illustrate our DD analysis. Section 6 concludes.

2. A (very) short description of the Italian NHS

The Italian National Health Service was established by Law 833/1978, with the aim of putting into practice the principles of universal coverage and non-discriminatory access to healthcare. Without jeopardizing these principles, a constitutional reform implemented in 2001 expanded the role and competencies of regional authorities. Basically, the reform aimed at rebalancing power and competencies between central and local governments, leaving to the former the task of coordinating regional health policies in line with the goals set at the central level (mainly related with the general purpose of granting anyone with a basic level of cares). The Constitutional reform thus marked the transition towards a NHS organized at a regional level. Such a reform entailed a reduction in transfers from the central to local governments and, at the same time, an increase in the proceeds of local governments from their own sources.

In 2006, the total yearly regional fiscal deficit amounted to six billion of euro. Northern regions were responsible for 23% of these new debts. Regions from the Centre (36%), Southern regions (21%) and Islands (20%) were responsible for the rest.

A Law passed in December 2006 introduced Financial Recovery Plans as the main tool to keep regional fiscal deficits under control. Starting from 2007, any region exhibiting fiscal deficits above a specific total funding threshold, initially set at 7% and then lowered to 5%, can agree with the central government on the steps to be taken to restore an acceptable dynamics of the health care budget, by increasing revenues from taxation and keeping public healthcare expenditure under control.

The provisions of any FRP last for three years. Such provisions affect both revenues (i.e., automatic increases of regional taxes) and costs (i.e., hiring limits and various other limitations that impinge upon structural endowments, such as, for example, the number of hospital beds). At the end of the third year, if the objectives set out in the FRP are not achieved, it is automatically renewed for three additional years.

Whenever compliance is not ensured, the central government can appoint an external commissioner in charge of implementing a tougher version of the FRP. Indeed, the appointment of a commissioner is generally accompanied by both an increase in taxes and a cut of resources in favour of the region. In addition, such an appointment generally requires some key regional health managers to be replaced. As the commissioner is not responsive towards voters, he/she is generally more able in implementing unpopular reforms, such as for example closing hospitals or reducing the number of beds available for hospitalization.

As convincingly shown by Bordignon et al. (2020), FRPs have shown up as good instruments to control the evolution of regional expenditure and to reduce regional fiscal deficits, with stronger efficacy whenever the government appoint a commissioner. Have these effects materialized without any relevant consequence on the quality of healthcare regionally provided?

One could argue that given the provisions of FRPs, the impoverishment of the supply side conditions is *in re ipsa*, so it does not need to be proved. However, such argument clashes with the possibility that FRPs have boosted efficiency in the management of health care resources, so that cuts in spending have occurred without jeopardizing the quality of the regional healthcare system.

We conjecture that this is not the case, however, and think that, if ascertained, an increase in patient mobility would provide evidence in favour of an impoverishment in the quality of healthcare regionally provided.

3. The impact of FRPs on Patient mobility: preliminary evidence

According to the general rules that characterize the Italian NHS, patients are free to get access to healthcare from any provider within or outside the region of residence. There are no constraints. In such a context, it is clear that the effective, or simply the perceived, quality of healthcare services provided at the regional level, affects patients' decisions to get healthcare outside the region of residence.

Following the extant literature, there are several ways to define patient mobility. In this paper, we consider the *escape rate*. Specifically, for any region i at year t we compute mobility as the ratio between the number of individuals from region *i* hospitalized in region *j* (with $j \neq i$) and the total number of individuals resident in region *i* hospitalized at time *t*. The *escape rate* thus indicates the share of healthcare needs proper of a given region that are not met therein. Figure 1 shows the evolution of the *escape rate* over the period 2003-2017 with regard to the five geographical macro areas in which Italy is commonly partitioned. From an aggregate perspective, it is evident since 2007 an increase of this index for southern regions. Symmetrically, the *escape rate* shows a tendency to decrease in regions located in the North, and, more precisely, in the North-West.

[Fig 1 near here]

Figure 2 vividly illustrates the presumed effect of the piece of legislation introducing FRPs. The upper graph in this figure considers the evolution of the *escape rate* by partitioning Italian regions into two groups: those subjected to the discipline of FRP at some point in time after 2007 (red line), and those never subjected to such a discipline (blue line).

[Fig 2a near here]

The figure also suggests that the evolution of the *escape rate* in the two groups followed a common trend until 2006 (grey lines). A striking divergence can be noticed afterwards. The curves capturing the evolution of the *escape rate* in the two groups of regions cross in 2009 and sensibly move away from each other afterwards.

The graph on the bottom of Figure 2 tells a similar story. In this case, the two groups are identified by separating regions whose healthcare services has been run by a commissioner appointed by the Ministry of Health at some point in time (the red line), from all the other regions simply subjected to FRP (the blue line).

[Fig 2b near here]

The divergence in the *escape rate* following the reform implemented in 2007 is evident. Such divergence seems mainly to depend on an exceptional and seemingly otherwise inexplicable increase in patient mobility following the appointment of the commissioner.

Fig 2b also depicts the presumed counterfactual, i.e. the expected trend for the *escape rate* in the two groups of regions had the legislation on FRPs not been put in force.

4. Framing Patient Mobility in Italy

The seminal paper to uncover the determinants of interregional patient mobility in Italy is due to Levaggi and Zanola (2004). It is based on a modified gravity model that exploits information on patient migration over the period 1994–1997. The theoretical framework considers net migration flows as a function of regional relative per capita income and regional hospital quality attributes, and leads to the following equation to be estimated:

$$MOB_{ir} = \alpha_0 + \alpha_1 \left(\frac{GDP_i}{GDP_r}\right) + \alpha_2 \left(\frac{POP65_i}{POP65_r}\right) + \alpha_3 \left(\frac{REXP_i^{-1}}{REXP_r^{-1}}\right) + \alpha_4 \left(\frac{BEDS_i}{BEDS_r}\right) + \alpha_5 \left(\frac{HOSP_i}{HOSP_r}\right) + \alpha_6 \left(\frac{INBEDS_i}{INBEDS_r}\right) + \alpha_7 \left(\frac{TURN_i}{TURN_r}\right) + \epsilon_i \quad [1]$$

where: MOB is the net balance between the inflow and outflow of patients; GDP is per capita income, a proxy for the willingness to pay for healthcare services; POP65 is the percentage of population over the age of 65 years, a proxy for healthcare needs. Quality of healthcare provision is proxied by *structural* variables and *outcome* variables. As for structural variables, Levaggi and Zanola consider: the number of beds for 1000 people (BEDS), the number of hospitals for 1000 people (HOSP) and the lagged value of nominal public expenditure in health (REXP). *Outcome* variables include the ratio between the number of inpatients and the number of beds (INBEDS), and an index of turnover (TURN). For notational convenience we have dropped the subscripts t indexing time from [1]. Notice that *i* indexes the focal region and *r* all the regions except the focal. All the variables are detailed in Appendix A.

In the first step of our empirical analysis we replicate the specification [1] over the period 2003-2017, a time span much longer than the one considered by Levaggi and Zanola (i.e. 1994-1997). Table 3 reports our estimation results considering as dependent variable the *escape rate*. As in Levaggi and Zanola, the first column of Table 3 reports pooled OLS estimates. In this first regression, GDP per capita and public expenditure in healthcare are both statistically significant. This significance however disappears as soon as region- and year- fixed effects are introduced (Table 3, columns 2 and 3). When introducing fixed effects, neither the level of GDP per capita level nor public expenditure in healthcare show any effect on mobility.

We find that the number of beds for 1000 people reduces the *escape rate*, whereas no effect is found as far as the index of turnover is considered. The other results are in line with Levaggi and Zanola's. First, we also find that regional age structure has a negative impact on the outflow of patients. Second, we find that increases in the number of hospitals for 1000 people and the ratio between the number of inpatients and the number of beds negatively affect outflows. These estimates are robust to the introduction of controls on the demand side (column 4): *Education*, measured as the share of population made up by people who did not complete primary education; and the *Obesity rate*, which can be interpreted as a measure of the length of time horizon (e.g. Beraldo et al, 2013), hence of the importance that an individual may place on her future health status (Grossman, 1972). We also control for the quality of healthcare provided by the region (column 5), using two variables: *LEA Score*, i.e. a score attributed every year by the Italian Ministry of Health to each region, after an assessment of the adequacy of the basic package of healthcare services regionally provided; *Cesarean rates*, implemented in the region, which can be meant as a measure of inappropriateness of cares (e.g. Francese et al. 2014). All these controls are not statistically significant at the usual levels. Only notice that when LEA scores are introduced, public expenditure in health is found to positively affect patient mobility (column 5). This suggests that given the quality of healthcare provided (captured by LEA scores), increases in current expenditure just turn up in inefficiencies in the management of public resources, what positively affects the outflows of patients. A result consistent with findings by Bordignon et al (2020).

5. The impact of FRPs on Patient mobility

Table 4 reports our main results from the baseline DD analysis aimed at assessing the effect of FRPs on patient mobility. Results come out from estimating the following (standard) equation:

$$MOB_{ir} = \alpha_0 + \alpha_1 FRP_i + \alpha_2 Post_{2007} + \alpha_3 (FRP_i \times Post_{2007}) + \alpha_4 X + \epsilon_i \quad [2]$$

where:

- FRP_i is a time invariant binary variable taking value one for regions exposed to the discipline of the FRP at any given point in time, after 2007;
- $Post_{2007}$ is a dummy variable taking value one in the post treatment period;
- $FRP_i \times Post_{2007}$, is the interaction term; the coefficient on this term is the DD causal effect of interest;
- X is a vector of controls including the variables exhibiting a statistically significant effect on patient mobility when estimating equation [1]; in practice, we use as controls all the variables suggested by Levaggi and Zanola (2004) that proved adequate in explaining patient mobility in our sample.

We also include region and year fixed effects. Robust standard errors, clustered at the regional level, are used in all the specifications. Notice that Bordignon et al (2020) define FRP as a binary variable taking value one only in those years in which a given region has been truly subjected to the FRP. In doing differently, we aim at taking into consideration that in an attempt to avoid any limitation to their prerogatives, highly indebted regions, not yet subjected to FRPs, since 2007 have acted differently from what they would have done had the rules on fiscal discipline not being in force. In other words we posit – providing some evidence of this below - that after its *announcement* in December 2006 this piece of legislation affected the policy choices of those regions running larger fiscal deficits - and then, for this reason, subsequently subjected to FRPs – also when not yet actually subjected to FRPs. In this perspective, we consider as treated any region that after 2007 has been subjected to FRP at some point in time.

Table 4 shows our results. If one excludes column (6), the coefficient associated to the interaction term is highly stable, statistically significant at the usual levels and displays the expected sign. Remarkably, neither FRP_i nor $Post_{2007}$ are statistically significant. This means that neither the differences over the whole period between regions exposed at some point in time to the FRPs' discipline and regions not exposed, nor the time effects capturing temporal changes that are common to all the regions, have any explanatory power. As far as the size of the FRPs on patient mobility is concerned, depending on the estimate, this is found to be in the interval 15-18%. An effect much stronger than the one found by Bordignon et al. (2020). These results, robust to the introduction of controls on the demand side (GDP per capita, POP65, Education and Obesity rate), are wiped out as soon as key supply-side variables, significant in the estimations based on equation (1) are introduced. BED, HOSP and INBEDS display the expected sign and are statistically significant at the usual levels, with the coefficient associated to the interaction term being squeezed to zero by their introduction.

Our estimates rely on the assumption of parallel trends prior to the FRP between treated and control regions. In table 5 we test this assumption parametrically by checking the statistical significance of the interaction term - RP*Year - in a model where the escape rate is regressed on: a linear trend, region and year fixed effects, the interaction term in the sample before the FRP (2003-2006). Table 5 columns 1 shows that the estimated coefficient of the interaction term is small and not statistically significant, suggesting that the parallel trend assumption is not rejected. We also account for anticipated effects of the treatment, estimating a model where the RP dummy is interacted with all the year dummies. Column 2 reports the estimated coefficients of the leads and lags, relative to the first post FRP year (2007, which is omitted). These estimates rule out possible anticipated effects of the FRP in terms of patient escape rate, consistent with the parallel trend assumption. Further, the lack of anticipation effects suggests that any other change in the institutional framework that affected FRP and non-FRP regions differently, did not crucially affected the escape rate patterns. Interestingly the coefficients of the leads are positive, statistically significant and increasing over the post period. This evidence is in line with our interpretation of the DD results: the impact of FRPs on patient mobility is not something that top up the effects caused by variations in the supply side conditions.

In other words, the impact of the FRPs on patient mobility is not, in a sense, autonomous, but works through a modification of the supply side conditions themselves and it is a long-term effect. If one accounts for variations in relevant supply side conditions, the effect of FRPs on patient mobility thus disappears. However, what should be kept in mind is that the effect on supply side conditions is really the main consequence of the fiscal discipline implemented through FRPs. Thus, the effect of FRPs on mobility is of an indirect kind.

Analogous results are found as far as the presence of a commissioner appointed by the Central government to implement the FRP is accounted for. Table 6 shows that results are even stronger - which is in line with the paper by Bordignon et al. (2020) - and suggest an increase in the *escape rate* due to the presence of a commissioner, of about 18-25%. Also, in this case the coefficient associated to the interaction term evaporates as soon as the supply-side variables previously selected are introduced.

Figure 3 shows the evolution of the key supply side variables: BEDS, HOSP, INBEDS. Fig 3(a) compares regions that have been subjected to the discipline of FRP and regions that have not. As one can easily notice, the introduction of FRPs legislation in 2007 has dramatically modified the evolution of these variables.

[Fig 3a near here]

In particular, if one looks at the grey line depicting the counterfactual evolution of these variables in the two groups of regions, immediately realizes how the consequences of the FRP's legislation has been dramatic. One can easily notice a common trend for the evolution of these variables up to 2007, a strong divergence in trends thereafter, with the lines capturing the evolution of BEDS and INBEDS crossing at some point in time. Similar evidence is obtained by comparing (Fig 3b) the group of regions characterized by the presence of a commissioner at some point in time and all the other regions (whether subjected to FRP or not), and the group of regions characterized by the presence of a commissioner at some point in time and all the other regions subjected to FRP at some point in time (Fig 3c) .

[Fig 3b and 3c near here]

Figure 3d looks at the evolution of BEDS, HOSP and INBEDS by groups of regions. Grouping is based on the year in which the FRP was first made active (2007, 2009, 2010). Besides, we also consider regions never subjected to FRP.

[Fig 3d near here]

Figure 3d provides evidence that the mere introduction of FRPs in the Italian legislation affected fiscally undisciplined regions well before they were actually subjected to this form of fiscal discipline. Since 2007 we indeed observe a decrease both in BEDS and HOSP not only in regions whose FRP started in that year, but also in regions that were subjected to FRP only subsequently (2009, 2010). The decrease in HOPS and BEDS over the period 2007-2009 is particularly stark for regions that first implemented a FRP in 2009.

6. Conclusions

In very general terms, looking at society's fundamental goals, it seems that the introduction of FRPs rather than qualifying as a Pareto improvement, re-proposes – in a sense to be specified - the classic equity-efficiency dilemma in an unusual flavour. Indeed, the important results achieved in terms of reduced fiscal deficits, have probably been paired by some undesirable consequences in terms of increasing disparities in the potential access to healthcare.

The striking increase in patient mobility that comes out from our estimates supports the view that policies inspired by cost containment have forced people to move from their regions of residence to get an adequate level of cares. This means an increase in healthcare costs for residents of regions under FRP, hence a reduction of healthcare opportunities (Abatemarco et al. 2020). This also means, however, a potential reduction of opportunities for the citizens of Northern regions, whose healthcare systems have been put under pressure by patient mobility from the South.

Clearly, if fiscal discipline had simply lead to cut inefficiencies in the management of health care resources, its benefits would have come with small acceptable costs in opportunity terms. Substantial patient mobility seems instead a push to conjecture that spending cuts mainly came at the expenses of the structural endowments necessary to provide adequate levels of care, and that inefficiencies in the management of health care resources were only marginally faced by regions. Simply a conjecture, but maybe worth of being investigated in future research.

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Table 1. Variables definition

Variable	Definition	Source
Escape rate	Ratio between passive mobility and total hospitalization of inhabitants	Ministry of Health
Per capita GDP	Regional per-capita GDP	ISTAT, Health for All
POP65	Proportion of the regional population aged 65 and over	ISTAT, Health for All
Obesity rate	Percentage of obese regional population	ISTAT, Health for All
Education	Percentage of population that did not complete primary school	ISTAT, Health for All
REXP	Regional per capita public current expenditure in health	ISTAT, Health for All
BEDS	NHS hospital beds (per 10.000 population)	ISTAT, Health for All
HOSP	Number of hospital and nursing home (per 1.000 population)	ISTAT, Statistiche sanit arie
INBEDS	Ratio of the number of hospitalizations to available beds	ISTAT, Health for All
TURN	Ratio between available hospitalization' days and number of hospitalizations	ISTAT, Health for All
CESAREAN	Ratio between the number of C-sections and the total births (%) in the region considered, over its average in the rest of Italy	ISTAT, Health for All
LEA SCORES	The score measures the adequacy of the basic package of healthcare services provided, attributed every year by the Italian Ministry of Health to each region over its average in the rest of Italy	Ministry of Health

Table 2. Descriptive statistics before and after 2007, by Recovery Plan exposure

	Recovery Plan (RP)				No Recovery Plan (No RP)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Before		**After**		**Before**		**After**	
VARIABLES	Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd
Escape rate	0.0969	0.0469	0.112	0.0571	0.106	0.0680	0.102	0.0604
Per capita GDP	19,994	4,850	21,727	5,526	26,905	4,474	29,137	5,376
PopOver65	19.38	3.243	21.02	2.987	20.74	2.025	22.07	1.842
Obesity rate	10.06	1.528	10.70	1.623	9.553	1.278	10.20	1.297
Education	30.76	5.485	22.83	3.998	30.10	4.881	21.52	3.795
GDP	0.848	0.214	0.850	0.222	1.158	0.199	1.157	0.216
POP65	0.966	0.170	0.975	0.141	1.036	0.106	1.026	0.0819
REXP	0.997	0.104	0.984	0.0789	1.004	0.0873	1.017	0.0780
BEDS	1.038	0.168	0.979	0.132	0.964	0.110	1.023	0.111
HOSP	1.170	0.339	1.121	0.308	0.843	0.331	0.888	0.249
INBEDS	1.039	0.158	1.011	0.114	0.963	0.0953	0.990	0.113
TURN	0.957	0.359	1.009	0.296	1.053	0.287	0.998	0.261
OBESITY RATE	1.029	0.161	1.026	0.163	0.973	0.131	0.976	0.129
EDUCATION	1.012	0.113	1.034	0.154	0.989	0.0944	0.968	0.121
CESAREAN	1.184	0.234	1.190	0.249	0.824	0.211	0.817	0.153
LEA SCORES	-	-	0.895	0.156	-	-	1.135	0.123

Table 3. Determinants of patient mobility

	(1)	(2)	(3)	(4)	(5)
Dep. Variable	Escape rate	Escape rate	Escape rate	Escape rate	Escape rate
GDP	-0.143**	-0.006	-0.007	-0.008	0.007
	(0.058)	(0.039)	(0.041)	(0.042)	(0.033)
Pop>65	0.064	-0.128**	-0.127***	-0.130**	-0.161**
	(0.072)	(0.054)	(0.041)	(0.047)	(0.067)
REXP (lag1)	0.324*	0.012	0.012	0.012	0.037*
	(0.170)	(0.025)	(0.025)	(0.025)	(0.019)
BEDS	-0.122	-0.093***	-0.093***	-0.093***	-0.122***
	(0.081)	(0.018)	(0.017)	(0.016)	(0.014)
HOSP	0.013	-0.017**	-0.017*	-0.017*	-0.012*
	(0.036)	(0.007)	(0.008)	(0.009)	(0.006)
INBEDS	-0.203	-0.128***	-0.127***	-0.126***	-0.081***
	(0.118)	(0.038)	(0.040)	(0.039)	(0.022)
TURN	-0.041	-0.011	-0.011	-0.010	0.003
	(0.051)	(0.008)	(0.009)	(0.009)	(0.005)
EDUCATION				0.006	0.003
				(0.028)	(0.018)
OBESITY RATE				-0.003	-0.002
				(0.006)	(0.005)
LEA SCORES					-0.002
					(0.005)
CESAREAN					0.013
					(0.018)
Constant	0.214	0.476***	0.472***	0.471***	0.426***
	(0.262)	(0.091)	(0.092)	(0.093)	(0.077)
Observations	240	240	240	240	143
Region FE	No	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	Yes
MeanY	0.105	0.105	0.105	0.105	0.107
St.Dev.Y	0.0578	0.0578	0.0578	0.0578	0.0579
Adj R-squared	0.277	0.588	0.616	0.613	0.750
N. Regions		20	20	20	16

Table 4. The effect of Recovery Plan announcement on mobility

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Variable	Escape rate	Escape rate	Escape rate	Escape rate	Escape rate	Escape rate
RP*Post2007	0.019**	0.019**	0.019**	0.017**	0.016**	0.000
	(0.007)	(0.007)	(0.008)	(0.007)	(0.006)	(0.005)
Post2007	-0.004	-0.004				
	(0.004)	(0.004)				
RP	-0.009					
	(0.027)					
GDP				-0.013	-0.014	-0.008
				(0.051)	(0.050)	(0.042)
Pop>65				-0.099	-0.111	-0.130**
				(0.067)	(0.072)	(0.050)
REXP				-0.045	-0.047	0.012
				(0.029)	(0.029)	(0.024)
EDUCATION					0.045	0.006
					(0.052)	(0.027)
OBESITY RATE					-0.004	-0.003
					(0.011)	(0.006)
BEDS						-0.093***
						(0.018)
HOSP						-0.017*
						(0.009)
INBEDS						-0.126***
						(0.040)
TURN						-0.010
						(0.009)
Constant	0.106***	0.101***	0.100***	0.252***	0.228**	0.473***
	(0.022)	(0.003)	(0.003)	(0.079)	(0.084)	(0.093)
Observations	300	300	300	240	240	240
Region FE	No	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	Yes	Yes
Mean	0.106	0.106	0.106	0.105	0.105	0.105
St. Dev.	0.0587	0.0587	0.0587	0.0578	0.0578	0.0578
Number of COD		20	20	20	20	20

Table 5. Common trend and anticipation test

	(1) Parallel-Trend FE	(2) Leads&Lags FE
RP*year	-0.000	
	(0.001)	
RP*year2003		-0.001
		(0.004)
RP*year2004		-0.002
		(0.004)
RP*year2005		-0.002
		(0.003)
RP*year2006		-0.002
		(0.003)
RP*year2008		0.004***
		(0.001)
RP*year2009		0.008**
		(0.003)
RP*year2010		0.009**
		(0.004)
RP*year2011		0.015***
		(0.004)
RP*year2012		0.019***
		(0.005)
RP*year2013		0.023***
		(0.006)
RP*year2014		0.028***
		(0.007)
RP*year2015		0.027***
		(0.007)
RP*year2016		0.031***
		(0.009)
RP*year2017		0.030***
		(0.009)
Observations	80	300
Region FE	YES	YES
Year FE	YES	YES
Mean	0.101	0.101
P-value leads		0.000597

Table 6. The effect of External Commissioner announcement on mobility

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Variable	Escape rate	Escape rate	Escape rate	Escape rate	Escape rate	Escape rate
EC*Post2007	0.026**	0.026**	0.026**	0.021**	0.019**	0.003
	(0.010)	(0.010)	(0.010)	(0.009)	(0.008)	(0.008)
Post2007	-0.001	-0.001				
	(0.004)	(0.004)				
EC	0.024					
	(0.029)					
GDP				-0.014	-0.016	-0.008
				(0.057)	(0.055)	(0.042)
Pop>65				-0.052	-0.070	-0.128**
				(0.074)	(0.078)	(0.048)
REXP				-0.043*	-0.045*	0.013
				(0.023)	(0.024)	(0.024)
EDUCATION					0.048	0.004
					(0.049)	(0.028)
OBESITY RATE					-0.006	-0.003
					(0.011)	(0.006)
BEDS						-0.090***
						(0.017)
HOSP						-0.016*
						(0.008)
INBEDS						-0.126***
						(0.039)
TURN						-0.011
						(0.009)
Constant	0.095***	0.101***	0.100***	0.211**	0.192**	0.468***
	(0.016)	(0.003)	(0.003)	(0.084)	(0.084)	(0.092)
Observations	300	300	300	240	240	240
Region FE	No	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	Yes	Yes
Mean	0.106	0.106	0.106	0.105	0.105	0.105
St. Dev.	0.0587	0.0587	0.0587	0.0578	0.0578	0.0578
N. Regions		20	20	20	20	20

Figure 1. Evolution of the *escape rate* by macro-area (2003-2017)

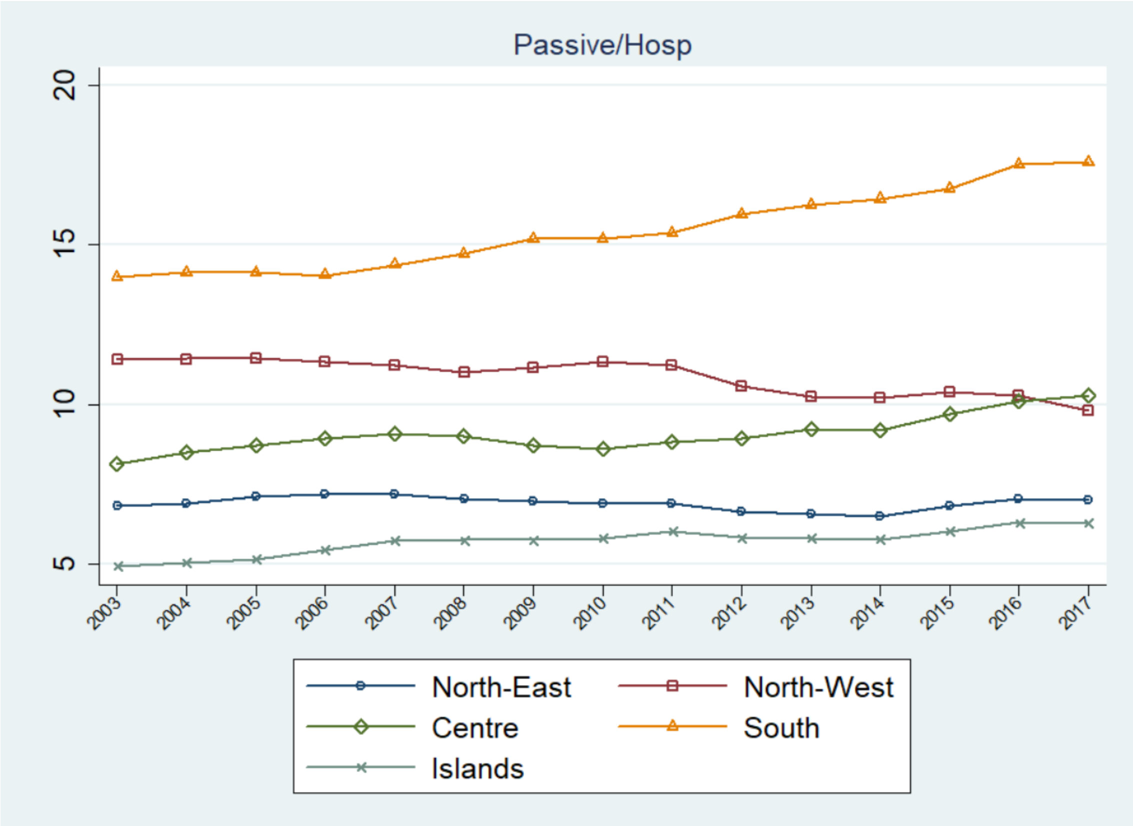
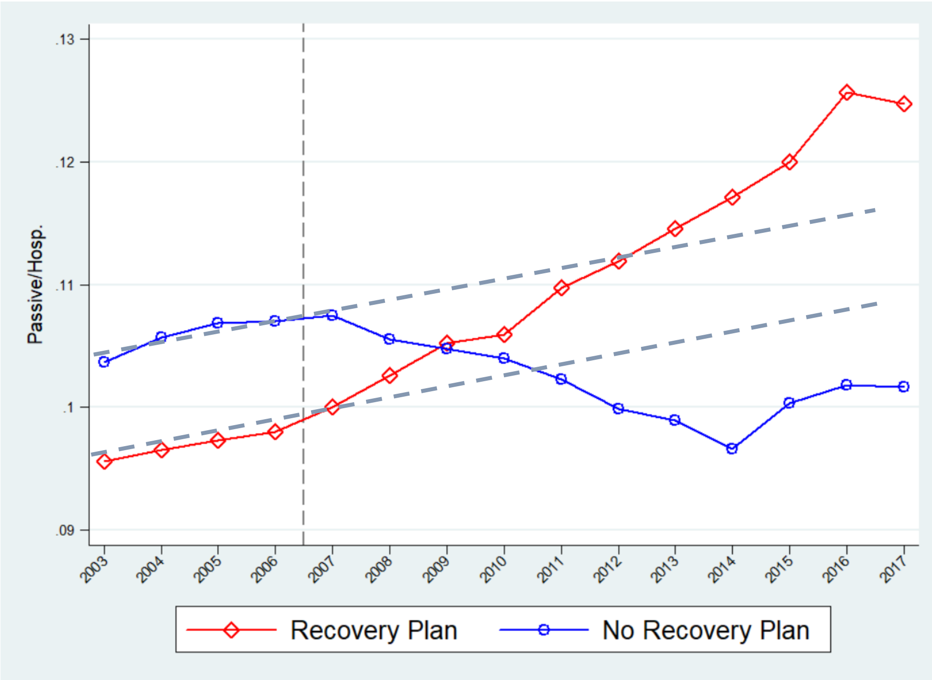


Figure 2. Evolution of the *escape rate*

(a) Comparison between regions that have been subjected to the discipline of FRP at some point in time and regions that have not.



(b) Comparison between regions for whom a commissioner was appointed to ensure compliance at some point in time and regions that have simply subjected – without any commissioner - to the FRP discipline.

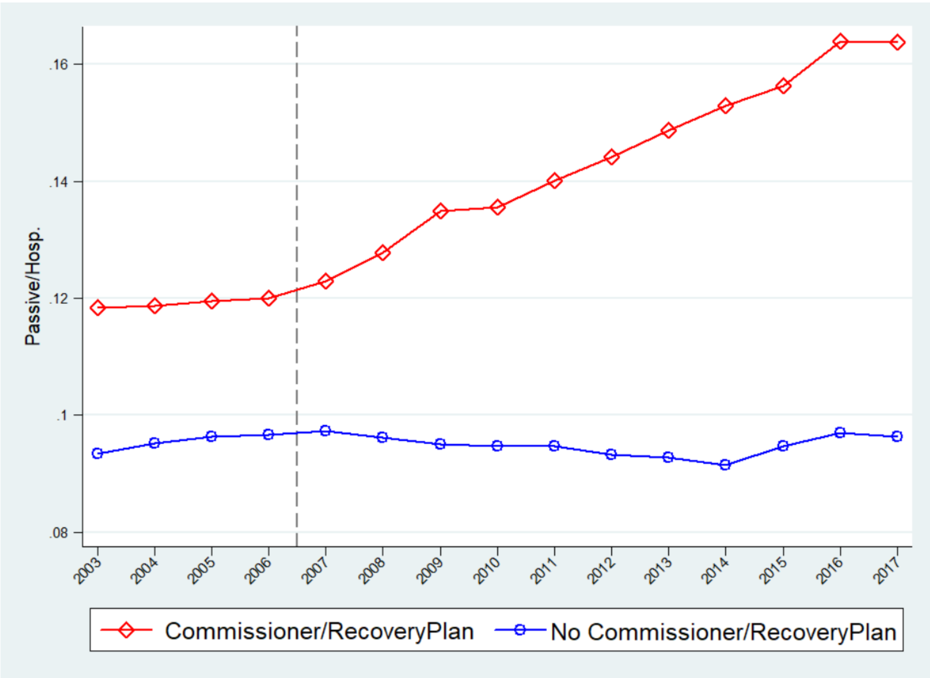
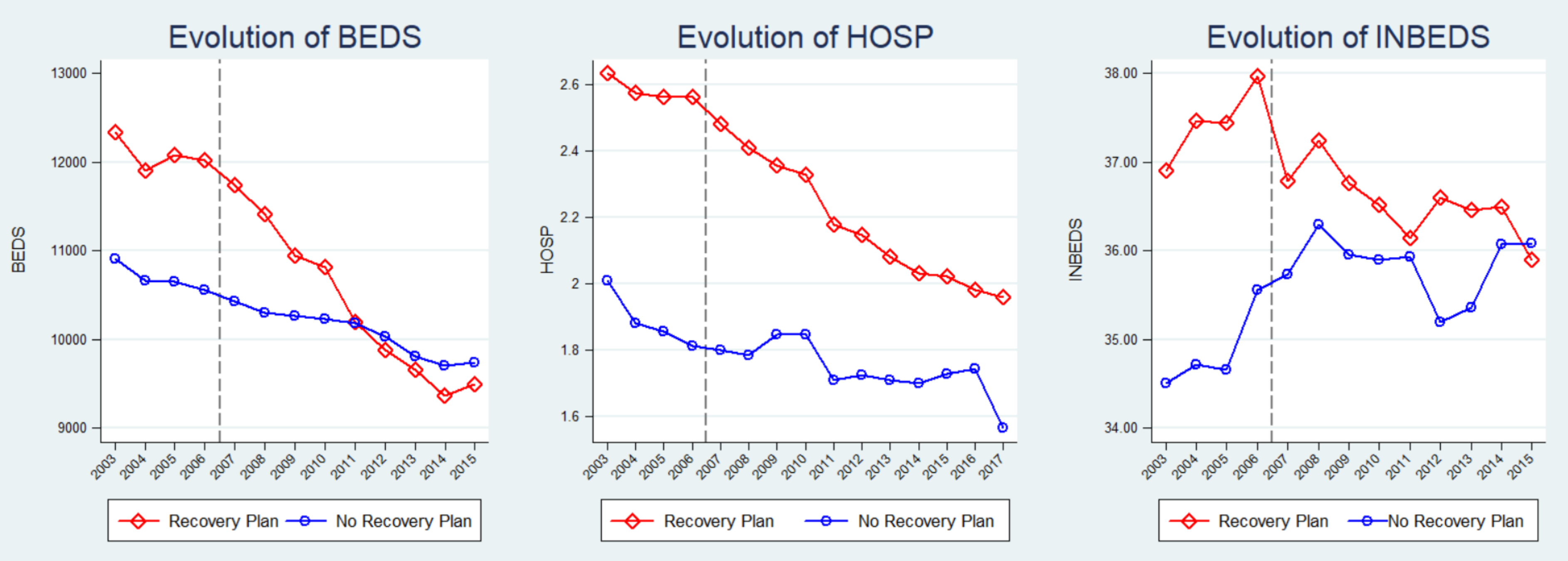
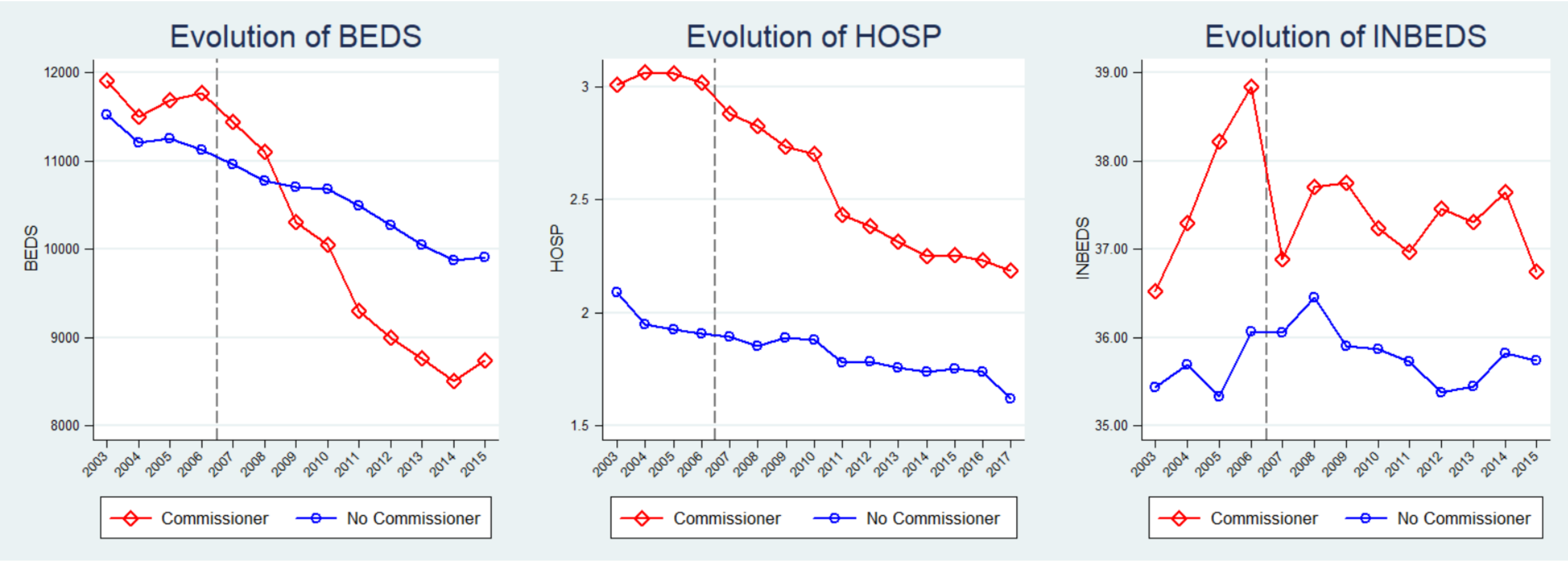


Figure 3. Evolution of key supply side variables: BEDS, HOSP, INBEDS

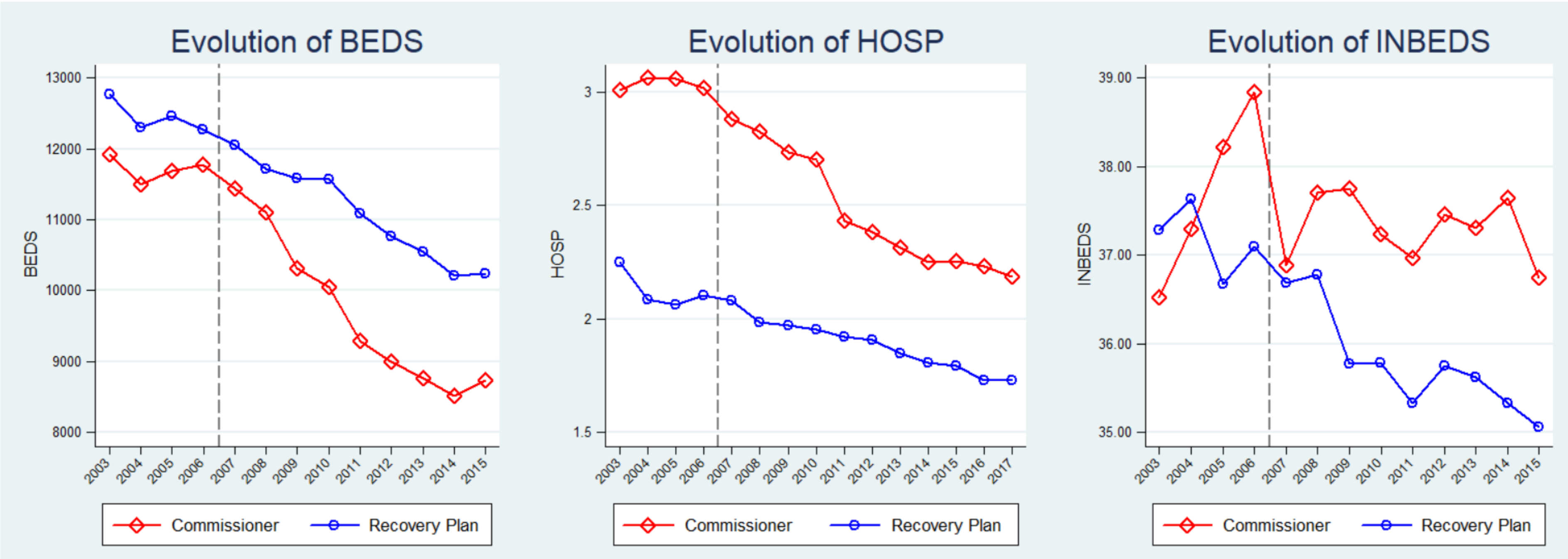
(a) Comparison between regions that have been subjected to the discipline of FRP and regions that have not.



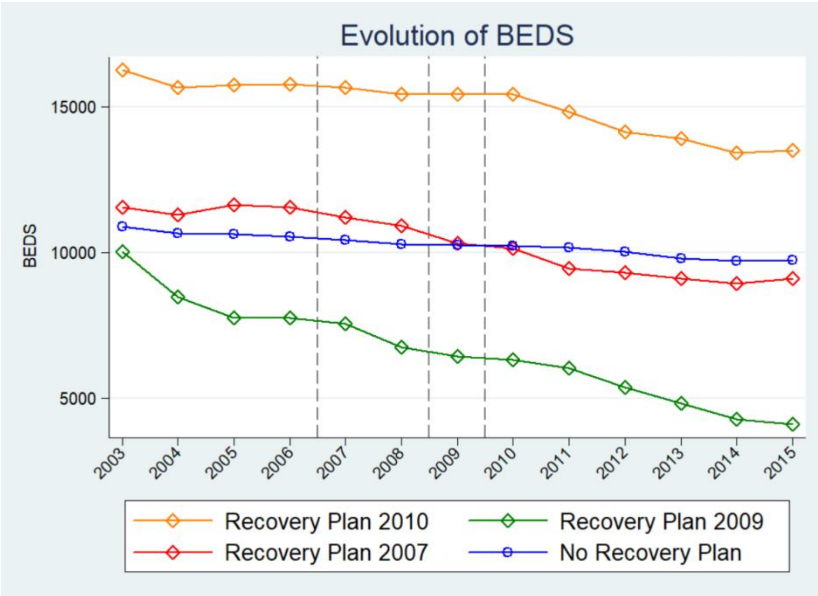
(b) Comparison between regions characterized by the presence of a commissioner at some point in time and all the other regions (whether subjected to FRP or not).

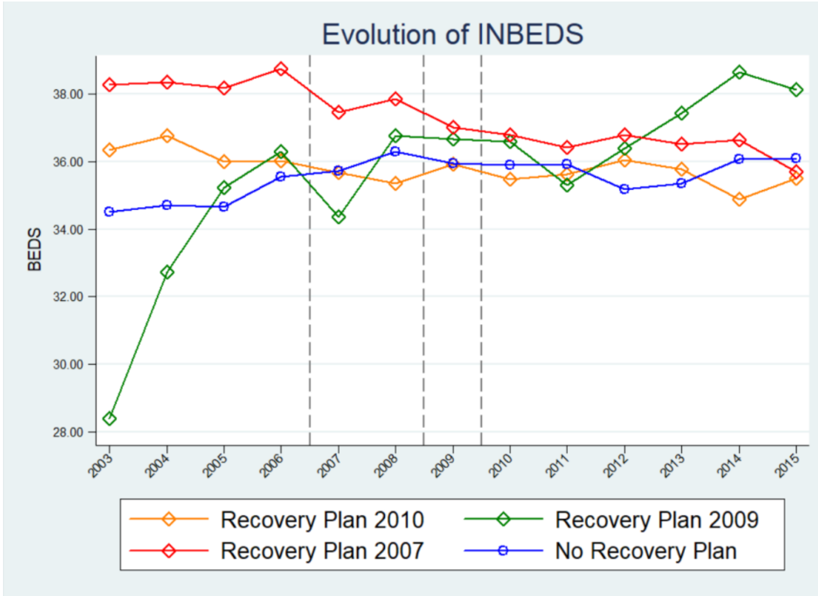


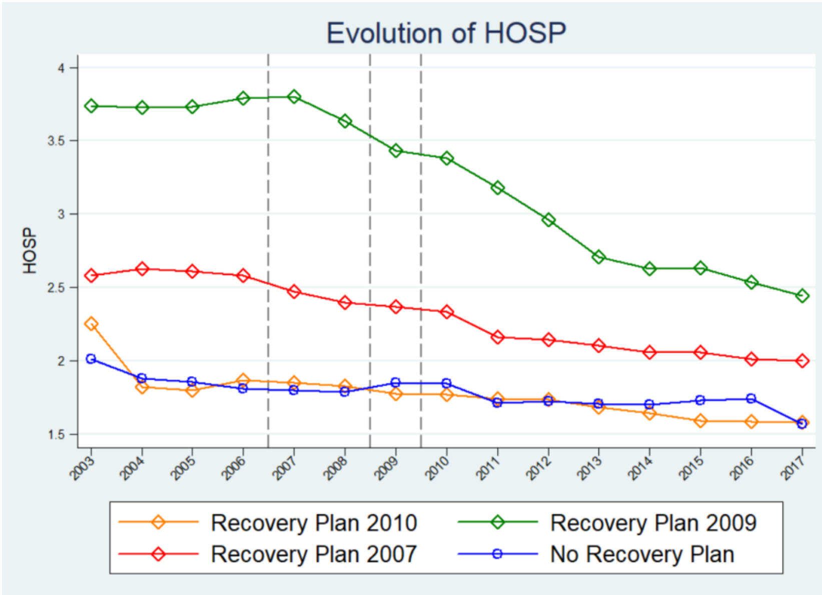
(c) Comparison between regions characterized by the presence of a commissioner at some point in time and all the other regions subjected to FRP at some point in time.



(d)


Evolution of BEDS
BEDS
15000
10000
5000
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Recovery Plan 2010
Recovery Plan 2009
Recovery Plan 2007
No Recovery Plan


Evolution of INBEDS
BEDS
38.00
36.00
34.00
32.00
30.00
28.00
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Recovery Plan 2010
Recovery Plan 2009
Recovery Plan 2007
No Recovery Plan


Evolution of HOSP
HOSP
4
3.5
3
2.5
2
1.5
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Recovery Plan 2010
Recovery Plan 2009
Recovery Plan 2007
No Recovery Plan