THE IMPACT OF POLITICAL VARIABLES ON HEALTH CARE EXPENDITURE AND DEFICITS: THE CASE OF ITALY (1982-2005)

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- Preliminary and incomplete draft -

Abstract
In Italy the central government is largely responsible for financing health-care expenditures, whereas the regions are responsible for spending. This asymmetry has been recognized as a potential cause of the growth of health care expenditures, and the financial interactions between state and regions have been, accordingly, reformed in the last decades. But a number of institutional/political changes likely affecting local public finances also occurred over the same period. The case of Italy, thus, offers a convenient laboratory-like testing to assess the effects of political factors on health care expenditure. On the basis of a unique data set containing all the regional health-care structural and economic variables, as well as the basic institutional/political variables of all the Italian regions from 1982 to 2005, we analyse the determinants on health expenditure and deficits. The structural factors result not to be the only significant determinants, political factors and institutions also affect the trend of health care expenditures and deficits, not necessarily in the expected direction.

Keywords: health care expenditure; federalism; political factors

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1. Introduction

In the last three decades the growing trend of health care expenditure in industrialized countries has been largely explored; and the need for reform in public health care management and financing has been on the top of the political agenda. This trend has been explained with two main groups of theories. Those general theories explaining the growth of total public expenditure, *per se*, as a common feature of the industrialized democracies[1] and those explaining the peculiarity of the growth of the health care expenditure as depending on physiological and economic-institutional features of the industrialised countries such as, say, the ageing population, health care costs and charges, inefficient supply of health care services, consumers' demand for high quality services, and, more recently, the degree of federalism/centralisation of the country.[2]

In either group of theories, political and institutional elements clearly emerge as determinants (principal or secondary) of the public expenditures (in general and, in particular, on health). These elements, in the most recent (empirical and theoretical) literature have become those more frequently studied, with different approaches. For example, the debate related to public expenditure growth recently compares the dynamics and the compositions of the government expenditure among the countries with proportional *vs.* plurality voting system (Persson and Tabellini, 1999; 2000; 2001). This attitude has been recently imported into the empirical analyses of the health care expenditures in Switzerland. For example, Crivelli et al. (2004) apply the determinants approach to the Swiss cantons considering among the independent variables the cantonal index for direct democracy by Trechsel and Serdult (1999) and Frey and Stutzer (2000); a further comparative study (Vatter and Ruefli, 2003) of swiss cantons has investigated the role of specific political factors on health care expenditure.

In this paper we want to explore whether an analogous role has been also played by political and institutional factors on the choices related to the health care system in Italy. For it, we test - on deficit

[1] Franco (1993) gathers the theories interpreting the expenditure growth in two principal seams. The first includes conflicting-type explanations, according to which the growth of public expenditures depends on the contrasts among the subjects that compose the society and on the institutions of the country. In particular, the growth of public expenditures in Italy is connected to economic crises and social conflicts that, between the end of the '70s and the beginning of the '80s, required public interventions in order to support the productive and redistributive system. In these years the political (and economic) authorities have managed expenditures in order to recompose social conflicts, without threatening their own electoral consent. The second seam includes those theories of "structural" or "functional" type according to which the expenditure growth is inevitable, being determined by changes of the economic and social structure. A first relevant paradigm is the so called "Wagner law" according to which the economic and social progress imply an increase of government expenditure proportional to the national product. The second paradigm is the so-called "Tocqueville law", according to which the growth of the government expenditure with respect to GDP depends on the expansion of the electoral body and on the unequal distribution of income, implying the widening of the suffrage to the poorest to a most uneven distribution of income of the voters.

[2] A body of empirical literature examining the determinants of health expenditures has been recently developed. Most studies have estimated the relation between per-capita health care expenditure and its determinants, namely: the proportion of population over 65 and under 5, per-capita GDP, the public finance share of health care spending, urbanization, and the number of practising physicians per capita.

The first generation of studies at the international level has focused mainly on the estimation of the elasticity of health care expenditures with respect to per-capita GDP. In this vein Newhouse (1977), Leu (1986), Gerdtham et al. (1992). The second generation of studies use panel sample of OECD countries, combining cross-country and time-series data, (see

and expenditures - not only the role of the standard structural determinants of health care (such as, per capita GDP; demographic factors; number of practitioners, number of public and private hospitals) which might be relevant for a traditional cross-region analysis. We also keep into consideration the institutional changes and the political features that characterize Italian regions in the period considered. In this respect, the case of Italy offers a convenient laboratory-like testing to assess the effects of political factors on health care expenditure: on the one side, the control of health expenditures over the last twenty years has been a crucial political issue and a mixed set of instruments has been put forward, with the Italian regions gradually charged of partial financial responsibility of health care expenditures; on the other side, the regional electoral system changed from proportional to mixed plurality in 1994 and, in 1999, the direct election of the president of the region, who becomes formally and fully responsible of regional administration was introduced.

On the basis of a unique data set containing all the regional health-care data and economic variables of all the Italian regions from 1982 to 2005 - a period characterized by growing health deficits and the introduction of different control policies and political/institutional innovation - we empirically study the (per-capita) health care deficits and expenditures in the Italian regions keeping into consideration both the structural determinants of health expenditures and the impact of political and institutional factors on the public choices affecting the Italian health-care system. We show that political and institutional variables have indeed affected the regions health care expenditure and deficits: and specifically regional political responsibility, paralleled with partial financial responsibility, appears unable to control health care expenditures and deficits.

The paper is structured as follows. In section 2 we present some stylized facts on the Italian health care expenditures and deficits as related to the main features of the Italian health care system, and the main institutional and political factors (such as the impact of federalism, the political differences among regions, and the recent changes of the electoral system for the election of the regional governments occurred in 1995 up to the direct election of the president of the region in 1999) that might have affected the health care policies in the period considered. Sections 3 presents the model and the empirical results based on the regional panel data set. Conclusions follow in section 4.

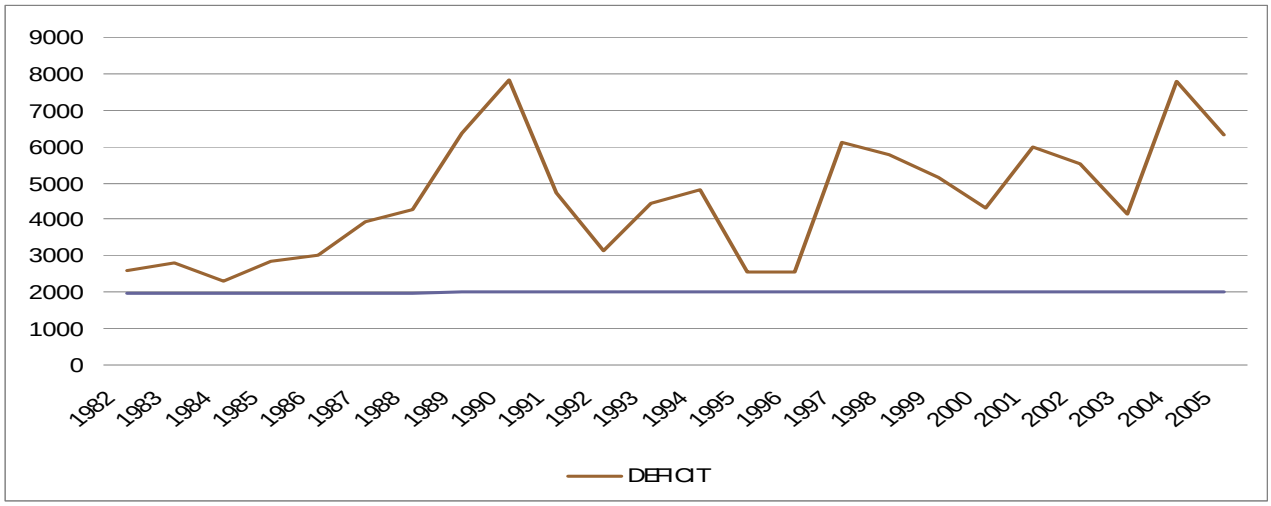
2. Some stylised facts: the Italian health care system and expenditure (1982-2005)

The Italian National Health Service NHS (or Servizio Sanitario Nazionale, SSN), founded in 1978, is a universal health care system providing comprehensive health insurance coverage and uniform health benefits to the whole population, subject to user charges for certain services. The system, now organized on the three level governments (national, regional, and municipal), was

Hitiris and Posnett (1992) Gerdtham et al. (1998) Barros (1998) Di Matteo and Di Matteo (1998) Crivelli, Filippini and Mosca (2003), Crivelli et al. (2004)).

originally highly centralized.[3] Since 1978, the amount of funds (coming from general taxation, payrolls and compulsory social security contributions for health) financing the NHS was determined by the central government that should have also addressed the health care expenditure occuring on a regional basis. The separation of revenue raising responsibilities from expenditure responsibilities of the regional governments, during the 1980's, is considered the reason of the continuous increases of the Italian health care expenditures, with the regions regularly running the budget deficits and determining large hidden regional debts, subsequently repaid by the state.

Figure 1. The Italian health care deficits (mln euros)



In particular, from 1982 to the beginning of the 90's, public health care deficit was growing out of control; then deficits were faced with a mixed and confused set of policies with an apparent immediate positive result. In 1997, however, the Italian regions showed again remarkable health care deficits, with the trend slightly decreasing until 2001, followed by an up-and-down course, with a further negative result in 2004. The behaviour of the health care deficits clearly emerges in Figure 1.

An explanation of the failure of deficit control policies has been found in bailing out expectations of regions, that is, the expectations of central governement's intervention in the (ex-post) financing of past deficts (Bordignon and Turati, 2003). This view implies that with the financial responsibility (although partially) given to regions, health care expenditure and deficits growth should not be (fully) out of control. Nevertheless, health care deficits apparently follows the path of the evolution of the central government financing and even with the financial responsibility progressively, but only partially, given to regions, the latter have never improved their expenditure behaviour as

[3] An attempt for decentralization begun in the first half of the 90s', but it was only in 1997 that an increasingly extended regionalization and a strengthened role of municipalities became a remarkable feature of the Italian health care system.

related to the allocated resources. Indeed, health care expenditures grow in all regions, in percentage of GDP, from 1982 to 2005 (see table 1), even doubling somewhere.

Table 1. Health care expenditure in the Italian region- over GNP %

	1982	1987	1992	1997	2005	2005/1982
Piemonte	4,11	4,43	6,73	6,58	8,24	4,13
Valle d Aosta	2,95	3,63	5,33	6,61	7,33	4,38
Lombardia	3,82	3,92	6,03	5,8	6,6	2,78
Trentino Alto Adige	4,12	4,16	6,12	6,36	7,67	3,55
Veneto	4,95	5,09	7	6,67	7,17	2,22
Friuli Venezia Giulia	6,22	6,25	7,63	7,12	8,13	1,91
Liguria	6,07	5,94	8,81	8,15	9,45	3,38
Emilia Romagna	4,43	4,89	7,53	6,72	7,48	3,05
Toscana	4,98	5,42	7,54	7,13	7,82	2,84
Umbria	5,01	5,80	7,97	7,59	8,63	3,62
Marche	5,61	6,08	8,87	7,53	8,07	2,46
Lazio	5,69	5,15	7,31	7,17	8,45	2,76
Abruzzo	6,05	6,19	8,04	8,16	10,16	4,11
Molise	6,14	6,80	9,34	8,51	13,47	7,33
Campania	6,34	7,74	10,68	10,43	12,71	6,37
Puglia	7,56	7,56	10,65	10,17	11,63	4,07
Basilicata	6,39	7,52	9,7	8,59	10,5	4,11
Calabria	8,11	8,83	11,14	10,81	11,8	3,69
Sicilia	6,42	7,55	9,71	8,65	11,78	5,36
Sardegna	4,39	6,88	9,64	8,93	10,27	5,88
Italy	6,7	7,7	8,0	7,7	8,9	2,20

Source: Istat

This has led to periodic attempts of reforming the NHS financing mechanisms, which remains public and centrally managed, although at a decreasing rate (from 80.5% in 1980, to 72.6% in 2000). In particular, the evolution of the health care financing system can be summarized in the following four periods.

1982-1992: The state directly allocated grants to local health authorities, regionally based and in charge of the provision of health care services. Bailing out expectations from regions were always fulfilled by the state;

1993-1997: The regions are responsible for financing additional health services. The 1992/93 NHS reform (Legislative Decrees n. 502/92 and 517/93) stated that regions, incurring budget deficits, could rely on payroll contributions, previously collected by the central government, earmarked for health care. Regions were also allowed to raise contribution rates. These options, however, were never taken by regions. The 1990's bail out of the regional health care deficits continued to affect NHS funding.

1998-2000: The NHS is partially financed by regions, with introduction of a value added- type tax on firms (called IRAP, e.g. regional tax on productive activities) and a regional surtax on the personal income together with intergovernmental grants;[4]

2001-2005: The intergovernmental grants are replaced with revenue sharing on the value added tax (VAT). The fiscal reform affecting the financing of the NHS (Legislative Decree n.56/00), stated that, starting from 2001, health care funding would become a regional responsibility. However, this was only an accounting statement, because the regional responsibility for the allocation of the resources has never been fully applied.

This process of change in the health care public financing mechanisms has been accompanied by important political and institutional changes: the passage from proportional to a mixed plurality electoral system in 1995 for the regions with ordinary bylaw, followed in 1999 by the direct election of the president of the region, who becomes directly responsible of the regional choices, including health care management. These institutional factors can explain some of the observed trend of the Italian health care expenditures and deficits.

3. Empirical investigation and results

The econometric analysis investigates the determinants of regional discretionary choices related to health care deficits and expenditures of the Italian regions in the period 1982-2005. We take into consideration three sets of variables:

a) structural, socio-economic and demographic characteristics (such as regional structural data on the health care sector, regional GDP, population and ageing population, mortality and infant mortality rates). In particular, given the dependent variables (per capita regional health care deficit and expenditures at 2005 prices) we test the impact of ageing population (the proportion of people aged 65 or more in each region); the number of public hospital beds (per 1000 pop.); the density of hospital doctors and general practitioners (GP) per 1000 pop.; the mortality rates and infant mortality rates at regional level; the per capita regional GDP at 2005 prices.

b) three variables capture the homogeneous periods of central government policies for health-care public finances: they are the dummy_82_92, dummy_93-97 (respectively, for the fiscal reforms of the periods 1982-1992 and 1993-1997) and dummy_98_05 (capturing the fiscal reforms of

[4] The first 1997 fiscal reform, aimed both at eliminating disparities in payroll tax contributions rates, and at introducing fiscal decentralisation (Leg. Decree n.446/1997). The 1999 SSN reform had introduced the definition of essential and uniform assistance levels (LEAs), the essential benefit package covering all medical care defined as necessary, appropriate and cost-effective. The reform stated that LEAs should be defined contextually to their financing, namely the capitation rate of public spending granted to each citizen. Responsibilities for ensuring the general objectives and fundamental principles of the system are maintained on the national level. The regional health authorities are responsible for ensuring the delivery LEAs. This is accomplished through a network of local health management units (ASL - Aziende Sanitarie Locali), public and accredited private health care providers (Donatini et al. 1999). Regions have to rely on regional taxes for funding both health care and other regionally-funded activities.

the periods 1998-2000 and 2001-2005, all together because they are actually in the same direction).

c) We finally defined and tested a set of political and institutional dummies as follows: (i) the type of electoral system under which the regional government was elected is considered by means of regional dummy variables taking on value of 0 under the proportional system and value equal to 1 under the plurality system. Moreover the test has been done for all types (colours) of regional ruling coalitions. In Italy, a first political divide can be found between the group of regions of the centre of Italy, traditionally left-wing (Tuscany, Umbria and Emilia Romagna) in either electoral period and the majority of the regions run by the democratic Christian party in the proportional period becoming right-wing in the mixed plurality one. There is also a small group of regions (Friuli Venezia Giulia, Val d'Aosta and for one term also Veneto) traditionally run by the so called "autonomous-local" parties and a further small group of politically switching regions, which have been left or right wing for a term and have changed in the subsequent one. Thus, a set of variables combining the ruling party and the electoral system (proportional or plurality electoral system) over time are build capturing the following features: in the period of proportional electoral system, we distinguish the regional governments ruled by either Democratic Christian party, Communist party alone and with the Socialist party, centre left coalition (with Democratic Christian party), or Local Authonomies (i.e., Union Valdotain, Lega Lombarda and SVP in Trentino Alto Adige); during the period of plurality electoral system the regional government coalitions are separated into two main groups, i.e., the centre-right and the centre-left ruling coalitions. (ii) Changes in the electoral law related to the election of the president of the region: the dummy *president_elec* takes on value 1 since the year of direct election of the president of the region (this means that for regions with ordinary bylaw, the variable takes on value 0 up to 1998; in the regions with straordinary bylaw, the variable takes on value 0 up to 2000). (iii) Political and local elections are captured by the variable *elez* that takes on value 1 for the years of general political election and/or local elections and 0 otherwise.

The dataset is a yearly panel data for the 20 Italian regions for the period 1982-2005. Main variables used and summary statistics are reported in table 2.

Table 2. Summary statistics of the considered variables

VARIABLE		OBS	MEAN	STD.DEV.	MIN	MAX
Trend	Linear time trend	480	1993.5	6.929	1982	2005
AGE=pop_over65	People over 65 (% of population)	480	16.537	3.741	8.91	26.52
Pop	Regional population	480	2844780	2234619	112262	9393092
Elez	Dummy =1 for Political and/or Regional Election Year, 0 otherwise	480	0.4396	0.497	0	1
Right_gov	Dummy=1 for right-wing regional ruling coalition (since 1995)	480	0.202	0.402	0	1
Left_gov	Dummy=1 for left-wing regional ruling coalition (since 1995)	480	0.285	0.452	0	1
Red_gov_94	Dummy=1 for traditional regional "Red" ruling coalitions up to 1994, with regional "Red" ruling coalitions made up by the following parties: PCI alone, PCI and PSI	480	0.115	0.319	0	1
Reg_stat_spe	Dummy=1 for those regions with special Bylaw	480	0.25	0.433	0	1
Electoral_law	Dummy= 0 under the proportional system and equal to 1 under the plurality system (regions with special Bylaw included)	480	0.427	0.495	0	1
president_elec	For the changes in the electoral law related to the election of the president of the region, the dummy takes on value 1 since the direct election of the president of the region (this means that in regions with ordinary bylaw it takes on value 0 up to 1998; in regions with straordinary bylaw it takes on value 0 up to 2000).	480	0.271	0.445	0	1
t_mort	Mortality rate for 1000 inhabitants.	480	99.217	15.463	71.70	144.73
t_mort_inf	Infant mortality rate for 1000 children born in the same year	480	66.756	27.844	17.58	151.414
pc_H_expenditure	Per capita regional health care expenditure at 2005 prices	480	738.349	693.579	44.679	5918.736
pc_H_deficit	Per capita regional health care deficit at 2005 prices	480	0.0488	0.076	-0.468	0.620
pc_GDP	Per capita regional GDP at 2005 prices	480	12212.52	12784.15	772.6	107041.6
GP	Number of general pratictioners per 1000 inhabitants	480	0.893	0.477	0.228	3.915
Tot_H_doctors	Number of Hospital (private and public) doctors per 1000 inhabitants	480	1.729	1.043	0.32	8.56
BEDS	number of public hospital beds per 1000 inhabitants	480	6.7992	4.138	1.279	38.813
N.HOSP	Number of public and private hospitals per 1000 inhabitants	480	0.032	0.035	0.0034	0.6999
dummy_82_92	Dummy=1 for the years 1982-1992, =0 otherwise	480	0.458	0.499	0	1
dummy_93_97	Dummy=1 for the years 1993-1997, =0 otherwise	480	0.208	0.406	0	1
dummy_98_05	Dummy=1 for the years 1998-2005, =0 otherwise	480	0.333	0.472	0	1

We first consider regional per capita health care deficit at constant prices 2005. Results are reported in table 3. Notice that, for the sake of simplicity, here the health care deficit - usually such if the difference between revenues and expenditures is lower than zero - has been multiplied by (-1). That is, the health care surplus here takes on negative values, whereas the health care deficit positive. The per capita deficit is, significatively, positively explained by the time trend. The per capita GDP at constant 2005 prices is also significant with negative sign, this, joint with the squared per capita GDP at constant 2005 prices significant and with positive sign, means that with respect to GDP the deficit follows a U-shape (K≅0): then the increase of GDP increase the deficit. The percapita deficit is also significantly affected by the mortality rate, by the index of ageing population and by number of beds, which both take positive sign. The variable red_gov_94 is also significant with positive sign; the dummy_82_92 is also significant with positive sign, whereas, the dummy capturing the policies from

1998-2005 is not significant. Finally notice that the percapita deficit is inversely related with the electoral year.

Table 3. Panel estimates of the determinants of the per capita health care deficit (constant prices 2005)

Dependent variable: pc_H_deficit **Fixed-effects (within) regression** **Number of obs = 480** **Group variable (i): cod_reg** **Number of groups=20** **R-sq: within = 0.17178** **Obs per group: min=24** **between= 0.0217** **avg=24** **overall = 0.023** **max=24** **F(15,445)= 6.15** **corr(u_i, Xb) = -0.8196** **Prob > F = 0**			
	Coef.	**Std.Err.**	**t**
Trend	0.0080264	0.003105	2.59
pc_GDP	-5.84E-06	2.33E-06	-2.51
squared pc_GDP	5.84E-11	1.73E-11	3.37
t_mort	0.0189669	0.010278	1.85
t_mort_inf	-0.0023243	0.002989	-0.78
AGE=pop_over651	0.0081872	0.004204	1.95
GP	-0.0173428	0.024084	-0.72
Tot_H_doctors	-0.0004213	0.014657	-0.03
BEDS	0.0077593	0.003532	2.2
Red_gov_94	0.0418004	0.017408	2.4
Left_gov	0.0085893	0.010992	0.78
dummy_82_92	0.0457716	0.014315	3.2
dummy_98_05	-0.0181872	0.015651	-1.16
elez	-0.0139247	0.006545	-2.13
president_elec	0.0047543	0.015326	0.31
C	0.0314356	0.009796	3.21
sigma_u	0.063878		
sigma_e	0.068432		
rho	0.465619	(fraction of variance due to u_i)	
F test that all u_i=0: F(19, 445) =3.06 **Prob > F = 0.0** **Hausman Test:** chi2(13) = 44.7 Prob>chi2 = 0.0			

As for regional per capita health care expenditures at constant prices 2005, the results are reported in table 4. It basically shows that the expenditures' policies are partially disjoint from the revenues policies as captured by the deficit estimates.

Notice first that, as well as pc_H_deficit, also pc_H_expenditure has been tested for unit root (results are available from authors on request). The test here suggested the inclusion among the regressors of the lagged value of the dependent variable, which is significant and takes on positive sign. The per capita expenditures is also significatively, positively explained by the time trend (37.8 euros per year). The mortality rate is significant and affects the percapita expenditures with negative sign (recall that we have changed the sign to the deficit in the previous estimate), whereas the index of ageing population is not longer significant. The hospital doctors are significant and take positive sign, moreover they explains most of the percapita expenditure for health. The number of beds is not

significant. The dummy capturing those regions ruled at a local level by a centre left government coalition after 1994 is significant, with negative sign; whereas the variable red-gov_94 is not significant now. The electoral year does not affect expenditures; and policies are only significant, with positive sign, for the period 1982-1992. Finally, the institutional change introducing the direct election of the region president is significant with positive sign.

Table 4. Panel estimates of determinants of per capita health care expenditure (constant prices 2005)

Dependent variable: pc_H_expenditure			
Fixed-effects (within) regression			
Number of obs=460			
Group variable (i): cod_reg Number of groups=20			
R-sq: within = 0.9504 Obs per group:min=23			
between = 0.9434 avg = 23			
overall = 0.9483 max = 23			
F(14,426) = 583.56 corr(u_i, Xb) = 583.56			
Prob > F=0			
	Coef.	**Std.Err.**	**t**
pc_H_expenditure (-1)	0.3208	0.0234982	13.65
Trend	38.57	5.59173	6.9
t_mort	-41.53	21.61473	-1.92
t_mort_inf	2.6869	6.620111	0.41
AGE=pop_over65	-1.32	9.214845	-0.14
GP	285.41	49.96912	5.71
Tot_H_doctors	231.08	29.07394	7.95
BEDS	-5.751	6.657538	-0.86
Red_gov_94	-22.17	34.72588	-0.64
Left_gov	-51.06	23.07363	-2.21
dummy_82_92	50.958	30.31497	1.68
dummy_98_05	17.664	32.69226	0.54
Elez	6.7286	13.82831	0.49
president_elec	125.78	32.36017	3.89
C	707.58	20.38234	34.72
Sigma_u	81.222		
Sigma_e	141.89		
Rho	0.2468	(fraction of variance due to u_i)	
F Test that all u_i=0: F(19, 426) =1.96			
Prob > F = 0.0094			
Hausman Test: chi2(13) = 28.68			
Prob>chi2 = 0.0073			

4. Concluding remarks

The control of health care expenditures and deficits has been at top of italian political agenda over the last decade. However, the wished result has not been reached. The nature of this failure is twofold: it concerns the side of the implemented policies and the side of the political reforms occurred during the period analysed in the present paper.

Our findings suggest that structural factors are not the only determinants of health expenditures. It turns out that political factors affect the trend of expenditures and deficits, but not in the direction expected by the political reforms that introduced (a partial) financial responsibility of regions by means of plurality voting system and direct election of the president in italian regions. Moreover, the central policies aiming at controlling health expenditures and deficits were not effective, as expected, possibly because the financial responsibility of the regions is only partial, given the expectations of bailing out from central governement. In particular, the change of electoral system and the direct election of the president of the regions have not given the expected responsibility of political decisions and control on health expenditures and deficits: specifically, the direct election of the president of the region positively affected health expenditure, and the deficit reduces in the electoral years: it could be considered a political stigma, whereas high expenditures are not. Further, and confirming partisan theory (Hibbs, 1977; Hichs and Swank, 1992), left regional governements (up to 1994) positively affect the deficits. Nevertheless; almost the same regions, after 1994, that is after getting the responsibility of financing health expenditure, appear to be able to control the trend of health expenditures.

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