Social Capital and Patients Mobility in Italy

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ABSTRACT

In several health care systems free patient mobility for hospital care has been encouraged in order to stimulate competition. We analyse the determinants of regional passive mobility in Italy within a panel data framework, considering also spatial effects, over the period 2006-2015. We argue that local social capital may be important, because in the health care market information asymmetries are relevant. Our results indicate that Italian regional patient mobility is explained by the permanence of relevant differences in quality between regional health services but also that a stronger cooperative behaviour reflecting trust in the regional environment helps discouraging mobility.

Keywords: inter-regional patient mobility, social capital, decentralised health systems, spatial spillovers

JEL: I10, Z13, C23,

Introduction

Since the 2001 reform, the Italian national health care system is regionally decentralised and patients may freely choose where to be cured. Decentralisation was aimed at stimulating competition among local health care systems in line with the economic literature suggesting that free patient choice in the long run should foster quality levelling (Brekke et al. 2012, 2014). In order to test the effectiveness of this policy, the attention of recent literature (Balia et al. 2014, 2018) has been focussed on investigating to what extent patient mobility is driven by factors related to policies pursued by regional health authorities and to what extent it is motivated by exogenous factors.

Among the determinants of patient mobility, in most recent studies we find "health structure variables" (beds, performance indexes, quality indexes, technology indexes, etc.), that are more or less under the control of regional health authorities, and "exogenous variables", not directly controlled by policy makers (demographic, economic and geographic variables). We argue that local "social capital variables" may also be of some importance, because in the health care market information asymmetries are relevant and therefore "trust" is a crucial element in determining patients' choice. What may be significant for patients, in making their choice regarding where to be cured, are variables familiar with them which can influence directly their perception of a good and friendly health care environment, rather than the magnitude of health system characteristics that are often not known to them.

The motivations for patient migration can be separated into push and pull factors (Gan & Frederick, 2011). Push factors relate to the characteristics of the origin region inducing patients to leave while pull factors are related to the characteristics of the destination region attracting patients from outside. The aim of our analysis is to show how factors such as the lack of trust in the environment /contextual setting where they live may affect patients' choice to migrate for health reasons, i.e. may represent a push factor.

In this perspective, Italy is an interesting case study. First of all, since 2001 Italy is a regionally decentralised tax-funded system in which patients are entitled to choose any provider of hospital care from anywhere in the country and where, therefore, inter–regional patient mobility is a relevant phenomenon. In addition, Italy is the country where sociologists first studied the effects of trust and social capital on efficiency. Putnam, Leonardi and Nanetti (1993) in their seminal work found that Italian regions' social capital was an important cultural and social structural factor affecting economic growth.

Based on a ten year (2006-2015) regional Italian dataset on hospital discharge, we examine the determinants of the regional escape index (i.e. passive mobility ratio), given by the percentage of residents hospitalized in other regions with respect to the total number of residents in a given region admitted to hospital during the year (both in and outside the region of origin). We estimate an econometric model including among explanatory variables a large number of "push factors" proxies. In addition to demographic and economic factors affecting demand for health care services in general (such as population age and per capita income) and local supply factors (like hospital beds, technology endowments and performance indicators) already found in the literature, we estimate the effect of some variables proxying local social capital. Estimation results highlight the significant impact of social capital on patients' migration. Moreover, in order to control for the "pull effect" of these variables, we apply a simple spatial econometric model, SLX model (Le Sage & Pace, 2009) where the same explanatory variables exploited in the previous model are spatially weighted. By exploiting this SLX model, we detect what we call 'neighbour effect', i.e. the impact of the presence of other attractive regional health care systems, that is assumed to be stronger the closer they are and, therefore, the less costly is to reach them.

We focus on the concept of social capital proposed by Putnam et al. (1993) based on three dimensions of social capital: interpersonal trust, active participation in public affairs and generalized expectations of cooperative behaviour. The proxies used to measure the three dimensions of social capital for Italian regions are the quality of friendship relationships (for the "interpersonal trust" dimension), the involvement in social activities (for the active participation dimension) and the number of blood donors (for the generalized cooperative behaviour).

This study offers a valuable contribution to the ongoing debate on the effectiveness of patients' empowerment through free mobility as a tool stimulating competition among regional health care systems and convergence in their quality. Data show that, in Italy, since the 2001 reform, creating 21 autonomous regional health services where patients may freely choose where to be cured, interregional patient mobility remained high. Our results confirm that this phenomenon is motivated by the permanence of relevant differences in quality between regional health services but suggest that it may be also explained by a significant push effect of local social capital.

Related Literature

Social capital

In the paper that first introduced the concept, Hanifan (1916) defined social capital as goodwill, fellowship, sympathy, and social intercourse among the individuals and families who make up a “social unit”. Despite the huge amount of research that followed the seminal works of Bourdieu (1980, 1986), Coleman (1988, 1990) and Putnam et al. (1993, 1995), the definition of social capital has remained elusive. Coleman (1990) describes social capital as a resource of individuals that emerges from social ties. According to Sabatini (2009) social capital, more than a concept, should be considered as a *praxis*, a code word used to join together disparate but interrelated research interests.

As stated in the introduction, Putnam et al. in 1993 defined the concept of social capital referring to three interdependent community factors: interpersonal trust, civic engagement and norms of reciprocity. A strand of the literature on social capital discriminates between bonding, bridging and linking social capital by classifying the links between the members of groups in terms of homogeneity (Putnam, 2000; Cote & Healy, 2001; Woolcock, 2001). Bonding (exclusive) social capital refers to relations between members of a network that perceive themselves as being similar in terms of their shared social identity. This happens in relatively homogenous groups such as family members and close friends. Bridging (inclusive) social capital, by contrast, refers to relations with distant friends, associates and colleagues. Putnam (2000) lists examples of these as being civil rights movements and ecumenical religious organisations. The group is open and characterized by the repetition of contacts. Because of these characteristics individuals trust one another completely and feel that they share some common value. Linking social capital introduces hierarchical or unequal relations, stemming from differences in power, resources or status.

Bridging social capital is what seems most likely to affect patient migration, since it might affect patient perception of a good and friendly health care environment but for the purpose of our analysis the distinction proposed by Uphoff (1999) between structural and cognitive social capital prove to be more useful. Structural social capital refers to individuals' behaviour and consists in social participation and civic engagement (e.g. meetings with friends and membership in organizations) while cognitive social capital derives from individuals' perceptions resulting in trust, values and beliefs that promote pro-social behaviour. The structural component describes properties of the networks that bring people and groups together; while the cognitive dimension is derived from mental processes and reflects people's perceptions of the level of trust, confidence, and shared values, norms and reciprocity. The cognitive dimension of social capital should affect patients' migration, since we argue that their "perception" of a good and friendly health care environment should be important in determining their choice of the place in which to be cured. We must stress, in any case, the fact that the two kinds of social capital are strictly interrelated. In high-social-capital communities, people may trust each other more because the networks in their community provide better opportunities to punish deviants (James & Coleman, 1990; Spagnolo, 1999).

Sabatini (2009) following Fukuyama (1999), and differently from a great part of the empirical literature, considers trust as an epiphenomenon, arising as a result of social capital, and not constituting social capital in itself. Guiso et al. (2004) argue that, since the concept itself is complex, most of the measures used in the literature are outcome based, and the majority of them may be the result of good law enforcement instead of the product of a high level of social capital. They use blood donation because is an outcome-based measure free from this criticism: in particular, there are neither legal nor economic incentives to donate blood.

When we look at the health care system, we find that the "informal professional culture" prevailing in communities characterised by higher social capital may create more "humane" and efficient health care systems (see Ahern et al., 2002) providing high-quality care to all segments of the population (Steinberg & Baxter 1998). Ahern et al. (2002) show that social capital might play a more important role than at least some of the structural health care sector variables in improving access to health care.

We are interested in investigating to what extent people choose to move towards health care systems located in other regions because they are searching a somewhat friendlier health care environment. Among the three dimensions of social capital proposed by Putnam et al. (1993) the one that we expect to be more strictly related to patient mobility is the generalized expectation of cooperative behaviour. We may suppose that patients living in regions characterized by this kind of bridging social capital are more likely to perceive their environment as friendly and reliable. The interpersonal trust dimension, emerging from social ties may be important too, but strong friendship relationships might become bonding and not bridging social capital. Active participation in public affairs, the other dimension proposed, might also be important but it is less related to trust and therefore less likely to affect patient mobility. Generally speaking, we expect cognitive social capital deriving from individuals' perceptions of the level of trust to be more important in determining patient mobility than structural social capital referring to individuals' behaviour and consisting in social participation.

Health care setting

The reforms that took place between 1992 and 2001 in Italy, with the approval of the constitutional reform, created 21 separate and autonomous regional health services where patients may freely choose where to be cured. Since then, the Italian health system has been characterized by a high and persistent patient mobility, that is assumed as being only compatible with relevant asymmetries between regional systems. Therefore, it is assumed that the greater the differences in quality between regional health services, the higher the number of patients who move towards the high-quality providers.

As stressed by Hill et al. (1997) and Levaggi & Zanola (2004) measuring quality at a regional level is a hard task. An initial dimension of quality to be considered may be described by structural variables. Structural variables (or supply side variables or provider characteristics) might be represented by indicators such as the number of beds and the technological endowment. The number of beds measures the hospital capacity of a Region. Levaggi and Zanola (2004) and Balia et al. (2018) found that, in Italy, greater public hospital capacity discourages outflows.

A second dimension of health system quality may be efficiency, that can be represented by indicators such as the comparative index of performance (CIP) and the case mix index (CMI) (Balia et al., 2018). Higher values of the CIP, which measures the ability of a regional health system to manage length of stays, indicating some inefficiency in managing the length of stay in hospitals, should be associated to higher outflows and make a region unattractive for extra regional patients. We might also have a negative relationship because patients might perceive longer stays as an insurance against bad health at home and so they might associate better quality with regions that have higher values for CIP and this would mean lower outflows and higher inflows. Balia et al. (2018) found that a higher CIP affects patient outflows positively. Inefficiency in managing the length of stay in hospitals may be associated with longer waiting times. Results based on European countries' data, often pathology specific, (Beckert el al., 2012; Sivey, 2012; Varkevisser et al., 2010) show that patients are more likely to move to providers with shorter waiting times. CMI, at a regional level, indicates the degree of specialization. Patients may move towards regions known to be more specialized or, because of too much specialization, patients may have to move looking for regions where less complex care is available. Balia et al. (2018) results show that at the origin specialization is associated with higher outflows.

Regarding technology endowment, Fabbri and Robone (2006) find that better technology leads to a greater attraction for patients from outside the region increasing patient inflows, but also that technology seems not to be significant in determining outflows.

In gravity models the distance from home to the place where you decide to be cured is an important determinant of patient mobility (France, 1997): a patient will migrate for health reasons if and only if the benefits of moving to hospitals in other regions outweigh the costs. Some more policy oriented studies, concerning Italy, also checked whether the existence of a specialised hospital of excellence such as Neuromed in Molise, or of accredited private providers affects patient inflows (Brenna & Spandonaro, 2015). One suggestion is that some regions might have increased the number of accredited provider because for them this means higher patient inflows from other regions.

Among the other variables that can be in some way correlated to the decision to migrate for health reasons there are economic and demographic variables, such as per capita income, regional agglomeration and the ratio of aged population. Regarding income, higher GDP per capita in the region of origin should mean more mobility since people can afford higher travel expenses but higher income at origin might also mean higher quality hospitals and better services discouraging patients to move for health reasons. Results from Italian data show that patients move from the poorer regions towards the richer ones (Balia, 2014; Fabbri & Robone, 2010; Fattore, 2014). Another important variable might be population density, since people living in less urbanized areas may move towards areas where a wide range of services is available. Regarding the ratio of aged population, frailer population groups, such as the over 75 age group, might show a higher demand for health services and then higher migration. On the other hand, patients belonging to higher age group may be less likely to move to providers outside their region (Levaggi & Zanola, 2004).

In the empirical part of our study we use, as control variables and determinants of the escape ratio, most of the variables cited and present in the literature.

Empirical framework

In order to evaluate the determinants of patients' passive mobility, we perform the econometric analysis using a panel dataset consisting of 20 Italian regions (currently 21 territorial units with data relative to Trentino Alto Adige taken separately for the two provinces of Trento and Bolzano) over the period 2006-2015. We use as a dependent variable the escape index (i.e. passive mobility ratio), while the independent variables are divided into proxies measuring the main aspects of social capital, and control variables representing the quality of regional health care system (like beds, infrastructure endowment and performance variables) and demographic factors, like regional per capita income, population density and the aged population ratio.

As a first step we estimate a pooled OLS regression with clustered standard errors, then we perform a random effect model (RE) and a fixed effect model (FE). The Hausman test for all specifications gives support to the random effect model.[1] From pooled OLS with clustered standard errors estimate we have an initial insight into the factors affecting patients moving from their region to another one to receive health care. However, we are aware of the number of limitations of pooling instead of using panel data models. First, intercepts are forced to be the same for all regions. Second, the pooled OLS estimator is not

[1] In random effect model with respect to fixed effect it is possible to introduce some time invariant explanatory variables (two variables in our analysis). The Hausman test has been done without introducing in fixed effects and random effects the time invariant variables.

consistent when the relationship between the two variables under investigation is governed by a third omitted variable. Therefore, we moved to a random effect model[2]

The complete random effect model is the following:

$$\boldsymbol{y_{i,t} = \alpha_i + \beta_i X_{it} + \gamma_i Z_i + \eta_{i,t}}$$

where

$$\boldsymbol{\eta_{i,t} = \alpha_i + u_{i,t}}$$

$\boldsymbol{X_{it}}$ represents the time varying explanatory variables for region *i* at time *t*

$\boldsymbol{Z_i}$ denotes the constant over time explanatory variables for region *i*

$\boldsymbol{u_{i,t}}$ is the error term.

Furthermore, as an additional step, in order to infer the possible presence of spatial interaction effects, and in particular of a pull effect from neighbour regions, we introduce a simple (albeit rigorous) spatial model, performed adding spatial lags of the exogenous variables in the original random effect specification. In particular, we exploit a simple spatially lagged regression model – the SLX model (Le Sage & Pace, 2009) - in order to test for the presence of exogenous interaction effects.

[2] We also estimate a random effects model in which to regressors there have been added group-means of variables which vary within groups (the so-called Mundlak correction). We introduce this correction for the sake of robustness in order to combine the advantages of both random and fixed effects. This technique was proposed by Mundlak (1978) as a way to relax the assumption in the random-effects estimator that the observed variables are uncorrelated with the unobserved variables (Bell & Jones, 2012; Mavromaras et al., 2010). The introduction of means should capture the correlation between the unobserved heterogeneity and the covariates that could render the random effect model inconsistent. All the group-means coefficients are insignificant therefore this correction does not add more information. Results are available upon request.

As described in a paper by Elhorst and Vega (2015) and already debated in Gibbons and Overman (2012), the SLX model is the simplest among the spatial models used to take into consideration local spatial spillover effects. Furthermore, the SLX overwhelms some identification issues that can be typical of an alternative model, such as for example the spatial Durbin model (SDM). Dealing with a panel data set we chose a random effect SLX model.

A crucial element of any model including spatial lags is the building of the spatial weight matrix. We rely on a distance-based matrix. In the case of a distance matrix, it is assumed that the intensity of interactions depends on the distance between the regions. In defining a distance matrix various indicators can be used, depending on the definition of the distance (great circle distance, driving distance, etc.) and depending on the chosen functional form (the inverse of the distance, the inverse of the squared distance etc.). Finally, a distance cut-off above which spatial interactions are negligible must be identified. Following a common practice in the literature (see, for example, Dall'Erba & Le Gallo, 2008), we use the great circle distance between regional centroids. In particular, each element of the spatial weight matrix is defined as follows:

$w_{ij}=0$ if $i=j$;

$w_{ij}=1/(d_{ij}^{k})$ if $d_{ij}<=D$

$w_{ij}=0$ if $d_{ij}>D$

where w_{ij} is an element of the row standardised weight matrix **W** (with row standardisation spatially weighted variables represent an average across neighbouring regions); d_{ij} is the great circle distance between centroids of regions i and j; k defines the functional form and D is the cut-off parameter above which spatial interactions are assumed to be negligible. In our specification we take the inverse of the squared distance (k=2) and we choose the median distance as a cut-off[3].

Data sources and description

Data sources

As already underlined in the previous section, we base our analysis on a panel data set at a regional NUTS II level (19 regions and 2 provinces) over the 2006-2015 time period. We use the escape index (*escape*) as the endogenous variable. *Escape* (i.e passive mobility ratio) is given by the percentage of residents hospitalized in other regions as compared to the total number of residents in a given region who have been admitted to hospital during the year (both in and out of the region). The data source is the Hospital Discharge data - Ministry of Health (*Ministero della Salute, Rapporto annuale sull'attività di ricovero ospedaliero. Dati SDO*).

Among the explanatory variables we have the social capital variables, the health system variables and the demographic and economic variables listed above:

- among social capital variables we introduce, for the "interpersonal trust dimension", the quality of friendship relations *(friend)* proxied by the percentage of households older than 14 years stating that they are very satisfied with their friendship relations. The source of this variable is the survey "Aspects of daily life" published annually by ISTAT (Istituto Italiano di Statistica). From the same source we have an indicator that may be used to measure the "active participation dimension" of local social capital, i.e. the percentage of households older than 14 stating that they were

[3] We test for robustness using different distance bands and W matrices based on contiguity.

involved in a social activity during the last year (*socpart*). The third dimension of local social capital, generalized cooperative behaviour", is proxied by the number of donors per 1000 inhabitants (*blood*). The source of data is the National and regional register of blood and plasma, filled out by every Transfusion Service published by the ISTISAN (Istituto Superiore di Sanità) the Italian National Institute of Health;

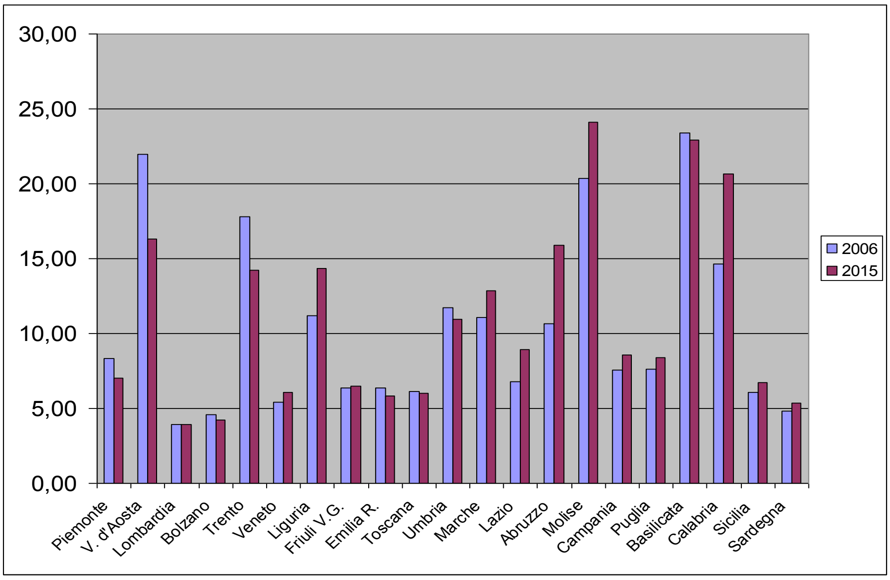
- among health system variables, the number of beds (*beds),* the Comparative Index of Performance (*CIP*), measuring the relative performance of the Regional Health Systems in managing hospital length of stays and the Case Mix Index (CMI) indicating the degree of specialization are taken from the NHS Statistical National Yearbook; the ratio of Magnetic Resonance with resolution higher than 5 tesla over total Magnetic resonance(*MRquality*) is taken from the Report on the detection of health equipment in Italy 2016 (*Rapporto sulla rilevazione delle apparecchiature sanitarie in Italia 2016*) – Ministry of Health;
- demographic and economic variables are per capita income (*income*), population per square kilometre (*popdens*) and the ratio of the total population aged over 75 (*over75*); the source of demographic and economic variables is Eurostat.

Data description

Dependent variable

With reference to the dependent variable, the average regional escape ratio increased between 2006 and 2015 in Italy from 10.32% to 10.95% (Figure 1). It is noticeable that, going from Northern regions (on the left) to Southern ones (on the right), we pass from a decreasing or stable escape ratio (with the sole exception of Liguria, which experienced a significant increase, and Veneto) to an increasing one (all the regions to the right of Umbria are characterized by increases in the escape ratio, often significant, with the sole exception of Basilicata which is in any case characterized by a very high escape ratio).

Figure 1: Regional patients' escape ratio



Tables A1 and A2 in the appendix show that the flow of patients is mainly from the South towards the North (when we look at the escape ratios towards each region higher than 1%, we get essentially an upper corner matrix). The average escape ratio is much higher in the South of Italy than in the Centre and in the North (Table 1) and patient outflows towards not neighbouring regions (indicated with a star in tables A1 and A2, mainly directed towards Lombardia, Emilia Romagna, Toscana and Lazio) are much higher in the South than in the remaining part of the country.

Explanatory variables

Data reported in Table 1 show that social capital is significantly lower in the South than in the Centre and North for all the three dimensions taken into account, i.e. the "interpersonal trust dimension" *(friend)*, the "active participation dimension" (*socpart*) and "generalized cooperative behaviour" (*blood*).

Southern regions are significantly poorer, younger and less densely populated than Northern and Central ones. Looking at health system variables, we may observe that, whereas the average number of beds *(beds)* and the *CMI* are significantly lower in the South than in the other areas of the country (indicating that Southern regional health care systems, on average, are characterized by a weaker and less specialized infrastructure), the mean value of the *CIP* in the Southern regions is about 1 (indicating that hospital stays are "in line" with the national mean). Concerning technology, the Magnetic Resonance quality (*MRquality*) seems even higher in the South than in the North and Centre of Italy. [4]

[4] This phenomenon is compatible also with the values of the more complex technology endowment index of Mazziotta and Pareto (2011), calculated for 2005 showing a mean value of 98.6 in the Centre-North and of 100.9 in the South.

Table 1 – Descriptive statistics

	Italy				*North*	*Centre*	*South*		
	Mean	***SD***	***Min***	***Max***	***Mean***	***Mean***	***Mean***	***Variable description***	***Data Source***
Variables									
Escape	10.6	5.9	3.6	24.3	9.1	9.0	13.0	Passive mobility ratio: % of residents hospitalized in other regions as compared to the total number of residents in a given region who have been admitted to hospital during the year	Ministry of Health
Income	26597.6	6863.6	16200.0	42600.0	32712.2	28002.5	19016.3	Regional per capita GDP (€)	EUROSTAT
Over75	10,5	1.6	6.8	15.5	10.8	11.5	9.8	Population aged over 75 over total population	EUROSTAT
Popdens	178.5	110.6	38.4	430.6	189.2	189.1	161.2	Population per square kilometre	EUROSTAT
CIP	1.0	0.1	0.9	1.2	1.1	0.99.	1.0	Comparative Index of Performance (CIP): a value up to 1 indicates that hospital stays are shorter or have the same length than at the national level.	Ministry of Health
CMI	1.0	0.1	0.9	1.1	1.0	1.0	1.0	Case Mix Index (CMI) indicating the degree of specialization: a value greater than 1 means a mix of cases which are more resource-intensive than the average and signify a greater specialization.	NHS Statistical Yearbook National
Beds	10134.7	9034.2	408.0	39713.0	11530.4	10576.4	8343.7	Number of beds	Ministry of Health
MRquality	77,2	20.1	0.0	95.0	72.3	80.3	81.1	Ratio of magnetic resonance with resolution higher than 5 tesla over total magnetic resonance	Ministry of Health
Friend	25,4	5.1	15.1	40.3	29.3	25.5	20.8	% of households older than 14 years stating that they are very satisfied with their friendship relations	ISTAT “Aspects of daily life Survey” (1).
Socpart	26.2	6.7	13,4	47,3	31.3	25.5	20.8	% of households older than 14 stating that they were involved in a social activity during the last year	ISTAT
Blood	29,2	5.2	17,27	45,26	31.2	29.6	26.9	Donors per 1000 inhabitants	Italian National Institute of Health

Results

Table 4 reports the results of pooled OLS (first column), RE model estimates (second column), and for sake of completeness we report also FE model (third column). The last column shows SLX (RE) model estimates described in the previous section. First of all, looking at the demographic and economic variables, we find that the escape ratio is higher the higher the percentage of elderly people (who have greater health demand and time and possibly resources to move). This result is confirmed by RE, FE and SLX models. Regarding population density, we find a significant negative relationship only in OLS. Per capita income coefficients estimate in the RE model (consistently with the results of Balia, 2014; Fabbri & Robone, 2010; Fattore, 2014) shows that patients move from the poorer regions towards the richer ones. It is interesting to notice that when spatial effects are introduced, regional per capita income is no more significant while that of neighbouring regions become significant (possibly indicating that the perception of living in a relatively poor area induce patient to move towards other not adjacent regions, and which are therefore costly to reach, as showed in tables A1 and A2).

With respect to the regional health system quality, we find that the smaller is the number beds in a region and the higher is CIP, the higher is the escape ratio. Coefficients estimates show a significant negative effect of the variable *beds* and a positive significant influence of CIP on the escape ratio in OLS, RE and FE models. A possible interpretation of these results is that a greater number of hospital beds, hence larger health care system, and lower CIP, shortening waiting lists, are perceived as an efficiency indicator in regional services provision and therefore discourage outflows (like in Levaggi & Zanola, 2004 and Balia et al., 2018). None of the models show a significant relationship between CMI and the escape ratio. The quality of technology (the percentage of *RMN>05*) is negatively and significantly related to the escape ratio only in pooled OLS. Robone and Fabbri (2006) find that better technology is not significant in determining outflow. They found that, on the opposite, it has a significant effect in attracting patients from outside the region increasing patient inflows. Consistently with their result, we find in the SLX model (column 4) that the variable *RMN>05* have a significant positive neighbour effect (i.e. the better is the quality of the technological endowment of neighbouring regions, the higher are patient outflows).

Interesting results can be found looking at the coefficients estimate of independent variables proxying social capital. Coefficient estimates in pooled OLS of the variables *friends, partsoc* and *blood* are significant with a negative sign, but when we look at the RE and FE models only the variable *blood* reduce significantly patient outflows. This variable, indicating a generalized expectations of cooperative behaviour, seems to reflect the perceptions of the level of trust, confidence and reciprocity in a regional environment relevant in the health care choice, more than the dimensions of interpersonal trust, related to the network of friendship relationships, and of social participation.

When we look at spatial lagged variables we find that most of the significant variables show the same sign as the unweighted variables coefficients. The escape ratio is higher the poorer, the less efficient (in term of beds and CIP) and the less endowed of social capital are neighbouring regions. This seems to suggest that the push effect of these variables is amplified by the perception of living in an area sharing the same problems. On the other hand, we find a significant pull effect of the quality of the technological endowment of neighbouring regions and of their population density, suggesting that patients are induced to move to other regional health care system when it is possible to reach at low cost a more urbanized region where a wide and better range of services is available.

Table 2 Estimated models for regional patient escape ratio in Italy, 2006–15.

Dependent variable: *escape ratio* (i.e. passive mobility ratio)				
	(1) Pooled OLS	(2) Random Effects	(3) Fixed Effects	(4) SLX (RE)
Income	0.154	-0.144**	-0.100	0.041
	(0.097)	(0.065)	(0.073)	(0.075)
Over75	0.536*	0.407***	0.387***	0.463***
	(0.607)	(0.126)	(0.126)	(0.147)
Popdens	-0.017**	-0.010	-0.035	0.009
	(0.008)	(0.008)	(0.023)	(0.011)
Beds	-0.003**	-0.002***	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
CIP	0.017*	0.021***	0.020***	0.020***
	(0.009)	(0.003)	(0.003)	(0.003)
CMI	18.200**	7.335	-	-7.834
	(17.340)	(20.180)		(16.410)
MRquality	-0.071**	-0.044	-	0.027
	(0.026)	(0.046)		(0.036)
Friend	-0.307*	-0.031	0.041	0.027
	(0.158)	(0.033)	(0.035)	(0.033)
Socpart	-0.279***	0.018	-0.023	0.008
	(0.093)	(0.035)	(0.032)	(0.040)
Blood	-0.389*	-0.097**	-0.078**	-0.121***
	(0.204)	(0.039)	(0.039)	(0.040)
Constant	3.452	-7.573	-1.053	-3.302
	(10.830)	(20.270)	(5.953)	(14.700)
Spatially lagged variables)				
Income				-0.428**
				(0.166)
Over75			.	-0.399
				(0.407)
Popdens				0.144**
				(0.071)
Beds				-0.006**
				(0.002)
CIP				0.023*
				(0.014)
CMI				-38.840
				(25.510)
MRquality				0.329**
				(0.167)
Friend				-0.003
				(0.086)
Socpart				-0.073
				(0.072)
Blood				-0.354***
				(0.125)
N	*210*	*210*	*210*	210
R-sq	*0.704*	*0.350*		
adj. R-sq	*0.689*	*0.249*		
Log lik.				-310.2

Notes: Number of regional units: 21; total number of observations: 210.Standard errors in parentheses.* p<0.10, ** p<0.05, *** p<0.01

Conclusions

The reform of 2001 was expected to foster convergence of Italian regions healthcare systems to a common level of efficiency. This process should have been accompanied by the progressive decrease of regional patient mobility but, in contrast, between 2006 and 2015 in Italy the average regional patient escape ratio increased. Our results show that regional patient escape ratio in Italy is significantly related to the lack of social capital. Social capital is a complex concept and contains different dimensions. We find, as expected, that the ratio of blood donors in the population, that may be considered a good proxy of inclusive social capital, is significantly and negatively related to the escape ratio in all the econometric modes estimated while this is not true for the quality of friendship relationships, that might represent bonding social capital when trust is limited to the members of the group of people linked by strong ties, and for the ratio of the population involved in a social activity, representing more a proxy of structural rather than cognitive social capital.

Referring to structural health system and quality variable we find, as expected, that larger health care systems and those that are more efficient in managing hospital length of stays discourage outflows and that the quality of the technological endowment of neighbouring regions stimulate patient outflows, i.e. technology endowment “works” more as a pull factor than as a push factor. For what concerns economic and demographic factors we find, like in most studies, that patients migrate more from poor regions towards rich ones and that the escape ratio is higher the higher the percentage of elderly people. The income of neighbouring regions is also significant meaning that the perception of living in a relatively poor area induce patients to move toward more rich and “structured” areas even if further.

Our results, in conclusion, suggest that patient mobility alone is not sufficient to achieve a more homogeneous health care system in a country like Italy characterized by economic and social inequalities among regions so deeply rooted in the history. Free patient mobility risks fostering a process of polarisation and worsening the situation, since patients coming from other regions bring extra funds with them. Growing escape ratios from weaker regions raise several concerns. A first concern, as suggested by Balia et al (2017), is about the long-run sustainability of the current decentralized Italian National Health Care System. Regional health system budget autonomy could not be entirely consistent with free patient mobility and health financing system would require the introduction of appropriate equalizing compensation schemes aimed at neutralizing the financial consequences of mobility.

Another important concern is about the importance of the "perceived reputation" of service providers. Patient escape ratio reflects the capacity of a region to 'answer' health care needs but also patient "perception" of quality. Improving quality of the health sector of Southern regions and the "perception" of this quality among the population should be a constant aim of Italian health sector policy makers. However, we must bear in mind that this perception not only depends on structural aspects of local health system but also on local social capital that is very difficult to modify in the short term and even in the medium term.

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Appendix

Table A1 ***Patients interregional mobility in 2006***

REGION OF HOSPITALIZATION	**REGION OF RESIDENCE**																				
2005	*Piem.*	*V.Ao.*	*Lom.*	*Bolz.*	*Tren.*	*Ven.*	*Fr.V.G.*	*Lig.*	*Em.R.*	*Tosc.*	*Umb*	*Mar.*	*Laz.*	*Abr.*	*Mol.*	*Cam.*	*Pug.*	*Bas.*	*Cal.*	*Sic.*	*Sard.*
Piemonte	**91,68**	**14,45**	0,65	0,03	0,11	0,08	0,07	**3,75**	0,18	0,14	0,10	0,08	0,07	0,07	0,08	0,17	0,17	0,39	0,54	0,24	0,25
Valle d'Aosta	0,19	**78,01**	0,02	0,00	0,00	0,00	0,00	0,04	0,01	0,01	0,00	0,01	0,00	0,01	0,00	0,00	0,00	0,01	0,02	0,00	0,01
Lombardia	**4,88**	**4,29***	**96,09**	0,63	**2,94**	**1,30**	0,87	**3,07**	**2,78**	**1,24****	0,88	**1,27**	0,51	0,69	**1,05***	0,92	**1,42***	**2,02***	**2,86***	**1,99***	**1,64***
P.A. Bolzano	0,02	0,03	0,04	**95,40**	**3,19**	0,23	0,10	0,05	0,06	0,04	0,02	0,03	0,04	0,01	0,01	0,01	0,02	0,01	0,02	0,02	0,02
P.A. Trento	0,02	0,02	0,08	0,97	**82,20**	0,29	0,06	0,06	0,07	0,03	0,02	0,03	0,03	0,01	0,01	0,01	0,02	0,02	0,03	0,02	0,02
Veneto	0,19	0,36	0,76	**1,78***	**9,37**	**94,55**	**3,74**	0,21	**1,27**	0,31	0,24	0,46	0,19	0,25	0,23	0,27	0,37	0,37	0,49	0,61	0,27
Friuli V.G.	0,03	0,10	0,04	0,07	0,17	**1,54**	**93,60**	0,03	0,05	0,05	0,22	0,04	0,04	0,03	0,04	0,06	0,06	0,04	0,05	0,11	0,05
Liguria	**1,34**	**1,02***	0,33	0,04	0,13	0,05	0,05	**88,83**	0,18	0,61	0,10	0,09	0,07	0,09	0,06	0,17	0,20	0,21	0,43	0,34	0,39
Emilia R.	0,40	0,43	0,93	0,53	1,01	**1,25**	0,60	0,83	**93,66**	**1,54**	**1,38***	**4,97**	0,46	**1,43***	**1,30***	0,65	**1,26***	**1,49***	**1,81***	0,84	0,63
Toscana	0,26	0,32	0,18	0,08	0,25	0,15	0,14	**2,48**	0,44	**93,89**	**2,87**	0,43	0,86	0,35	0,41	0,77	0,42	**1,19***	**1,19***	0,52	0,38
Umbria	0,02	0,03	0,02	0,01	0,02	0,02	0,01	0,02	0,03	0,72	**88,26**	0,77	0,91	0,15	0,24	0,08	0,14	0,31	0,19	0,03	0,04
Marche	0,04	0,08	0,06	0,03	0,05	0,04	0,03	0,03	0,41	0,11	**1,05**	**88,92**	0,19	**3,40**	0,51	0,07	0,23	0,13	0,07	0,05	0,03
Lazio	0,13	0,10	0,12	0,14	0,13	0,15	0,20	0,13	0,15	0,70	**3,93**	0,93	**93,23**	**2,84**	**4,01**	**2,35**	**1,09***	**2,79***	**3,14***	0,77	0,90
Abruzzo	0,05	0,04	0,06	0,03	0,05	0,03	0,04	0,04	0,08	0,05	0,37	**1,50***	**1,99**	**89,34**	**8,95**	0,17	0,88	0,38	0,11	0,05	0,03
Molise	0,02	0,01	0,01	0,01	0,00	0,01	0,01	0,00	0,02	0,02	0,05	0,04	0,33	0,78	**79,66**	0,75	0,45	0,26	0,10	0,02	0,02
Campania	0,12	0,12	0,13	0,07	0,11	0,09	0,19	0,09	0,21	0,21	0,23	0,15	0,57	0,15	**1,53**	**92,43**	0,26	**3,54**	0,53	0,09	0,07
Puglia	0,16	0,08	0,14	0,07	0,09	0,08	0,09	0,05	0,14	0,08	0,06	0,15	0,16	0,35	**1,83**	0,54	**92,39**	**8,37**	0,89	0,11	0,03
Basilicata	0,03	0,00	0,02	0,00	0,00	0,00	0,01	0,01	0,01	0,01	0,01	0,01	0,03	0,01	0,01	0,37	0,49	**76,64**	0,48	0,01	0,00
Calabria	0,16	0,25	0,10	0,05	0,03	0,03	0,03	0,08	0,08	0,06	0,08	0,03	0,12	0,02	0,03	0,15	0,07	**1,71**	**85,33**	0,22	0,01
Sicilia	0,16	0,09	0,13	0,04	0,09	0,07	0,11	0,11	0,11	0,11	0,09	0,06	0,10	0,03	0,03	0,05	0,05	0,10	**1,69***	**93,93**	0,06
Sardegna	0,11	0,17	0,08	0,03	0,05	0,04	0,04	0,09	0,07	0,08	0,04	0,02	0,09	0,01	0,01	0,02	0,01	0,02	0,01	0,02	**95,16**
RESIDENTS TOTAL	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Note: Escape ratios higher than 1% are bolded. We noted with * escape ratios toward not neighbouring regions

Table A2 ***Patients interregional mobility in 2015***

REGION OF HOSPITALIZATION	**REGION OF RESIDENCE**																				
2015	*Piem.*	*V.Ao.*	*Lom.*	*Bolz.*	*Tren.*	*Ven.*	*Fr.V.G.*	*Lig.*	*Em.R.*	*Tosc.*	*Umb*	*Mar.*	*Laz.*	*Abr.*	*Mol.*	*Cam.*	*Pug.*	*Bas.*	*Cal.*	*Sic.*	*Sard.*
Piemonte	**92,97**	**10,51**	0,73	0,04	0,09	0,07	0,08	**4,77**	0,12	0,18	0,07	0,10	0,11	0,13	0,18	0,21	0,19	0,39	0,74	0,32	0,27
Valle d'Aosta	0,22	**83,68**	0,02	0,00	0,00	0,00	0,00	0,09	0,01	0,01	0,01	0,00	0,01	0,01	0,00	0,00	0,00	0,01	0,04	0,01	0,02
Lombardia	**4,31**	**3,05 ***	**96,06**	0,68	**2,69**	**1,74**	0,93	**4,20 ***	**2,79**	**1,30***	0,96	**1,62***	0,74	**1,35 ***	**1,26***	**1,42***	**1,92***	**2,36***	**4,28***	**2,33***	**2,22 ***
P.A. Bolzano	0,01	0,01	0,03	**95,79**	**2,78**	0,21	0,09	0,03	0,04	0,03	0,02	0,03	0,03	0,01	0,02	0,01	0,02	0,02	0,03	0,01	0,02
P.A. Trento	0,01	0,02	0,09	0,81	**85,76**	0,32	0,05	0,04	0,07	0,03	0,02	0,03	0,07	0,03	0,01	0,02	0,02	0,04	0,04	0,03	0,02
Veneto	0,16	0,30	0,67	**1,63**	**6,67**	**93,90**	**3,77**	0,21	**1,10**	0,35	0,25	0,57	0,24	0,37	0,38	0,36	0,38	0,39	0,61	0,65	0,37
Friuli V.G.	0,03	0,03	0,04	0,06	0,10	**1,66**	**93,49**	0,04	0,04	0,03	0,04	0,06	0,04	0,03	0,03	0,06	0,06	0,04	0,07	0,16	0,05
Liguria	0,94	0,74	0,26	0,03	0,15	0,06	0,06	**85,68**	0,13	0,58	0,07	0,12	0,10	0,09	0,10	0,15	0,16	0,14	0,35	0,30	0,33
Emilia R.	0,38	0,44	**1,11**	0,43	0,89	1,32	0,72	0,94	**94,14**	**1,82**	**1,60**	**6,73**	0,75	**2,63 ***	**2,21***	0,87	**1,59 ***	**1,96 ***	**2,48 ***	**1,03***	0,68
Toscana	0,21	0,49	0,21	0,10	0,22	0,21	0,17	**3,36**	0,52	**93,96**	**4,21**	0,63	1,92	0,70	0,66	**1,03 ***	0,64	**1,40 ***	**1,67 ***	0,67	0,47
Umbria	0,02	0,03	0,02	0,01	0,02	0,02	0,03	0,03	0,04	0,66	**89,07**	**1,10**	**1,64 ***	0,29	0,39	0,10	0,13	0,24	0,29	0,06	0,04
Marche	0,04	0,02	0,05	0,02	0,05	0,04	0,04	0,03	0,30	0,07	**1,06**	**87,12**	0,31	**5,47**	**1,01**	0,08	0,45	0,22	0,11	0,05	0,03
Lazio	0,11	0,11	0,10	0,10	0,14	0,12	0,12	0,16	0,13	0,50	**2,14**	0,76	**91,07**	**3,30**	**4,15**	**1,87**	0,99	**2,48 ***	**3,42 ***	0,67	0,62
Abruzzo	0,04	0,03	0,04	0,02	0,07	0,02	0,04	0,02	0,05	0,04	0,12	0,75	**1,20**	**84,08**	**8,23**	0,12	0,26	0,12	0,08	0,03	0,02
Molise	0,01	0,01	0,01	0,00	0,00	0,01	0,01	0,00	0,01	0,01	0,03	0,03	0,37	0,72	**75,89**	0,88	0,35	0,10	0,05	0,01	0,01
Campania	0,11	0,10	0,13	0,09	0,08	0,07	0,14	0,10	0,15	0,17	0,16	0,13	0,85	0,30	**2,39**	**91,43**	0,34	**3,26**	0,82	0,13	0,08
Puglia	0,13	0,10	0,15	0,06	0,08	0,09	0,11	0,07	0,15	0,07	0,08	0,15	0,24	0,40	**2,91**	0,62	**91,61**	**9,31**	**2,02**	0,11	0,05
Basilicata	0,02	0,00	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,03	0,02	0,05	0,63	0,79	**77,10**	**1,24**	0,01	0,00
Calabria	0,08	0,13	0,07	0,04	0,04	0,02	0,03	0,04	0,05	0,04	0,03	0,02	0,09	0,01	0,07	0,10	0,05	0,34	**79,36**	0,12	0,01
Sicilia	0,11	0,08	0,12	0,04	0,08	0,07	0,09	0,08	0,07	0,07	0,04	0,03	0,09	0,04	0,03	0,04	0,04	0,07	**2,28 ***	**93,29**	0,04
Sardegna	0,09	0,13	0,08	0,03	0,06	0,03	0,03	0,09	0,05	0,06	0,03	0,02	0,10	0,02	0,03	0,02	0,01	0,01	0,02	0,03	**94,65**
RESIDENTS TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Note: Escape ratios higher than 1% are bolded. We noted with * escape ratios toward not neighbouring regions