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ABSTRACT

Public Employment and Political Pressure: The Case of French Hospitals*

This paper uses an unusual administrative dataset covering the universe of French hospitals to consider hospital employment: this is consistently higher in public hospitals than in Not-For-Profit (NFP) or private hospitals, even controlling for a number of measures of hospital output. NFP hospitals serve as a benchmark, being very similar to Public hospitals, but without political influence on their hiring. Public-hospital employment is positively correlated with the local unemployment rate, whereas no such relationship is found in other hospitals. This is consistent with public hospitals providing employment in depressed areas. We appeal to the Political Science literature and calculate local political allegiance, using expert evaluations on various parties' political positions and local election results. The relationship between public-hospital employment and local unemployment is stronger the more left-wing the local municipality. This latter result holds especially when electoral races are tight, consistent with a concern for re-election.

JEL Classification: D21, D72, I18, J21

Keywords: hospitals, public employment, unemployment, political preferences

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Public Employment and Political Pressure: The Case of French Hospitals

Andrew E. Clark and Carine Milcent

1. Introduction

The State is present in all market economies. This is particularly the case for public goods, of which two of the best-known are health and education. While the theoretical grounds for public-sector involvement, often expressed in terms of market failure, redistribution or economies of scale, are well-known, empirical evidence on how outcomes are produced across the public and private sectors has arguably been slightly harder to come by.

The research we present here focuses on the production of health, and specifically on employment levels in public and private hospitals. There is by now a substantial literature, both theoretical and empirical, which attempts to identify the impact of ownership structures in the hospital industry. Most of the existing empirical evidence regarding the effects of ownership on hospital outcomes is confined to work on U.S. data (see Sloan, 2000, for a review). However, the structure of the U.S. healthcare market means that it is not easy to disentangle the pure effect of hospital ownership from other institutional features such as the segmentation of insurance or payers and payment types (Lien *et al*., 2008). In a number of other countries, hospitals with a certain ownership type dominate the market, often either non-profit or public hospitals. In this case it is not possible to compare hospital performance between for-profit and other ownership types. In the work presented here, we can appeal to the rich institutional structure of the hospital sector in France to revisit an old question: do state-owned firms really employ too many workers?

One distinct advantage in using French data in this context is that public, non-profit and for-profit hospitals all represent significant shares of the hospital industry in France. However, this is not the only reason why France is a useful object of study. First, with respect to health insurance, French

National Health Insurance (the Sécurité Social) is a single-payer system. This eliminates any concerns about potential cost-shifting behaviour by providers, negotiation between providers and payers, or different reimbursement schemes for different payers. Second, the National Health Insurance scheme sets its own fee schedule. For-profit hospitals, which are the only hospitals that can select their patients, are paid on a fee-for-service basis. This mitigates concerns about patient selection in a prospective payment system, that is, hospitals may dump patients who are in worse health and are thus likely to cost more than the amount of the reimbursement (Meltzer *et al.*, 2002). Finally, French National Health Insurance covers almost all medical services. For hospital health care, all medical services are reimbursed except the additional fixed fee per day for catering and accommodation claimed by for-profit hospitals.

The reimbursement scheme is similar for public and non-profit hospitals, which (at the time of our data) were paid on the global budget basis. However, neither of these two hospital types is able to select their patients. As such, any incentive not to treat patients should be the same for public and non-profit hospitals. Staff status is similar in Private and NFP hospitals, where workers are salaried (or self-employed). On the contrary, employees are civil servants in Public hospitals (which workers are very difficult to fire). Staffing levels in Public hospitals are decided by the hospital's Board of Directors, which latter includes local government representatives, and in particular the Mayor. The Boards of Directors of Private and NFP hospitals include neither local government representatives nor the Mayor. As such, non-profit hospitals have the same reimbursement scheme as public hospitals but the same staff status and determination of staffing levels as for-profit hospitals. This distinction will be crucial to us below in interpreting some of the empirical results regarding employment across hospital types.

In France, public hospitals, non-profit hospitals and for-profit hospitals all comprise a significant share of the healthcare services sector. Some public hospitals provide preliminary basic health care. This is particularly true of local public hospitals, with relatively small numbers of beds. Other public

hospitals provide much more High-tech healthcare and a wider range of services in the context of a broader mission of care. This is the case of the Research and Teaching hospitals, which usually have more beds than other hospitals in the region. There is one such hospital in each of the French regions. The other public hospitals that do not fall into these two categories are largely comparable to the non-profit and for-profit hospitals, and provide the same types of healthcare. In the analysis in this paper, we present the results without distinguishing between public hospital types, but have checked that they are robust to dropping these research and teaching hospitals.

The French system therefore allows for a relatively clean comparison of the effects of hospital ownership for hospitals which arguably are providing similar types of healthcare services. The different kinds of hospitals are not randomly distributed across the country, partly for historical reasons. Non-profit hospitals are particularly prevalent in the East of France. This can be traced back to the 1901 Law on the separation of the church and the state, which obliged all French church hospitals to become State-owned public hospitals. However, in 1901 the East of what is now France was not French (it was German).[1] When this region became French again, the 1901 Law was not applied and Church hospitals there did not have to change status, which explains the over-representation of non-profit hospitals in the East.

While France's experience therefore may not be directly comparable to that in other countries, the analysis of French hospitals is particularly useful in that provides a good opportunity to uncover the pure effect of hospital ownership on the level of staffing.

In our administrative data covering all French hospitals in 1999, the number of staff employed in public-sector hospitals is greater than the number of staff employed in private-sector hospitals, for a given level of "health output" (as measured by the number and type of operations carried out, the care provided, and the bed capacity rate). Higher levels of public-sector employment are more prevalent for

[1] This historical fact was recently appealed to in the context of rules regarding the working week by Chemin and Wasmer (2009).

Nurses and (relatively unskilled) support staff positions. There is no significant difference in the employment of Doctors between the public and private sectors.

We interpret this result in the light of the explanations mentioned above. By controlling for both the type of patient and the type of health service produced, we hold constant a number of external factors which might explain this difference in employment levels. The greater employment in public-sector hospitals is not equally spread over the country, and in particular is more pronounced in regions with weaker labour markets, as reflected in the local unemployment rate. One reading of this correlation is that hospitals play a role on the labour market by providing employment for those who would otherwise likely struggle in economically-depressed areas. Another reading, which we will argue against in a number of ways, is that high-unemployment regions consist of individuals with greater health needs (that are not picked up by our existing controls).

Introducing local politics (measured by the votes cast at local elections) into employment decisions allows us to separate these two readings. This produces supporting evidence for the "Keynesian" role of hospitals:[2] the higher employment of less-skilled workers in public-sector hospitals is more prevalent in communities that voted Left-wing. This employment effect disappears in communities that voted Right-wing. Further, we appeal to the tightness of the most recent local elections. The greater Left-wing employment response to unemployment only occurs in tighter electoral races, consistent with public-sector employment reflecting not only the production of health, but also political prerogatives.

The paper is organised as follows. Section 2 briefly discusses research on employment in the public and private sectors. Section 3 describes the French healthcare sector and our administrative data on hospitals. Section 4 presents the initial regression results showing greater employment in public-sector hospitals, and Section 5 underlines the role of the local labour market and political context in moderating this relationship. Section 6 concludes.

[2] In this paper, Keynesian will be used in the sense of providing employment in depressed labour markets.

2. Public- and Private-Sector Employment

The broad question of the public-sector labour market is dealt with in the excellent survey by Gregory and Borland (1999) in the *Handbook of Labor Economics*. In this section, we will restrict ourselves to one broad question: that of the level of public-sector employment, as compared to the private sector.

A number of papers have considered differences in the organisation of public- and private-sector production. Haskel and Sanchis (1995) suggest that the public sector might be inefficient in a production sense because firms there internalise the costs of workers' effort: the public and private sectors therefore have different objective functions. Shleifer and Vishny (2002) provide a useful overview of various ways in which government intervention may be viewed. They distinguish between the "Helping Hand", where government intervention serves to overcome market failure and raise social welfare, and the "Grabbing Hand", where government agents act at least partly in their own self-interest.[3] Boycko *et al*. (1996) consider efficiency and employment in the public and private sector. As subsidies to private-sector firms are politically more difficult to support than foregone profits in the public sector (which are more difficult to observe), privatisation will reduce political influence in production. Along similar lines, Keefer and Knack (2007) use cross-country data to show that public investment is negatively correlated with the quality of governance, which they argue is consistent with some public investment consisting of rent-seeking.

In the context of health care, Gray (2000) discusses research on the quality of medical care in different types of institutions, and notes that the incentives in private health care will not necessarily yield productive efficiency: "*cost-containment is hopeless in a fee-for-service system*" (p.220). The

[3] Recalling the distinction between knights and knaves made by Le Grand (2007): "…*knightly doctors, teachers or social workers would be ones who put the needs and wants of their patients, pupils or clients above their own; whereas knavish professionals are those who prioritize their own immediate interests above those of the people they were supposed to serve*" (p.18).

existence of public-sector hospitals might therefore be interpreted as a "helping hand" alternative to the incentive problems that arise in private hospitals, at least those with this kind of payment system.

Direct tests of which sector is the most productive is difficult to carry out cleanly. One principal difficulty is that of measuring output, which would seem particularly pertinent in the areas where the public sector is prevalent, such as health and education. In addition, when individuals are heterogeneous, the comparison of outcomes may produce a biased measure of the value-added by the enterprise. In the context of health, private hospitals may be able to cherry-pick patients who are (unobservably to the econometrician) in better initial health, or who present a lower risk of complications. The health outcome measure for private hospitals, be it mortality, morbidity or some other measure of health quality, will then reflect both the value-added from the hospital and the initial selection of patients. Public-sector enterprises typically select less, by the very nature of their mission, rendering efficiency comparisons particularly problematic. The particular structure of the French health sector will be crucial here: we will argue below that the presence of non-profit hospitals will enable us to isolate any selection effect.

A further issue is what exactly should be compared: public- and private-sector entities may have different objectives. Again in the context of health, is hospital output entirely captured by patients' health outcomes, or are there also other social outcomes? In this vein, Sloan *et al*. (2000), in their analysis of hospital conversions in the USA, note that "*the net value to the community includes a range of social benefits, some of which are intangible*" (p.16). This extension of hospital output to a wider, perhaps more heterogeneous, set of outcomes can be thought of as a representation of the "helping hand" role of government intervention, whereby hospitals play role in alleviating some social ills that could be attributed to market failures.

A number of authors have tried to circumvent some of these problems. A well-known paper by Hoxby (2000) compares the productivity of public and private schools, and finds that competition resulting from the presence of private schools leads to an improvement in test scores in public schools,

even though spending per pupil in the latter remains unchanged. One interpretation is that there is inefficiency in public schools. Hoxby's results have, however, been challenged by Rothstein (2007), who claims that the results are not robust to including private school students in the sample, or to the way in which the exogenous formation of school district boundaries (via the presence of streams) are defined.

An alternative approach to the question is to move from cross-sectional to panel analysis, and consider transitions between sectors. One such transition is privatization. Melly and Puhani (2008) use data from two public-sector enterprises, one of which was privatized during the period considered. Their difference-in-difference results show that privatization increases wages across a broad range of skill groups, which is consistent with rising productivity (but also consistent with compensating differentials).

Brown *et al*. (2006) also consider privatization, here that of manufacturing firms in four ex-communist countries. Their basic OLS results suggest that privatization raised productivity in all four countries. Even in more demanding specifications with firm fixed effects and firm-specific time trends privatization is estimated to raise productivity in two out of the four countries.[4]

In the specific context of the health sector, one part of the large literature on productive efficiency has used DEA analysis to evaluate how close hospitals are to the production possibility frontier. Useful surveys of this burgeoning literature are provided by Hollingsworth (2003) and Worthington (2004). Some of the relevant papers have considered different types of hospital ownership. The results of the largely US-based studies discussed in Hollingsworth broadly suggest that the public sector is more efficient (see his Figure 4 on page 205); however, Worthington concludes in the opposite direction.[5] Case studies of hospital conversions (from Not-For-Profit to For-Profit) in the USA reveal

[4] The form of privatization matters, with privatization to foreigners associated with more positive productivity effects than domestic privatization.

[5] Efficiency measures are consistent but biased, with the bias depending on the number of observations, the number of input and output dimensions, and the density of observations around the relevant segment of the frontier. This makes efficiency comparisons across markets difficult unless the size and dimensions of the samples are similar. In addition, this type of analysis assumes that the objective functions in the different sectors are the same.

positive effects on hospital profits (although there is some debate as to whether this reflects increased efficiency or more aggressive accounting) together with a null or negative effect on hospital staffing levels (Cutler and Horwitz, 2000).

Our analysis considers the different economic and political influences on inputs, specifically employment, across sectors. The existing empirical evidence here is slighter. With respect to staffing levels, Gentry and Penrod (2000) use American data to show that the number of staff per bed is higher in Not-For-Profit than For-Profit hospitals (with median figures of 3.30 and 2.44 respectively); this difference continues to hold in a regression analysis which controls for various factors which might be thought to affect expected profit, including the local county population.

The analysis we carry out here is related to that in Alesina *et al*. (2000), who argue that "*public employment is used as a way of directing income toward disadvantaged groups*" (p.219). In their model, some public employment is a disguised transfer that avoids opposition to direct transfers. Their focus is on income inequality and ethnic fragmentation. They consider the level of public employment in US cities (of over 25 000 inhabitants) in the early 1990s. The number of government employees per 1000 of the total population or per 1000 of the working age population (18-64) is positively correlated with both inequality and ethnic fragmentation. They also find an initial positive correlation between government employment and local unemployment, although this is not robust to the inclusion of State dummies. Along similar lines, Alesina *et al*. (2001) argue that public-sector employment is excessive in the South of Italy, as compared to the North, and as a consequence public service production in the South is far less efficient than in the North. They conclude that half of the public wage bill in the South represents redistribution, either in the form of inefficient employment or excessive wages.

In this paper, we also attempt to understand the determinants of public employment. We do so using information on the universe of French hospitals, and compare employment in (two types of) private hospitals to that in public hospitals. We explicitly focus on local deprivation, as measured by the unemployment rate, as one potential determinant of hospital staffing. This is shown to affect

employment in public hospitals, but not employment in private hospitals. We will then show that the relationship between public employment and local unemployment is crucially moderated by the political position of the local council. We will broadly interpret these findings in terms of different perspectives on government intervention: the "helping hand" (overcoming market inefficiencies), as opposed to the "grabbing hand" (politicians' self-interest).

3. Staffing Levels in French Hospitals

French hospitals are of three broad types: Public, Private Not-For-Profit, and Private For-Profit. We shall refer to these as Public, NFP, and Private, for simplicity. Both NFP and Public hospitals are reimbursed according to a global budget system. As such, they receive a fixed amount of funding for the current year which does not depend on the current year's actual activity but rather on that recorded over the previous year.[6] Private hospitals are financed on a fee-for-service basis.

It is instructive to compare the systems of reimbursement and patient selection in France to that in the US. In the US, the way in which hospitals are reimbursed depends on the type of patient. Some hospitals may be reimbursed only by the Prospective Payment System (PPS), which fixes a certain payment per Diagnosis-Related Group (DRG).[7] Others will be reimbursed by both PPS for some patients and by Fee-For Service (FFS) for others, according to the patient's insurance type. All French patients are insured 100% by the State, excluding any selection by insurance type. In French hospitals then, patients only differ by their health problems; in the US they differ by their health problems and their insurance. Reimbursement in France depends only on hospital type and the illnesses treated: as

[6] The reality is somewhat fuzzier than this, which will allow hospitals some leeway in their current hiring decisions. In particular, the budget depends on the number of staff at the hospital and the number of beds. The declining number of beds may allow for additional hiring. In addition, the budget constraint in public hospitals has arguably been fairly soft: global budgets (which were introduced in 1983) were initially renegotiated every month and subsequently every three months.

[7] The DRG divides hospital cases up into around 500 groups, which contain similar pathologies requiring similar levels of hospital resource use.

noted above, public and NFP hospitals receive a global budget,[8] whereas private hospitals are paid via FFS.

Public and NFP are non-profit. If they do run a surplus in year *t*, this profit is rendered to the hospital regulator, and will be subtracted from their budget in *t+1*. Public and NFP hospitals are legally forbidden to select patients, and the reimbursement system effectively gives them no incentive to do so. All other things equal, patients generally prefer hospitals that are closer to their place of residence. As public and non-profits offer the same types of healthcare services and (as noted above), the distribution of non-profit hospitals is exogenous, the case-mix of patients (type or mix of patients treated by a hospital) is similar between these two types of hospitals. One point to note here is that we do control for both illness severity and the cost weight in our regressions. Further, Public and NFP hospitals have been shown to treat a very similar range of pathologies (DREES (Ministry of Health), 2008). As such they do not differ in terms of reimbursement, selection or health-care services. This is not true for private-sector hospitals, where patients can be selected in order to maximise profits.

In spite of the differences in the reimbursement schemes, FP hospitals in France are distinct from non-profit hospitals in a variety of legal and economic ways similar to those in the United States. First, FP hospitals are managed and controlled by Doctors who own the organisation and therefore its profit. By way of comparison, NFP hospitals do not have owners, but have self-perpetuating boards that have control rights. Moreover, NFP hospitals are entitled to receive charitable contributions.

The three broad French hospital types do not differ only in their reimbursement procedures and the possibility of patient selection: there are also substantial differences in the statute of their employees. Employees in NFP and Private hospitals are private-sector workers, whereas those in Public hospitals are civil servants (*i.e.* public-sector employees). As such, these latter cannot be laid off for economic reasons.

[8] A Payment-Per-Service system (widely known in the US as a Prospective Payment System - PPS) has been partially implemented in both NFP and Public hospitals since 2004. One of the goals of this reform was to unify the reimbursement system and thereby to introduce a degree of competition between hospitals.

The pay of the civil servants in Public hospitals does not depend in any immediate way on their performance, but is rather determined more by their qualifications and their tenure in the job. Staffing levels in Public hospitals are decided by the Board of Directors. This Board includes three separate types of members: medical-staff representatives, patient representatives, and, crucially, local-government representatives, including the Mayor. These latter do not figure in the Board of Directors of Private and NFP hospitals. As such, local politics may well play a role in determining employment in Public hospitals in a way that it does not in NFP or Private hospitals. The Mayor is elected by the commune's inhabitants of voting age; as such Mayors have an obvious interest in satisfying the local electorate in order to conserve their position at the next election. In terms of the subject matter of this paper, the Mayor may well wish to encourage employment in order to tackle local unemployment, even if the health-production case for such hirings is less clear.

NFP hospitals thus occupy something of a hybrid position. While they operate under the same budgetary and selection constraints as Public hospitals, their staffing levels are determined in the same way as those in Private hospitals. This distinction will be critical to us later in the paper in the interpretation of the regression results: NFP hospitals are subject to the same public-health requirements as Public hospitals, but without any direct political influence on staffing.

The administrative data used in this paper come from the 1999 SAE survey[9] (*Statistiques Annuelles des Etablissements*), which collected information on hospital staff and activities. We initially match in some local-area information (covering age distribution, unemployment, and nationality at the communal level) from the 1999 French Census. The data covers the universe of French hospitals. These 1788 establishments are split up into 736 Public hospitals, 193 NFP hospitals, and 859 Private hospitals.

The SAE survey includes information on hospital size (as measured by both the number of beds and the number of admissions per year), and the type of care that is provided to patients. Our key

[9] As such, the data are previous to the budgetary reform acted for NFP and Public hospitals mentioned above.

variable here is hospital staffing levels. In this respect, the SAE survey provides information on the number of Administrative staff, Support staff, Medical staff and Doctors. Support staff includes, for example, those working on buildings and grounds, as well as those who provide social assistance to patients. Medical staff consists of Nurses (including Specialised Nurses), Paramedical Staff (for example, physical therapists and dieticians) and nursing auxiliary staff. The four staffing groups differ notably by qualification level. Support staff are the least-qualified group, and Doctors the highest-qualified group. However, both Nursing and administrative staff consists of both qualified and unqualified workers. For example, some of the nursing auxiliary do not have professional training (namely the ASH: "*agent de service hospitalier*").

The employment levels of Administrative, Support and Medical staff are calculated using information on hours of employment to produce a figure for the number of full-time equivalents. As these types of employees are salaried, this information is readily available. The resulting levels of employment are comparable between the three hospital types.

The situation is somewhat less clear with respect to Doctors, who are civil servants in Public hospitals but are private-sector salaried or self-employed (*profession libérale*) in both NFP and Private hospitals. The staffing levels of Doctors is therefore known in public hospitals, but less so in private and NFP hospitals. In the latter, doctors are self-employed and are associated with a patient rather than a specific number of hours in the hospital. Calculating the number of full-time workers is therefore not straightforward, and relies on a number of assumptions. We have thus calculated a measure of hours of employment for self-employed Doctors, but it should be borne in mind that Doctors' employment is not measured in exactly the same way across hospital types.

This paper focuses on hospital staffing levels. For a given size of hospital, staffing levels differ by hospital type. The raw figures are presented in the top panel of Table 1. Public hospitals employ more staff than do NFP or Private hospitals. All of the differences in employment levels are significant at the five per cent level, and most at the one per cent level.

Part of the difference in staffing levels reflects hospital size, as some Public-sector hospitals are much larger than those in other sectors. One way of measuring size is the yearly number of admissions. As a first pass at looking at staffing levels by hospital type, we split yearly admissions up into four categories: up to 5000; between 5000 and 10 000; between 10 000 and 16 000; and over 16 000. These particular cut-points are those used by the French Ministry of Health in their comparisons of hospitals by size. No public hospitals have fewer than 5 000 admissions, and all public Research and Teaching hospitals have over 16 000 admissions.[10] The table in Appendix A shows average employment levels by both number of admissions and hospital type.[11] Unsurprisingly, total employment rises with the number of admissions. However, even within size-class, Public-sector hospitals employ more workers than do their non-Public counterparts. Another way of reading this table is to say that employment grows with number of admissions for all hospital types, but it grows faster for Public hospitals than for other hospital types.[12] Similar results pertain with the number of beds as the measure of hospital size.

There are many reasons why staffing levels might differ between public and private hospitals, even conditional on hospital size. In particular, we might think of the health-care services that are provided, and the type of patients that are treated. This may well result from the ability of private hospitals to select their patients. As noted above, public and NFP hospitals are not allowed to select patients. And even were they to manage to do so, it is reasonable to imagine that they would do so in the same way, as they have the same reimbursement schemes. While employment may then differ between FP hospitals and the others due to case-mix, this should not be the case between NFP and public hospitals. To the extent that NFP and public hospitals have different objective functions, we also formally control for hospital activity in terms of cost weight, using hospital administrative records. Each hospital stay is associated with a DRG. Each DRG is allocated a 'weight', which is

[10] The analysis in Table 1 was also performed on the sample excluding public teaching hospitals: the main results are unchanged.
[11] Somewhat more recent 2004 hospital employment data show exactly the same patterns.

dependent on the average cost of inputs (e.g. nursing, diagnostic services, procedures) required to achieve the appropriate patient outcome. The hospital cost weight is the sum of all the DRGs of the stays in the hospital over the year. This index was first used in US; it is now also used in France where it is called the ISA ("*indice synthétique d'activité*"). One drawback of using the hospital cost weight is that some observations are lost in the merging of the hospital cost-weight data.

We add this cost-weight variable as a control in our regression analysis. Intuitively, this reflects differences in "what hospitals do" in the sense of the types of care that they use to treat patients. Its inclusion here therefore specifically picks up the different types of treatment that may be offered in public and non-public hospitals. Treatment types can be more or less labour-intensive, and we wish to be sure that any public hospital employment effect is not simply reflecting more labour-intensive treatments. We should note that we do not necessarily have any strong prior assumptions regarding the relationship between cost weight and employment: some very costly procedures are not particularly labour-intensive. The following analysis controls for both cost weight and illness severity, as well as a number of characteristics of the local population (at the municipality level).[13]

4. Employment in Public and Private Sector Hospitals: Regression Analysis

Table 2 shows the results of a regression of hospital employment on a number of hospital-level and municipality-level explanatory variables. Specifically, at the hospital level we control for the mean ISA per stay (the cost weight), the number of beds (as an additional measure of hospital size)[14], the severity of the illnesses treated (as measured by the Severity Gravity Index, SGI[15]), and the bed-

[12] This is most flagrant for the largest admissions category, but it also holds in the other size groups.
[13] We have checked that all or four key empirical results are identical in the larger number of hospitals when cost weight is not controlled for, and in the smaller hospital sample when it is.
[14] Adding this variable actually produces no significant change in the other estimated coefficients.
[15] We use Deyo's adaptation of the Charlson co-morbidity index to measure the severity of co-morbidities (Deyo, 1992; Ghali, 1996). The Charlson index, which is expressed as a six-level variable, is constructed for each stay. This index is greater than 0 when a surgical procedure has been carried out on the patient. Validation exercises have shown that this index predicts mortality in longitudinal data (Hamilton and Hamilton, 1997).

occupancy rate. The estimates here use the level of the employment as the dependent variable. The results are unchanged when we instead use the log of hospital employment as the dependent variable (which variable gives more weight to employment in smaller hospitals). At the municipality level, we introduce the percentage of the population who are in the 60-74 and 75+ age groups, the local unemployment rate,[16] and the percentage of the population who are foreign-born.

The first two columns of Table 2 show the results when total employment is regressed on the same size and hospital-type classification as used in Appendix A. All twelve of the elements in Appendix A appear here as dummy variables (there is thus no constant in the regression). This first regression reproduces the same statistical information as the figures in Appendix A. The regression on the right-hand side of Table 2 includes a number of control variables which might plausibly be considered to be correlated with the demand for healthcare and therefore the number of hospital employees.

The left-hand side of Table 2 shows that, without any other control variables, employment increases with hospital size. However, the employment-hospital size elasticity is far greater in public-sector hospitals than in other types of hospitals. We cannot reject that smaller hospitals (as measured by the number of admissions) have the same number of staff whatever their type; however, this equivalence fails for larger hospitals. The addition of the other explanatory variables on the right-hand side of Table 2 sharpens this conclusion: conditional on these other determinants of employment, Public hospitals employ more staff.

The full specification explains a great deal of the variation in hospital employment, with an adjusted R-squared of over 0.9. The two key variables determining employment (apart from hospital type and the number of admissions) are the number of hospital beds, which adds additional

[16] An alternative to the local unemployment rate is a dummy variable for whether the municipality is in an area designated as a "*Zone Urbaine Sensible*" (ZUS). These latter are urban zones defined as priority targets of local politics, according to a certain number of indicators of local problems. The Law of November 14, 1996 defined a number of tax and social policies, which are used to address these problems. All of our results with respect to unemployment can be reproduced using the ZUS dummy. As ZUS status changes less over time, it can be thought of as a more permanent indicator of local social malaise.

information about hospital size[17], and the severity of the illnesses that are treated. Perhaps surprisingly, employment falls with the bed occupancy rate. In fact this negative bed-occupancy result is due to the presence of three very large central hospitals in France: APHP (Assistance Public-Hôpitaux de Paris), APHM (Assistance Public-Hôpitaux de Marseille) and HCL (Hospices Civil de Lyon).[18] The hospital cost weight turns out to be significantly negatively correlated with employment, which is consistent with very costly treatments being less labour-intensive. Last, as a whole the municipality-level variables considered here only add relatively little to our understanding of hospital employment. The coefficient on the local unemployment rate is positive and significant with a t-statistic of just over 2.

The conclusion from Table 2 is therefore that employment rises with hospital size and the severity of the illnesses treated. In addition, conditional on size, hospital cost weight and illness-severity, public-sector hospitals consistently employ more staff than do NFP or Private hospitals. Last, local area variables do not have huge explanatory power for hospital employment. The measure of local deprivation, the unemployment rate, is not particularly strongly positively correlated with hospital employment. However, we shall see that this aggregate correlation actually masks widely-varying employment-local deprivation relationships by hospital type. Further, the strength of these latter correlations is moderated by local politics. This is the subject of the next section.

5. Hospital Employment: Labour-Market Tightness and Political Allegiance

The regression in Table 2 supposed that local labour market conditions have the same effect on employment across all hospital types. The empirical results below will show that this is a poor supposition: unemployment in fact only affects employment in public-sector hospitals. For

[17] We did look for non-linearity in this relationship, but the number of beds was strongly preferred to the log of the number of beds in terms of explanatory power.

[18] These three mega-units have higher bed-occupancy rates in the raw data, but lower bed-occupancy rates conditional on the other explanatory variables on the right-hand side of Table 2. All of the key results in the rest of the paper include these three large central hospitals, but are robust to their exclusion.

presentational reasons, we henceforth introduce separate hospital type dummies (i.e. no longer interacted with the number of admissions) and control for hospital size independently via the number of beds. To check for heterogeneity in the local unemployment – hospital employment relationship, we interact the local unemployment rate with hospital type (Public, NFP, and Private). These three interaction variables thus replace the "local unemployment rate" variable of Table 2 in the employment regression.

We estimate two separate empirical models. The first, on the left-hand side of Table 3, reproduces the analysis in Table 2, but now with only the three separate hospital type dummies (instead of hospital type interacted with hospital size). The estimated coefficients repeat the message from Table 2: Public hospitals have higher staffing levels than other hospitals, and employment rises with the local unemployment rate.

The model on the right-hand side of Table 3 interacts the local unemployment rate with hospital type. The main effects of the Public, NFP, and Private dummies in this specification are now insignificant. As such, when unemployment is low the regression results suggest that all hospital types would employ the same number of staff (for a given number of beds, hospital cost-weight and illness severity). The difference in employment between hospital types then works entirely through local deprivation. As Table 3 shows, the interaction between the Public hospital dummy and the local unemployment rate is positive and significant, with a t-statistic of 4. By way of contrast, the estimated coefficients on the interactions between the other hospital types and the local unemployment rate are both very insignificant. The greater hospital employment that comes with local deprivation (as shown in the left-hand side of Table 3) then results exclusively from more jobs in public-sector hospitals. Employment in both NFP and Private hospitals is independent of the local unemployment rate.[19] The other explanatory variables have much the same relationship with hospital employment as in Table 2.

[19] That the public sector effectively provides partial insurance against unemployment is consistent with lower wages in the public sector (via a compensating differential) and with regional unemployment reducing the life satisfaction of private-sector workers more than their public-sector counterparts (Luechinger *et al.*, 2010).

We then consider the different categories of medical staff. These are divided up into four groups: Administrative staff, Support staff, Medical staff and Doctors. Support staff are mostly lower-qualified. We carry out the same type of employment regressions as for the whole sample in Table 3; the results are presented in Table 4. Local unemployment has no significant effect on the employment of all four kinds of personnel in both NFP and Private hospitals. Table 3's aggregate figure did not therefore hide any specific effects for certain types of personnel. The situation is different in Public hospitals. Here local unemployment positively affects the staffing levels of Nursing, Support and Administrative staff, and a positive but insignificant effect on the employment of Doctors.[20] Public hospitals then seem to react to local labour-market conditions in an entirely different way from non-public hospitals. The estimated coefficients in Tables 3 and 4 are consistent with Public hospitals playing a Keynesian role in providing employment in depressed areas (except for the group that arguably have the best employment prospects: Doctors).[21]

One reading of the coefficient on local unemployment here is that it is picking up the morbidity of the local population (and thus the demand for healthcare). We think that this is unlikely for two reasons. First, the regressions control for both the Illness Severity Index of the patients and the cost weight of the procedures that are used to treat them: together these two should supply an accurate description of what hospitals do to their patients. Second, if unemployment does reflect morbidity, it only seems to do so in Public hospitals. It is true that Private hospitals can cherry-pick their patients, and may thus be insulated from any general worsening of the client population's health. This would explain why employment in Public hospitals reacts to local deprivation while employment in Private hospitals does not. However, we do not believe that the link between unemployment and morbidity explains the results in Tables 3 and 4, in the light of the estimated coefficients on NFP hospitals.

[20] As noted previously, Doctors are only group for which information regarding hours of work is not harmonised between sectors. That we find significant public-sector unemployment effects for all groups where hour measurement is harmonised between sectors is reassuring.

[21] Alternatively, it may be the case that the labour market for Doctors is more national than local, weakening any local-level correlation.

These hospitals are very similar to Public hospitals in that they do not select their patients, and they treat similar pathologies. Were local unemployment to be a measure of the demand for health, we would therefore expect it to have a similar impact on Public and NFP hospitals. In fact it has no impact on employment in the latter. The cleavage in the effect of local unemployment on employment is thus in terms of whether employment decisions are influenced by local politicians (as they are in Public hospitals, but not NFP or Private hospitals),[22] rather than in terms of whether the hospitals can select their patients (Private) or not (Public and NFP).

The numbers in Tables 3 and 4 are therefore consistent with employment in Public hospitals reflecting both political and health priorities. To formalise the potential role of political preferences, we consider the possibility that the employment-local unemployment relationship be mediated by political factors. A growing literature has developed around the idea of political business cycles, with a smaller empirical counterpart that has explicitly considered political influences on public employment. Coelho *et al*. (2006) identify pre-election employment effects in Portuguese municipalities, especially for the Right. In the context of the current paper, they do not relate this employment effect to the municipal unemployment rate. Lamo *et al*. (2007) appeal to aggregate data and do find evidence of lagged procyclicality of a number of measures of public sector activity, although the evidence with respect to public employment seems less strong.

We will here relate the strength of the hospital employment-local unemployment relationship to the political position of the local municipality. To do so, we appeal to the Political Science literature and use expert evaluations of various parties' political positions to calculate a weighted political stance score for each commune. We will then show that the Public Hospital response to local unemployment is muted in more right-wing communes.

Our expert evaluation scores come from Laver *et al*. (2006), who show not only the positions of French parties on the most salient policy dimensions, but also the relative importance that parties

[22] As Boycko *et al*. (1996) note, "*One key objective of politicians is employment*".

attach to each dimension. Laver *et al*. estimate the policy positions by conducting an expert survey in which they collected the judgements of French political scientists on the policy positions of the French parties. This survey followed the model of expert surveys conducted by Laver and Hunt (1992), and provides a score for each party regarding their "social policy" (for more details, see the Appendix in Laver *et al*., 2006). This score takes values between 2.5 to 18.9, with higher scores referring to more Right-wing parties.

There are two ways of calculating a political score for each hospital, according to the round of the local elections. Both of these require that we match our hospital data to local election results in the different municipalities. French local elections take place every six years,[23] and consist of two rounds. In the first round, there is no limit on the number of candidates who can stand. To be elected directly in the first round, a candidate must receive more than 50 per cent of the votes cast. Barring this relatively unusual outcome, the two candidates with the most votes in the first round go forward to compete against each other in a second round. The first method of calculating local political scores then consists in taking the "social policy" score of the party to which the winning candidate (in either the first or the second round) belongs. The second method consists in calculating a weighted score using the percentage voting scores from the first round of the election.

It is not *a priori* clear which of the two political scores (weighted first round scores, or the winning party only) will be more appropriate. We want to measure the political "flavour" of each local municipality. The winning score will indeed tell us which party is in charge, but will not reveal the ease of the victory. This latter is important, as the number of seats on the local council depend on the number of votes cast: losing parties will thus also be represented. On the other hand, first-round voting is sometimes argued to be either strategic or to contain a certain "protest" element. In the remainder of the paper we will use the first-round method of calculating local political scores. In practice, both

[23] The fact that elections all take place on the same day means that it will not be possible to test for strategic pre-election political behaviour (as in Levitt, 1997), as the pre-election period cannot be identified separately from any macro developments.

calculation methods produce remarkably similar regression results. Our data refer to the local elections of 1995. It can be argued that these are some distance in time from the observation of hospital employment in 1999. Using results from the following local elections, in 2001, produces similar results.

We require data on the number of votes for each party in each round of local elections. These data are unfortunately not available for communes with fewer than 10 000 inhabitants. For the sub-sample of larger communes we can thus match electoral outcomes directly to the hospital; for the smaller communes we will have to use the electoral results at a more aggregated level (known as the ZE, *Zone d'Emploi*, level). We expect this latter imputation to introduce measurement error. We thus have two samples, and two sets of estimation results. The first comes from direct matches, and concerns a smaller number of hospitals in larger communes; the second set of estimates will come from a larger sample, but where one of our key variables is less-accurately measured. We expect that the standard errors will be lower in the second case (due to the larger sample) as will the estimated coefficients (as a result of attenuation bias). This is in fact what we observe in the results.

Our final political variable is called "Right". Since the different parties' positions regarding "social policy" take values between 2.5 to 18.9, so does our political variable. It should be remembered that "Right" is a continuous variable, and not binary.

We first present results for the smaller sample where we can match hospitals exactly to voting outcomes. The top half of Table 5 shows the estimated coefficients on interactions between local political position and hospital type in an employment regression. These show that the more Right-wing a local area is, the lower is the level of employment in Public hospitals; there is no significant effect of local politics on employment in either NFP or Private hospitals. The negative effect of "Right" on employment is found for total employment, and for employment in each of the four groups (except for Support staff, where the estimated coefficient is negative but not significant). All of the regressions in Table 5 control for all of the other explanatory variables that appeared in Tables 2-4.

The bottom half of Table 5 brings together the results from Table 4 (with respect to local unemployment rates) with those from the top half of Table 5 (regarding local Politics). The regressions here include two sets of interactions. The first (as in Table 4) interacts hospital type with the local unemployment rate; the second then interacts this unemployment interaction with local Politics. The first set of interactions thus tells us how hospital employment moves with local labour market conditions, and the second set tells us whether the size of the first interaction depends on the Left/Right position of the local municipality.

The results first show that, as in Table 4, employment in Public hospitals increases with the local unemployment rate. Further, the estimated coefficients on the second set of interactions show that this "Keynesian" effect is diminished as the local municipality moves to the right. Neither local labour-market conditions nor local politics have any significant effect on employment in NFP or Private hospitals.

Table 6 reproduces exactly the analysis in Table 5, but for the larger sample of hospitals that results from matching in Political information at the ZE level. The same results continue to hold in this larger sample. As we suspected, the standard errors are generally smaller (due to the larger sample), but so are the estimated coefficients (due to attenuation bias). These results are again consistent with public-sector hospitals playing a Keynesian role, increasing employment in slack labour markets. This response is smaller in more Right-wing areas.

To illustrate this effect, we have carried out a number of simulations of employment in Public hospitals. These are shown in Table 7, which consists of two panels. These correspond to the bottom panels of Tables 5 and 6. There are three lines within each panel. The first shows what we call a "Baseline" level of employment at a public-sector hospital. This is predicted from the employment regressions, setting hospital type equal to Public, and all other variables at their sample average. In other words, this is the predicted level of employment at a public-sector hospital in a municipality with exactly average characteristics

We then carry out two changes to these average characteristics. First, we change the local political tapestry by shifting ten per cent of voters from the *Parti Socialiste* (Left-Wing) to the *RPR* (which is now known as the *UMP*; Right-Wing). As a result, the value of the "Right" variable increases (by just under one, in fact). The second change consists in reducing the local unemployment rate from the sample average of just over fifteen per cent[24] to ten per cent. We calculate the predicted percentage change in employment due to these changes. Both reduce Public-hospital employment, although the effect of falling unemployment is much larger. This Table shows that the fall in employment is felt across all types of Staff. However, the effect of unemployment is particularly strong amongst Support Staff. This is the least-educated group, and arguably that which is most at risk when the labour market sours.

Interpretations

The results so far indicate that public-sector hospital employment reacts to local labour markets and politics very differently from employment in not-for-profit and private hospitals. This last sub-section considers a number of potential explanations of this result.

1) *Unemployment and Wages*

It is fairly firmly established that greater levels of local unemployment reduce local wages (Blanchflower and Oswald, 1990). Might increased hospital employment be part of a natural labour market response to falling wages? There are three reasons to doubt this interpretation. First, if this were so, we would expect to see increased employment across all hospital types. Second, in the public sector, wages are largely fixed at the national level. Last, it is unclear why local politics in Tables 5 and 6 should mediate any wage response to unemployment.

[24] This is the average unemployment rate of the municipalities in which there is a hospital and is not weighted by

2) *Unions*

Higher employment in public hospitals might reflect stronger public-sector unions, and unions may react to local unemployment. Two remarks seem salient here. First, while union membership is very low in France, collective bargaining coverage is close to universal (OECD, 1997), so there is little coverage differential between the public and private sectors. Second, union membership is far more prevalent amongst Doctors than it is amongst Nurses and less-qualified workers, yet it is exactly for this latter group that we estimate the greatest employment response to local unemployment.

municipality size. As such it is not representative of the unemployment rate in France.

3) *Helping Hand or Grabbing Hand?*

Local politicians may react to local unemployment by increased public-hospital employment for two reasons: to overcome market failure, or for their own interests. If politicians receive some rent from greater employment, then it will be in fact difficult to distinguish between the grabbing and helping hands. But if we consider that politicians' self-interest partly reflects their desire to be re-elected, then a natural test presents itself. Levitt (1997) appealed to time differences in local elections to establish an exogenous effect of policing on crime. Here we consider a cross-section analogy: how close the result was in the most recent election. We distinguish between tight races, where the difference between the winning party's votes and the other parties' votes was less than the median across the sample of municipalities used in Table 5 above, and not-tight races where the winning margin was larger that this median figure. With the helping hand, we imagine that parties would have greater latitude to push through their priorities when their majority is larger: the political effect on employment will then be greater in not-tight races. However, under the grabbing hand parties may try to please voters more when there is a greater chance of being voted out next election: here we expect the political effect on employment to dominate in tight races.

We thus re-estimated the bottom panel of Table 5 separately for tight and not-tight elections. The results are shown in Table 8. The first set of estimated coefficients in each panel show that public hospitals employ more people in high-unemployment regions, in both tight electoral races and not-tight electoral races. The second set of estimated coefficients shows that the left-right position of the local municipality only matters in tight electoral races. This is consistent with either more left-wing municipalities increasing employment when unemployment is high, or more right-wing municipalities reducing public-sector employment in tighter labour markets. With larger political majorities, when the outcome of elections is more certain, these Left-Right differences disappear.

6. Conclusion

This paper has considered public employment and political pressure by looking at employment in three different types of French hospitals. Administrative data provide us with hospital-level information on the employment of four different kinds of workers, as well as hospital size, the kind of illnesses treated and so on. We first show that public hospitals employ more staff than do non-public hospitals, conditional on size and illnesses treated.

Public and NFP hospitals cannot cherry-pick their patients, and therefore have to deal with cases that are (unobservably in this dataset) more difficult to handle, and thus require more staff. Equally, public and NFP hospitals likely provide different degrees of care than private hospitals, which again we measure only imperfectly. It is therefore difficult to judge the employment gap in terms of the efficiency of health-care production.

In this paper, we have shown that this employment gap depends on local economic and political conditions. By appealing to differences between hospital types, we suggest that hospital employment is affected by political influence. Between public hospitals (where employment is decided in part by local politicians, and which cannot select their patients) and private hospitals (with no political influence, and which can select their patients) there is a third category: NFP hospitals. Employment in these hospitals is also independent of political influence, but these hospitals cannot select their patients. The fact that public hospitals employ significantly more staff than both private and NFP hospitals is consistent with the method of deciding employment rather than patient selection being behind the differences in employment.

We further support this reading of the data by looking at how the employment gap varies with two key local-level variables: the unemployment rate and the results of recent elections. We first show that employment in public hospitals is strongly positively correlated with the local unemployment rate, whereas this is not true for other hospital types. We then show that this dependence between public-hospital employment and the local unemployment rate is moderated by local politics. In particular, the more Left-wing the local commune, the stronger is the relationship between local unemployment and

public-hospital employment. All of these relationships are more significant for lower-skilled workers. These results lead us to suspect that public hospitals play a dual role, partly being used as a policy instrument to provide local employment.

There are a number of implications. A straightforward one is that employment in areas which have public-sector hospitals will move differently over the economic cycle to employment in areas with non-Public hospitals, or no hospitals at all.

A second policy implication concerns the debate over the introduction of competition between hospitals whatever the sector. The employment externalities that we think we have found in our data call for some caution in comparing performance across hospital types. In particular, public hospitals may be providing employment to those who would otherwise struggle in a slack labour market (a "helping hand" activity[25]). It is entirely possible that this "surplus" employment, which comes from differences in the objective functions across sectors, will penalise Public hospitals in competitive health markets. However, a broader notion of public service may include not only good service to patients, but also the needs of the local community in terms of employment. Any comparison between the public and the private sectors purely in terms of the cost efficiency of the health service provided to patients will be inherently biased against the public sector, and may tell a misleading story with respect to social welfare. The question of whether this kind of job creation is a good way of using public money is crucial, but not one that we can answer with our current data.

Shleifer and Vishny (2002) distinguished between government actions that served to increase social welfare and actions that served to increase politicians' self-interest: the helping and grabbing hands, respectively. The finding that public-sector employment reacts positively to local unemployment is arguably consistent with both readings. Greater employment may raise social welfare, or alternatively increase the resources that politicians control or their re-election chances. In this optic, it is of interest to ask why the employment response should be greater for Left-wing rather

than Right-wing administrations. The helping hand reading is that Left-wing councils believe that the externalities from unemployment are higher; the grabbing hand reading is that local politicians follow their electorates' preferences in this matter in order to preserve their own position. The finding that local politics only matters when the previous election was relatively tight is consistent with the latter reading.

Last, and perhaps most generally, we might wonder to what extent French hospitals are a special case. It would be of great interest to see whether the same employment effects exist in other areas of Public-sector activity, such as the railways, education and local administrations, and indeed whether we have uncovered an "*exception française*", or whether the employment-unemployment-politics nexus is a general characteristic of the public sector in other countries.

[25] This not only benefits those who obtain such jobs. Lower local unemployment may more broadly improve the quality of local life: see Öster and Agell (2007) for the relationship between unemployment and crime.

Appendix A. Employment Levels by Size and Hospital Status

	Public	***NFP***	***Private***
< 5000 Admissions	168.5 N=415	148.9 N=122	89.5 N=590
5000-10 000 Admissions	489.2 N=110	394.3 N=54	211.8 N=218
10 000-16 000 Admissions	802.4 N=76	644.4 N=11	377.4 N=44
> 16 000 Admissions	3133.6 N=135	1339.8 N=6	578.6 N=7

Table 1. Hospital Employment Levels and Variable Means

Hospital Type	*No. of Hospitals*	*No. of Employees*	*Std. Dev.*	*Minimum*	*Maximum*
Public	736	825.7	3143.0	17.4	77253.6
NFP	193	282.8	287.2	10.8	1906.0
Private	859	139.3	104.9	4.0	935.3

Note: Number of employees measured in FTEs.

Variable	*No. of Observations*	*Mean*	*Std. Dev.*	*Minimum*	*Maximum*
No. of Beds	1713	66.80	247.14	1	9216
No. Employees	1744	6802.42	18409.93	2	606298
Illness Severity	1788	5.09	25.23	0	768.92
Cost Weight (ISA)	1361	918.49	304.48	71.16	2848.27
Bed Occupancy Rate	1718	73.81	18.36	0.18	179.71
Local Unemployment Rate (/100)	1788	0.148	0.048	0	0.356
Local % Foreign-Born (/100)	1788	0.062	0.046	0	0.297
Local % Aged 60-74 (/100)	1788	0.140	0.031	0.029	0.251
Local % Aged 75+ (/100)	1788	0.093	0.034	0	0.313

Table 2. Hospital Employment Regressions

	Coeff.	**Std. Err.**	**Coeff.**	**Std. Err.**
Public (<5000)	168.45*	(92.87)	263.26*	(143.7)
Public (5000-10000)	489.24***	(180.39)	257.54*	(141.17)
Public (10000-16000)	802.40***	(217.03)	241.58*	(143.62)
Public (16000+)	3133.63***	(162.84)	616.54***	(139.97)
PSPH (<5000)	148.90	(171.29)	10.13	(154.57)
PSPH (5000-10000)	394.33	(257.47)	35.56	(155.62)
PSPH (10000-16000)	644.40	(570.46)	89.18	(250.39)
PSPH (16000+)	1339.85*	(772.4)	266.88	(303.94)
Private (<5000)	89.53	(77.89)	-49.99	(126.99)
Private (5000-10000)	211.77*	(128.14)	-76.79	(131.7)
Private (10000-16000)	377.39	(285.23)	-72.32	(153.2)
Private (16000+)	578.56	(715.11)	-255.56	(244.04)
Number of Beds			7.55***	(.07)
Illness Severity			6.69***	(.66)
Cost Weight			-0.12**	(.06)
Bed Occupancy Rate			-1.79**	(.89)
Local Unemployment Rate (/100)			688.20**	(335.36)
Local % Foreign-Born (/100)			-49.65	(364.59)
Local % Aged 60-74 (/100)			-535.20	(906.3)
Local % Aged 75+ (/100)			174.93	(870.79)
Number of observations	1788		1327	
Adjusted R-squared	0.182		0.948	

**** = significant at the 1% level; ** = significant at the 5% level; and * = significant at the 10% level.*

Table 3. Hospital Employment and Local Deprivation

	Coeff.	**Std. Err.**	**Coeff.**	**Std. Err.**
Public	387.13***	(134.6)	178.68	(152.79)
PSPH	65.96	(143)	224.89	(221.37)
Private	-37.01	(127.22)	55.18	(132.45)
Public*Local Unemployment			2312.95***	(579.61)
PSPH*Local Unemployment			-111.33	(1122.4)
Private*Local Unemployment			339.08	(428.1)
Number of Beds	7.60***	(.07)	7.61***	(.07)
Illness Severity	7.25***	(.65)	7.13***	(.65)
Cost Weight	-0.15**	(.06)	-0.15**	(.06)
Bed Occupancy Rate	-1.50*	(.88)	-1.55*	(.87)
Local Unemployment Rate (/100)	931.98***	(333.7)		
Local % Foreign-Born (/100)	-6.85	(364.52)	-16.84	(364.06)
Local % Aged 60-74 (/100)	-1016.20	(905.2)	-1049.57	(903.14)
Local % Aged 75+ (/100)	134.82	(870.3)	224.84	(869.31)
Number of observations	1327		1327	
Adjusted R-squared	0.947		0.947	

**** = significant at the 1% level; ** = significant at the 5% level; and * = significant at the 10% level.*

Table 4. Hospital Employment and Local Deprivation: By Staff Type

	Nurses				Support Staff			
	Coeff.	**Std. Err.**	**Coeff.**	**Std. Err.**	**Coeff.**	**Std. Err.**	**Coeff.**	**Std. Err.**
Public	226.32***	(82.83)	97.11	(94.02)	127.40***	(27.77)	74.40**	(31.47)
PSPH	0.82	(87.99)	93.56	(136.22)	56.99*	(29.5)	104.80**	(45.59)
Private	-45.71	(78.28)	11.91	(81.5)	22.37	(26.25)	45.21*	(27.28)
Public*Local Unemployment			1457.51***	(356.65)			550.22***	(119.36)
PSPH*Local Unemployment			-7.11	(690.65)			-115.05	(231.14)
Private*Local Unemployment			231.15	(263.43)			51.86	(88.16)
Number of Beds	4.77***	(.04)	4.78***	(.04)	1.14***	(.01)	1.14***	(.01)
Illness Severity	4.34***	(.4)	4.27***	(.4)	1.50***	(.13)	1.47***	(.13)
Cost Weight	-0.09**	(.04)	-0.09**	(.04)	-0.02*	(.01)	-0.02*	(.01)
Bed Occupancy Rate	-0.98*	(.54)	-1.01*	(.54)	-0.17	(.18)	-0.19	(.18)
Local Unemployment Rate (/100)	603.08***	(205.34)			197.00***	(68.85)		
Local % Foreign-Born (/100)	-90.10	(224.31)	-95.68	(224.02)	-52.71	(75.21)	-56.04	(74.97)
Local % Aged 60-74 (/100)	-439.22	(557.01)	-460.35	(555.73)	-575.24***	(186.76)	-583.16***	(185.99)
Local % Aged 75+ (/100)	1.24	(535.54)	57.93	(534.92)	143.67	(179.56)	165.43	(179.02)
Number of observations	1327		1327		1327		1327	
Adjusted R-squared	0.949		0.949		0.911		0.911	

	Administrative Staff				Doctors			
	Coeff.	**Std. Err.**	**Coeff.**	**Std. Err.**	**Coeff.**	**Std. Err.**	**Coeff.**	**Std. Err.**
Public	23.35	(15.63)	4.35	(17.77)	10.05	(14.33)	2.82	(16.32)
PSPH	9.76	(16.61)	29.27	(25.74)	-1.62	(15.23)	-2.74	(23.64)
Private	-14.82	(14.78)	-6.82	(15.4)	1.15	(13.55)	4.88	(14.15)
Public*Local Unemployment			208.82***	(67.4)			96.39	(61.91)
PSPH*Local Unemployment			-45.34	(130.51)			56.17	(119.88)
Private*Local Unemployment			31.31	(49.78)			24.76	(45.72)
Number of Beds	0.90***	(.01)	0.90***	(.01)	0.79***	(.01)	0.79***	(.01)
Illness Severity	0.81***	(.08)	0.80***	(.08)	0.60***	(.07)	0.60***	(.07)
Cost Weight	-0.02***	(.01)	-0.02***	(.01)	-0.02***	(.01)	-0.02***	(.01)
Bed Occupancy Rate	-0.19*	(.1)	-0.19*	(.1)	-0.16*	(.09)	-0.16*	(.09)
Local Unemployment Rate (/100)	81.53**	(38.76)			50.37	(35.54)		
Local % Foreign-Born (/100)	70.93*	(42.34)	69.48	(42.33)	65.03*	(38.82)	65.39*	(38.88)
Local % Aged 60-74 (/100)	12.80	(105.14)	10.14	(105.02)	-14.54	(96.4)	-16.21	(96.46)
Local % Aged 75+ (/100)	-36.85	(101.08)	-29.41	(101.08)	26.76	(92.68)	30.90	(92.85)
Number of observations	1327		1327		1327		1327	
Adjusted R-squared	0.948		0.948		0.942		0.942	

**** = significant at the 1% level; ** = significant at the 5% level; and * = significant at the 10% level.*

Table 5. Politics, Unemployment and Hospital Staffing: Reduced Sample

	All		Nurses		Support Staff		Administrative Staff		Doctors	
Public	888.39***	(227.39)	538.73***	(139.71)	219.81***	(46.89)	69.79***	(26.46)	60.06**	(24.22)
PSPH	67.85	(450.96)	10.22	(277.08)	58.88	(93)	6.79	(52.48)	-8.05	(48.03)
Private	72.39	(197.12)	12.70	(121.11)	56.95	(40.65)	-2.29	(22.94)	5.03	(20.99)
Public*Right	-36.13**	(15.01)	-23.83***	(9.22)	-3.92	(3.1)	-3.67**	(1.75)	-4.71***	(1.6)
PSPH*Right	4.12	(38.5)	0.63	(23.66)	2.22	(7.94)	0.69	(4.48)	0.59	(4.1)
Private*Right	-3.72	(11.6)	-2.46	(7.13)	-0.19	(2.39)	-0.76	(1.35)	-0.31	(1.24)
Local Unemployment Rate (/100)	922.97**	(414.17)	592.83**	(254.47)	185.49**	(85.41)	84.27*	(48.2)	60.38	(44.11)
Number of observations	1072		1072		1072		1072		1072	
Adjusted R-squared	0.949		0.951		0.914		0.950		0.944	
	All		**Nurses**		**Support Staff**		**Administrative Staff**		**Doctors**	
Public	211.38	(205.12)	103.65	(126.03)	110.15***	(42.25)	2.16	(23.89)	-4.58	(21.91)
PSPH	242.07	(285.44)	95.79	(175.38)	114.54*	(58.8)	38.80	(33.25)	-7.07	(30.49)
Private	122.17	(171.68)	42.43	(105.48)	75.81**	(35.37)	-2.84	(20)	6.78	(18.34)
Public*Local Unemployment	5216.72***	(1274.57)	3315.30***	(783.12)	934.64***	(262.57)	511.91***	(148.47)	454.87***	(136.14)
PSPH*Local Unemployment	940.03	(2406.56)	792.83	(1478.63)	15.82	(495.76)	41.50	(280.33)	89.89	(257.06)
Private*Local Unemployment	601.83	(935.94)	397.23	(575.06)	61.15	(192.81)	87.45	(109.03)	56.01	(99.97)
Public*Local Unemployment*Right	-240.93***	(92.09)	-154.96***	(56.58)	-32.37*	(18.97)	-24.13**	(10.73)	-29.47***	(9.84)
PSPH*Local Unemployment*Right	-89.31	(223.09)	-72.33	(137.07)	-4.84	(45.96)	-11.41	(25.99)	-0.73	(23.83)
Private*Local Unemployment*Right	-34.77	(71.41)	-22.32	(43.88)	-2.96	(14.71)	-5.77	(8.32)	-3.72	(7.63)
Number of observations	1072		1072		1072		1072		1072	
Adjusted R-squared	0.949		0.951		0.915		0.950		0.944	

*Note: All regressions also control for Number of Beds, Illness Severity, Cost Weight, Bed Occupancy Rate, the local % Foreign-Born, the local % Aged 60-74, and the local % Aged 75+. *** = significant at the 1% level; ** = significant at the 5% level; and * = significant at the 10% level.*

Table 6. Politics, Unemployment and Hospital Staffing: All

	All		Nurses		Support Staff		Administrative Staff		Doctors	
Public	745.80***	(187.92)	460.22***	(115.61)	181.84***	(38.78)	55.41**	(21.86)	48.32**	(20.02)
PSPH	99.73	(400.33)	43.39	(246.28)	56.81	(82.62)	8.84	(46.56)	-9.30	(42.65)
Private	19.69	(164.96)	-11.03	(101.49)	32.02	(34.04)	-6.90	(19.19)	5.59	(17.57)
Public*Right	-31.41**	(12.57)	-20.86***	(7.73)	-4.00	(2.59)	-2.93**	(1.46)	-3.62***	(1.34)
PSPH*Right	-2.09	(34.76)	-3.56	(21.39)	0.68	(7.17)	0.12	(4.04)	0.66	(3.7)
Private*Right	-3.90	(10.33)	-2.55	(6.35)	-0.22	(2.13)	-0.72	(1.2)	-0.41	(1.1)
Local Unemployment Rate (/100)	913.93***	(345.9)	593.69***	(212.8)	192.82***	(71.39)	78.18*	(40.23)	49.24	(36.85)
Number of observations	1274		1274		1274		1274		1274	
Adjusted R-squared	0.948		0.949		0.911		0.948		0.943	
	All		**Nurses**		**Support Staff**		**Administrative Staff**		**Doctors**	
Public	183.65	(159.92)	95.69	(98.38)	83.47**	(32.95)	3.33	(18.62)	1.15	(17.09)
PSPH	238.03	(231.59)	102.39	(142.46)	111.29**	(47.72)	30.10	(26.97)	-5.75	(24.75)
Private	63.10	(137.81)	15.24	(84.78)	50.97*	(28.4)	-7.57	(16.05)	4.46	(14.73)
Public*Local Unemployment	4561.45***	(1041.88)	2932.89***	(640.93)	860.96***	(214.67)	418.65***	(121.32)	348.95***	(111.33)
PSPH*Local Unemployment	987.85	(2188.53)	845.13	(1346.3)	19.96	(450.93)	65.16	(254.84)	57.60	(233.86)
Private*Local Unemployment	667.27	(815.83)	442.64	(501.87)	75.58	(168.1)	86.60	(95)	62.44	(87.18)
Public*Local Unemployment*Right	-208.23***	(78.77)	-135.77***	(48.46)	-29.22*	(16.23)	-19.65**	(9.17)	-23.58***	(8.42)
PSPH*Local Unemployment*Right	-112.34	(202.51)	-87.71	(124.58)	-13.58	(41.73)	-11.68	(23.58)	0.63	(21.64)
Private*Local Unemployment*Right	-34.66	(64.16)	-22.32	(39.47)	-2.71	(13.22)	-5.66	(7.47)	-3.97	(6.86)
Number of observations	1274		1274		1274		1274		1274	
Adjusted R-squared	0.948		0.95		0.912		0.948		0.943	

*Note: All regressions also control for Number of Beds, Illness Severity, Cost Weight, Bed Occupancy Rate, the local % Foreign-Born, the local % Aged 60-74, and the local % Aged 75+. *** = significant at the 1% level; ** = significant at the 5% level; and * = significant at the 10% level.*

Table 7. Estimated Public Hospital Employment Effects of Politics and Economics

	All	Nurses	Support Staff	Administrative Staff	Doctors
Table 5 - bottom					
Baseline	904.1	568.1	179.0	91.6	65.4
10% vote switch Left to Right	-3.9%	-4.0%	-2.7%	-3.9%	-6.6%
Unemployment rate drops from 15% to 10%	-17.0%	-17.0%	-19.1%	-16.2%	-12.5%
Table 6 - bottom					
Baseline	875.9	550.8	168.2	90.6	66.3
10% vote switch Left to Right	-3.5%	-3.6%	-2.5%	-3.2%	-5.2%
Unemployment rate drops from 15% to 10%	-15.4%	-15.5%	-18.7%	-13.3%	-8.5%

Table 8. Politics, Unemployment and Hospital Staffing: The role of Tight Electoral Races

	All	Nurses	Support Staff	Administrative Staff	Doctors
Tight Electoral Races					
Public*Local Unemployment	4,814.881***	2,946.857***	1,027.530***	458.568**	381.926**
	(1,678.391)	(982.524)	(378.714)	(179.193)	(162.459)
Public*Local Unemployment*Right	-239.458**	-143.292**	-51.415*	-21.253*	-23.499**
	(118.476)	(69.356)	(26.733)	(12.649)	(11.468)
Not-Tight Electoral Races					
Public*Local Unemployment	4,341.659***	2,658.628***	918.184***	405.742**	359.105**
	(1,604.447)	(950.395)	(353.054)	(169.383)	(160.675)
Public*Local Unemployment*Right	-101.600	-61.311	-19.053	-6.156	-15.080
	(119.418)	(70.737)	(26.278)	(12.607)	(11.959)

Note: All regressions also control for the other variables indicated in Table 5. *** = significant at the 1% level; ** = significant at the 5% level; and * = significant at the 10% level.

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