Market entry in the care homes sector[*]

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First version: January 2016
This version: March 2016

Abstract

This study investigates the effects of house prices in the English care homes market. High house prices, as experienced currently in England, may disincentive the entry in certain markets restricting the access to long term care services in these areas. Alternatively, these areas may also suppose business opportunity. We provide evidence in order to disentangle these effects. Our results suggest that higher house prices increase the rate care homes. Based on unique dataset that collates information from several sources our analysis exploits planning regulations to address empirical limitations associated with the house prices. Our findings contribute to inform policy makers about the relationship between the long term care and housing markets.

Keywords: Care homes, house prices, long-term care, England
JEL: R31, I12

Contents

1 Introduction

England has experienced the fastest growth in house prices amongst all OECD country during the last decades. This inflationary trend has had consequences for both households, materialised in the so called "house affordability crisis", and to less extent businesses. In this paper we investigate the relationship between the house prices and the market structure of an industry that typically operates with low margins, the care homes that provide long term care services. Our interest in the long term care is not trivial. Elements such as the ageing of the population or some socioeconomic changes that include the inclusion of more women in the labour force as well as the composition of different family structures, have shifted informal caregiving towards more formal long term care provision. These patterns evidence the importance of this sector in the forthcoming decades. Yet, despite the will of policy makers to design policies that preserve a sustainable provision of long term care and that also ensure competitive market structures, there is limited evidence for the design of these policies. We aim at informing these policies by analysing the extent of the effect of high prices in the housing market on the entries in the market of care homes.

A major characteristic of the English market for long term care services consists of the geographical disparities in the levels of provision and funding and the consequent effects on other variables of interest for the market structure. Forder and Fernández (2011) analysing data at local level, highlight the substantial differences in both the level of need and the unit costs across English councils. This spatial variability seems to appear also in other variables of interest such as the levels of social care expenditure (Fernandez and Forder, 2015). According to these authors, a principal element to explain this local divergences are the underlying conditions that providers face for supplying their services. Considering this, we argue that an element that may influence the structure of the market for long term care services concerns the situation relative to the housing market. Alike the former, the housing market in England also presents notable divergences across local areas that lead to different levels of prices. Several authors have argued that this is a direct consequence of the different designs associated with the planning regulations across the country. Hence, more restrictive planning regulations result in higher levels of house prices (see for instance, Cheshire (2009) or **?** for comprehensive reviews).

The effect of house prices on the market entry of care homes is a priori uncertain. One possible explanation may consist of the influence of house prices as a cost for running a care home. Hence, high house prices may suppose an important barrier that can restrict the entry in certain markets. A potential consequence derived from the former,

people living in these areas may find less long term care choices closer to them. A second argument may be on the basis of how high house prices may represent a business opportunity. The segment of the population that benefits from current upward trend in the house prices are those elderly homeowners that are able to monetize the higher value of their asset by selling their houses and moving out cheaper areas (**?**). If this argument holds, areas with higher prices may be associated with greater levels of affluence and consequently greater proportions of clients that are more willing to pay for the services of a care home. Although the latter may contribute to preserve the financial viability of care homes in the market, an issue that constitutes a current public policy concern, it may also result in an unequal distribution of long term care across different areas in England where the most affluent areas are more benefited from a greater supply of home care services.

In order to proceed with our analysis, we construct a unique dataset that merges information from several sources to collate information regarding the characteristics of the dynamics in the care homes market, the housing markets and the planning regulations. The dataset captures information regarding local authorities at different level (e.g. street, district and county level). A first technical hurdle concerning the dataset, consists of distinguishing de novo entries associated with providers that effectively produce a new activity. Secondly, there is an additional empirical caveat that we have to address with regards to effect of house price on care homes entries. It may be possible that care homes select markets that have high prices on a non-random basis due to unobservable variables. This sample selection bias may invalidate the estimates corresponding to the effects of house prices. In order to overcome these, we carry out and identification strategy which uses an instrumental variables approach that exploits the variability in the restrictiveness of planning regulations across English districts. Our identification relies on the assumption that changes in the planning requirements affect the entry of care homes in market through the levels of house prices. Our instrumental variables estimates indicate a positive relationship between the market entries and the house prices suggesting increases in the proportion of care homes of 0.21 when house prices increase by a 10%. We then can argue that higher house prices lead to greater market entries. These results suggest that providers would be focusing on areas where there are more expensive houses.

To the best of our knowledge, no previous studies have been undertaken to provide causal evidence with regards to the effects of housing prices in the context of entries in the market of care homes. This research also makes a number of contributions to several strands of the literature. It provides further evidence to the growing literature

that analyses aspects associated with the market of care homes in England. Forder and Allan (2014) study the elements that determine the competition amongst care homes and assess the consequences of this competition in both prices and quality. Also Allan and Forder (2015) evaluate empirically the causes of market exits by investigating the effects of maintaining minimum standards in the quality of the service. We extend this literature by addressing issues referred to the entry of care homes in the market. Prior to this paper, only Machin et al. (2003) have provided empirical evidence of factors affecting the market entry by analysing the effects of setting of a minimum wage. In addition to providing a more up to date evidence, this research uses a more extensive dataset provided by the regulator, the Care Quality Commission (CQC). Likewise, this research also extends the literature that studies the effects of the planning system and the high house prices in England using the care homes as a new sector for the analysis.

The rest of the paper is organised as follows. In the next section we introduce the institutional framework corresponding to the organisation of the local authorities responsible for planning activities and long term care. In Section 3 we outline the details associated with the sources of data and the variables used. Section 4 describes the empirical model and section 5 present the results. Finally, the main conclusions of the paper are shown in section 6.

2 Institutional background

In England planning and long term care are activities that are ruled and applied by local governments. The structure of these is nonetheless complex and entails different organizational levels[1] depending on the type of services that are regulated. In this section we outline the main characteristics of the local government in England considering the particular cases of planning regulations and long term care. This will help to understand the geography that we adopting for our empirical analysis.

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[1]These levels or tiers include three main groups: (i) county councils, (ii) district, borough or city councils and (iii) parish or town councils. Most of the activities designed by local governments are developed at county or district level (group (i) or (ii))

2.1 The English market for long term care

In England there are 152 local authorities that operate at council level[2] and have responsibilities on long term care through the commissioning – e.g. purchase, of services. Since the mid-eighties, market mechanisms drive the provision of long term care services. In this provision, the independent sector, which is composed by those providers whose services are contracted by the NHS but their services are not owned or managed by the NHS, plays a major role. Forder and Allan (2011), estimate that about a 90% of the provision for older people[3] was actually responsibility of the independent sector. Within this sector, the *for-profit* private sector dominates the provision accumulating the majority of providers - about the 84%.

There are various types of private providers depending on their size - e.g. the number of beds they have and their distribution is quite unbalanced. Jarrett (2016) argues that about the 15% of market share is concentrated in 4 "main providers" and the remaining 70% of the market share is composed by providers that have a reduced number of beds - no more than 0.4% of the beds each. Despite this polarisation within the private sector, the care homes market presents a high level of competitiveness overall. Alike the distribution of planning regulations, this competitiveness, is also subject to significant discrepancies across different local authorities in England (Allan and Forder, 2012)[4]

An underlying characteristic of the long term care market is associated with the types of demand that providers face. In addition to publicly funded clients, who undertake a means test in order to determine their eligibility for public support, there are also clients who self fund their care. Both types of clients purchase care distinctly and therefore are subject to two different market configurations. Hence, whereas self-funded clients purchase care normally according to market rules and their willingness to pay, the care of publicly funded clients is purchased through commissioners ultimately managed by the local authorities. The market for the latter adopts a form of quasi market where services obtain a source of public funding from the state and/or local authorities but the provision is totally delivered by private and independent providers which compete for

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[2]The Health and Social Care Act (2008) supposed the transfer of public health matters from Primary Care Trusts (PCT) to local authorities. Clinical issues were responsibility of the clinical commissioning groups (CCG).

[3]Older people is the main group that compose the demand for long term care services. However, care homes also provide services for other types of clients are young adults, people who have misused drugs.

[4]Considering registered care homes in all sectors, the South East is the region that has more registered care homes (currently more than 1,000). This proportion of care homes contrasts with the North East where there are about 360 registered care homes.

capturing those purchasers that are publicly supported Le Grand, 2012[5]. For the case of clients who receive public support, there are several issues to consider regarding the way their care, and therefore their provider, is chosen.

First, councils set a framework agreement where they establish their payment rates and their quality standards. These contracts are reviewed yearly considering the budgetary needs of the councils. Providers willing to provide services according to the conditions in the agreement apply for inclusion. Once there is a list with potential providers that are prepared to charge fees based on the council payment rate, commissioners negotiate and choose amongst them. The main driver of this choice is the fulfillment of the minimum quality standards. In some cases, local authorities carry out contracts in advance and block a number of places. Also, apart from allowing councils for acting on their behalf, clients who receive public support may choose personally their suitable accommodation among the locations included in the list. If the choice is not available, public clients can choose an alternative location provided that the accommodation meets the needs of the client and the cost is not greater than the councils expected cost for people with the same degree of assessed needs.

The proportion of people supported publicly varies notably across different local authorities in England. Whereas local authorities located in the south east have a 44% of the clients that are subsidized, other mostly located in the north east have almost an 80% of clients that receive public support. This different degree of public support may lead to diverse market unbalances. In some cases. comissioners are the core clientele that care homes have and therefore negotiate contracts for a number of beds. This situation gives them a purchasing power – monopsony - that leads to set prices below the equilibrium level.

The former situation entails distortions in both the demand and the supply side. The demand presents a cross-subsidisation of the services from the self-funded clients to the publicly-supported. Since providers offer the service with two different fees depending on who demands the service, *self-funded* clients must pay a premium to compenseate the discounts on the fees charged to public supported clients. Likewise, the supply side is also affected especially in the case of locations that rely notably on the clients that receive public support. In these cases, providers find greater hurdles to obtain enough margins to offset budgetary constraints. This situation may result in reductions on the quality of the services so that providers only meet the minimum standards required by the Care Quality Commission, reductions in the market entries or exits from the market (Allan and Forder, 2015)

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[5]**New paper on quasi markets**

2.2 Planning system in England

Planning systems are responsibility of district councils throughout the local planning authorities. These set out the strategic priorities for the areas throughout the Local Plans. These strategic priorities include the fulfilment of local needs at socio-economic, cultural, security and health level. The former entail the intervention of other relevant agents in addition to the local planning authorities. In order to promote the engagement and a shared decision making between both local planning authorities and other relevant parts since 2012 there is the National Planning Policy Framework. This is a framework that establishes a set of national planning policies in order to guide development decisions for meeting local needs. The health and social care are issues explicitly addressed by the National Planning Framework. Concretely this framework must enhance the collaboration between local planning authorities, public health authorities, commissioners and providers in order to promote healthy communities and analyse the implications of the development of health and social care infrastructures. The development of care homes constitutes then an element contained in the National Planning Framework.

Several authors have investigated the effects associated with the design of the planning system in England and the net effects of the land use regulation. The main conclusions derived from this research are essentially two. Firstly, planning regulations in England are generally more restrictive than similar regulations in other countries such as for instance Germany (Cheshire 2013). As noted by Hilber (2011), various factors have contributed notably to restrict the housing supply. These have included the implementation of green belts, the controls in the height of the properties and the lack of fiscal incentives for the development at local level. In addition to those, local governments have a discretionary power to control the development of certain projects which is normally linked to political considerations and which increment the rigidities. The consequences of these rigid regulations have caused housing shortfalls (Cheshire, 2009; Cheshire et al., 2014; **?**) and have translated into consistent increases in the house prices[6] Likewise, there has been a generalised up-ward trend in the volatility in the housing market (Cheshire (2013)). In any case, these analyses have not been focused just on the housing market. Conversely issues such as the losses of productivity in the retail sector (Cheshire et all, 2015) or the negative effects on small retailers derived from the creation of entry barriers to larger stores Sadun (2015).

Secondly, the level of regulatory tightness differs notably across English governments. Thus, local planning authorities where there are more affluent areas (specially

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[6]See see section 4 for further details of the effects of tight planning regulations on house prices.

areas located in the South East England) tend to be more restrictive since they are subject to greater incentives to restrict the development and protect landlords and homeowners willing and therefore exploit the likely increases the value of their assets.

3   Data and methods

The data corresponding to the sample of analysis in this paper cover years from 2011 to 2016 that we divide into three time intervals $t(t = 1, 2, 3)$ that include March 2011 – March 2013, March 2013 – March 2015 and March 2015 – September 2016. These data are retrieved from several sources and are referreed to 324 local planning authorities. We cluster our information at this level since these type of local authorities are likely to rule the housing planning policies and then determine the house prices. Therefore we assume that each of those represents a local market and a unit for the analysis.

Care homes

The information concerning the characteristics and dynamics of the care homes is obtained from the Care Quality Commission (CQC) directory of active and inactive care homes. Our main interest consists of studying the effect of prices on the proportion of care homes in a local market. In the spirit of Tokunaga and Hashimoto (2013), who analyse the choice local markets by private long term care providers in Japan, we represent this proportion as the number of care homes per 1000 population in the local authority that are aged 65 or over. This dataset contains all the registrations of care homes that have carried out a regulated activity since 2010. The initial sample includes 24,354 records. Our analysis is restricted to the entries from March 2011 onwards since a substantive proportion of the total registrations (16,054) were carried out during 2010 and the first two first months of 2011 as a result of a new regulation.[7] As we illustrate in Figure 1, this process was prolonged for the remaining months of 2011 particularly until July. The forthcoming years presented progressively a less intense level of registrations.

A major strength of this dataset for the purposes of this research consists of the opportunity to track the entries and exits of the care homes in the market. Concretely, this dataset records the date when each care home has been registered and deregistered (in case it has done so) in the CQC. Besides, it provides further individual information regarding the care homes that includes the number of beds in the care home, the identifier

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[7]Since October 2010 registration in Care Quality Commission became a legal requirement for every long term care provider who wanted to carry out a regulated activity.
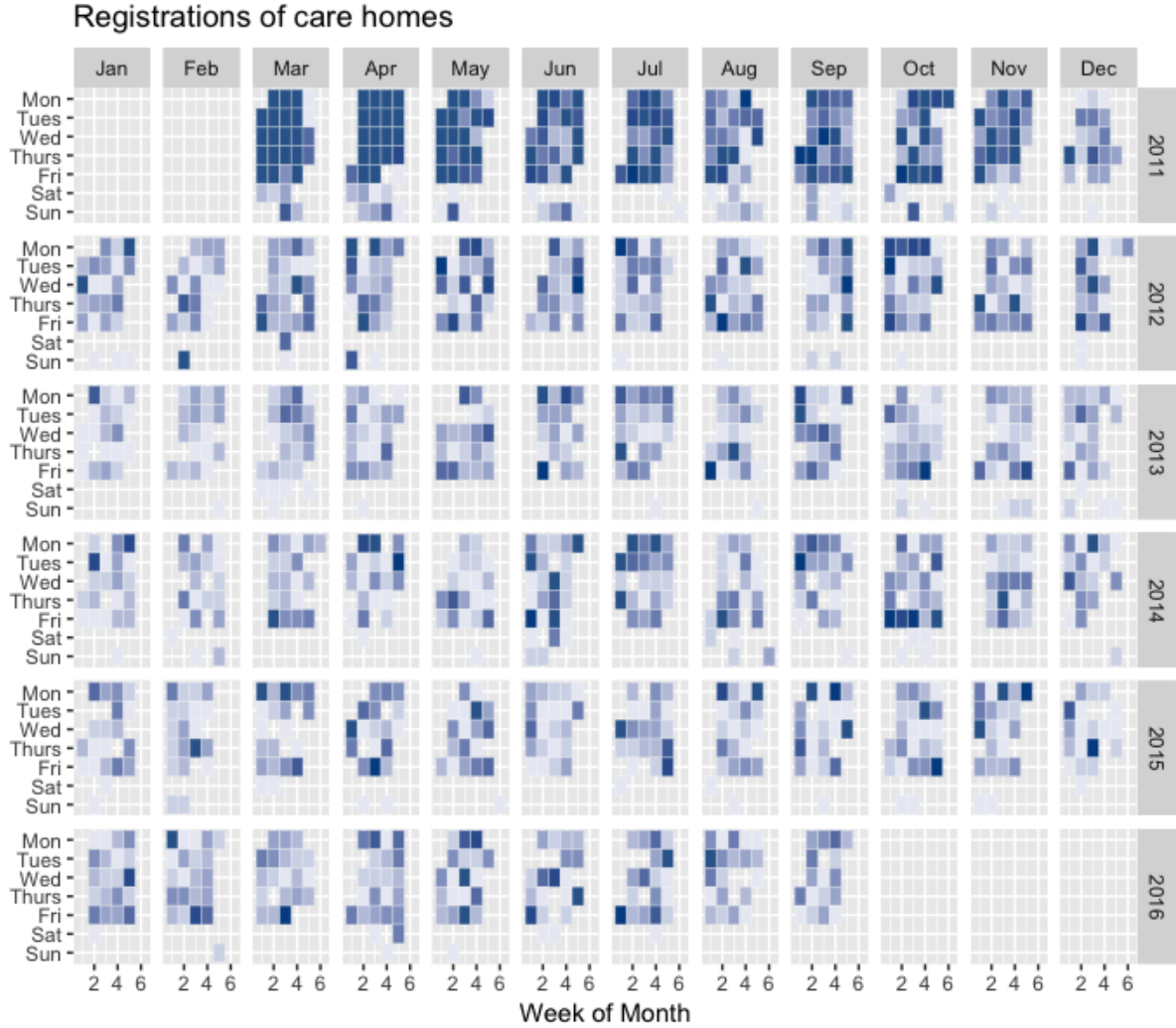
Figure 1: Care homes registrations in the CQC (2011- 2016)

code, the name of the care home, the postcode and postal address, the city and region where the care home is located as well as the local authority responsible for the social care activities corresponding to the location of the care home. Likewise, with the exception of the number of beds, the same information is available with regards to the providers where the care homes belong to. We geocode all our observations in order to facilitiate the linkage with other datasets. Given that we do not have any further information available, we assume that care homes choose and stay in a market since the date of their registration. Analogously, we consider that a care home exits the market in the date that it is deregistered.

Considering the former, a general approach to calculate the proportion of care homes that are in the market consists of comparing the identification codes and dates of regis-

tration and deregistration. Then we can count the number of care homes that effectively remain during each period of time. However, given the characteristics this administrative data from CQC it is necessary to stress an analytical caveat associated with the measurement of entries in the market. Concretely, it is important to differentiate those entries that correspond to *de novo entrants* –i.e. entries corresponding to firms that produce a new activity, from those that may be spurious referred to incumbent firms in the market and which are the result of change in the organizational structure or in the identification code. In our sample there are care homes that have been subject to modifications that include, changes in the address or take overs from a different provider. These changes are reflected in the registry with a change in the identification code. It is necessary to address these issues since neglecting them may hamper the results with regards to the market dynamics as well as bias subsequent conclusions at corporate level. Geurts and Van Biesebroeck (2016), for instance, analyse the effect of this measurement problem on the estimations of the firm's growth after the entry in the market.[8]

Likewise, in a second stage of our analysis we use information corresponding to quality ratings. These are based on the system of inspections implemented by the CQC since 2014. On the basis of five dimensions[9], this new approach set a systematic method for collecting evidence that enables a more consistent assessment and comparison of the care homes' performance. Services are rated according to four categories: *outstanding*, *good*, *requires improvement or inadequate*. For our analysis we collapse these categories into two: bad (requires improvement and inadequate) and good (outstanding and good). Because the information is only available since October 2014, this part of the analysis considers a different timeframe that involves three waves from October 2014 - May 2015, May 2015 – February 2016 and February 2016 – September 2016.

House prices

The information corresponding to prices of the properties is obtained from the price paid dataset released on a monthly basis by the Land Registry. This dataset contains all the transactions of properties carried out in England and Wales since 1995. In addition to the price paid for the transaction, the dataset includes further information such as the type of property, the address, the city, district and region where the property is located as well as other information such as whether it is newly built and whether the property is under leasehold or freehold. The information regarding the transactions is collected on a

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[8]In the Appendix 5 we present further details about the computation of this variable

[9]These dimensions entail the evaluation of issues related to the safety, the effectivity, the level of care and response to people's needs as well as the management of the services.

daily basis we are able to subset the information according to the pre-defined periods of analysis. Then we group transactions that belong to the same planning authority and retrieve the average price of them. The final output consists of an average price for each local planning authority for each period. Prior to calculating the average prices, we geocode the transactions with the information of the postal code directory of the Office of National Statistics ONS (2016). We employ these geographical codes as key variables to match the information of house prices and the characteristics of the care homes.

Instruments

Inspired by Hilber and Vermeulen (2016), our identification strategy exploits the changes in the restrictiveness of the planning regulations. This variable is built considering a series of historical planning applications from the Department of Communities and Local Government (DCLG) since 1978 and it is defined as the refusal of 10 dwellings or more per year. This variable is built considering information regarding planning applications from the Department of Communities and Local Government (DCLG) and it is defined as the refusal of 10 dwellings or more per year. As we shall explain in further detail below, this measure may be subject to endogeneity concerns. In order to correct for these potential limitations, we use an alternative measure of planning regulations, the rate in change of delay of major projects which is also obtained from the DCLG. We also use the variation in the historical political composition of the local authorities. Using data from the British Election Studies Information System, we capture a series of the historical Labour vote share at the General Election since 1983.

3.1   Econometric framework

Our purpose is to test the effect of the house prices on the proportion of care homes in local long term care markets. Considering a local authority i during a time period t, the proportion of care homes C can be estimated with a simple regression model specified as follows

$$C_{it} = \beta X_{it} + \alpha P_{it} + \psi_i + \epsilon_{it} \tag{1}$$

where X_{it} represents a vector with different observable variables that characterize the composition of local long term care markets and that we use as controls. Hence, on the one hand we define the demand for long term care in the local market by addressing a number of issues. Firstly, we include the proportion of people older than 85 and

proportion of people that receive the attendance allowance[10] as proxies of the level of health dependency. Also, given the association between the financial needs and the funding support determined by the means-test, we incorporate the proportion of people that receive some sort of income support and the proportion of people that receive pension credits to reflect the payer composition within the local population. These variables have been previously used in the literature for these purposes (Darton et al., 2010; Forder and Allan, 2014). Likewise, given that long term care is a labour intense activity, we add the proportion of females that claim for job seekers' allowance in order to get a proxy for unemployment. The information associated with this set of observable variables are extracted from the Department of Work and Pensions.

In addition to the former, X also includes a measure of the Herfindahl–Hirschman Index (HHI) to control for the competition between care homes in the local market. In our case, the HHI is a measure of concentration that reflects the squared shares of beds across all the providers in a local market. The values range from 0 to 1 where higher values represent higher concentration and therefore less competition.

P_{it} is the average of the house prices and ϵ represents an error term that is identically and independtly distributed. In this specification α is the parameter of interest and thus is interpreted as the impact of house prices on the proportion of care homes. Equation 1 can be estimated by OLS and will produce an unbiased estimate of α only if is exogenous so that $Cov(X_i, \epsilon_i)$. In case this occurs, this estimate may be effectively interpreted as a causal effect.

As we argue below, there may be elements that violate the former and introduce correlation between P_{it} and ϵ_{it} resulting in biased estimates of α. We address this concern by using an instrumental variables (IV) approach and estimating the two-least squares estimator of α. We provide details of this strategy in the following subsection

3.2 Bias and specification

A potential element that can lead to inconsistent estimations of α may be the presence of unobserved variables that affect both house prices and proportion of care homes. For example, one may think about the effect of unobserved incomes that may affect positively the values of the properties and also incentivise the entries in the market given likely wealth effects. Hence, higher level of housing prices may result in wealth effects that lead to greater levels of consumption and then attract businesses. Hence the selection

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[10]This benefit aims to support those people with physical disabilities in UK that live independently and might require residential care services otherwise.

of an area by a care home provider is likely to be non-random and. In order to tackle with these potential problems, it is necessary to find an instrumental variable z that is uncorrelated with ϵ but is correlated with P

Our identification strategy for meeting this purpose is inspired on Hilber and Vermeulen (2016) The underlying idea of their strategy is based on exploiting the variability in the level of restrictiveness associated with planning regulations across UK planning authorities for analysing the effects of local earnings on house prices. Their findings confirm the vision that tight supply regimes – e.g. with more regulatory constraints in the planning regulations, lead to increases in the prices. In our case, we apply directly the planning regulation instruments to the house prices. For our identification we assume that this instrument, in addition of being correlated with local earnings as shown in Hilber and Vermeulen (2016), is also correlated with the house prices.

Both the relationship between planning regulations and house prices as well as the use of planning regulations for addressing endogeneity bias associated with house prices have been well documented in the literature. Considering the case of UK, several authors have shed light with regards to the effects of tight planning regulations on house prices suggesting a positive relationship (see for example Bramley (1998); Barker et al. (2004); Hilber and Vermeulen (2016) Bramley (1998), Cheshire and Sheppard (1989, 2002), Barker (2004,2006), Cheshire and Hilber (2008) or Hilber and Vermeulen (2016)). The level of tightness of a local planning authority can be expressed in terms of the number of big "major" residential projects that are refused every year.

The results of Table 2 suggest that those local planning authorities that are more restrictive with the acceptance of major project tend to have higher prices in their housing market. The use of the refusal rate could be considered as valid instrument for overcoming the endogeneity in house prices. However, as Hilber and Vermeulen (2016) and Hilber (2015) argue, there some empirical concerns that have to be taken into account when using the refusal rates as instrument. First, this variable is pro-cyclical so times with greater housing demand are linked to more regulatory restrictions. Thereby, the combination of these two elements may lead to greater increases of the house prices. This problem can be addressed easily by using the average refusal rate.

Yet there is a remaining problem concerning the way developers perceive the planning regulations. One may question whether the behaviour of developers is modified when they are aware of the level of tightness of certain local planning authorities are tighter than others. It may happen that if they know that some local planning authorities are particularly restrictive they may deter their applications and focus on other markets. If this occurs, then the observed refusal rates may not reflect the level of real restrictiveness,

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especially in the cases of more limiting local planning authorities. For coping with this limitation it is possible to exploit two identification strategies on the basis of Hilber and Vermeulen (2016).

The first involves a planning reform aimed at speeding up the planning processes and the second links the planning regulations and the variation in the share of local political power. The main idea corresponding to the identification strategy based on the planning reform consists of exploiting the variation in the change in the delay rates before and after the reform. Set in 2002, the reform included the establishment of an explicit goal for major development projects. The main purpose of this target was to avoid the delays of major projects by local planning authorities. Despite they were not formally penalised for not meeting the target, local planning authorities did not have the incentive for neglecting the target either. The central government could retain financial resources addressed to local planning authorities. An option for local authorities to meet the target was to refuse greater projects and conversely approve smaller projects which could be finished on time.

On the basis of the former, it is possible to think on the behaviour of the local planning authorities before and after the reform paying particular attention to their level of restrictiveness. Thus, before the reform local planning authorities that were more restrictive would be also the ones that had greater delays and thereby the least likely to meet the target. Once the reform was established, these local planning authorities would be also the ones more likely to refuse more projects and therefore suffer less delays. Less restrictive local planning would not have to alter their behaviour substantially. Considering this, we allow for a 10-year period to represent the average delay rates pre and post reform. Hence we consider the delay rates 1994 and 1996 and the delay rates between 2004-2006.

Regarding the relationship of political power and the application of local planning regulations we take advantage of the variation in the political composition of the local council. In addition to Hilber and Vermeulen (2016), this strategy has been used by other authors such Bertrand and Kramarz (2002), Sadun (2015) or Cheshire et al (2016). Hence, we use the share of Labour party votes at the General Election of 1983. The information is obtained from the British Election Studies Information System. We choose the share of Labour voters since we believe that the attitudes of these voters will be more inclined to grant house access rather than to preserve the value of the properties. Also, we could have used the results derived from local elections. Yet, these might be correlated with the development of local housing markets and constitute a source of potential bias. The time frame of 1983 provides the earliest date where election results can be linked to data

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corresponding to local authorities and then minimizes the potential association between the outcome of the election and the planning process.

Considering these caveats, we specify 2 in order to estimate first-stage fitted values of the log house prices. The predicted values derived from this equation are used as instruments and incorporated in 1in order to get a consistent estimate of α.

$$P_{it} = \delta Z_{it} + X \kappa_{it} + u_{it} \tag{2}$$

where Z are a set of observables that will be used as instruments. For the reasons discussed above, we employ the share of Labour voters and the changes in delay rates pre and post reform. X incorporates the same set of market controls included in 1.

3.3 Descriptive statistics

In Table 1 we summarise the main descriptive statistics for the variables of interest in our estimation sample. The information is presented at the level of local planning authorities and we also include the sources of information employed. On average, over the period of analysis (March 2013 – September 2016) there were about 1.7 care homes per 1000 population over 1000. Yet, this proportion varied notably across the different local planning authorities where some present less than 1 (0.4) care homes per 1000 population and some others more than 3.5 up to a maximum of 4.06. Other variables in Table 1 also reflect this local variation in the market for long term care. Interestingly there is a planning authority that registers a maximum average value for the houses of £2,170,757. Apart from this outlier, the average house prices are £267,014.

As can be noted from Table 1, there are less observations associated with the information corresponding to the instrumental variables. This is because in 2010 there were certain Local Planning Authorities that were reformed and divided into new authorities. We are unable to retrieve and match the information corresponding to these new authorities and therefore we drop then from the sample. In the next section we provide further details referred to the variables employed for our instrumental variables approach.

Furthermore, Figure 2 shows the geographical distribution of entries across the local planning authorities considered in the analysis and provides further descriptive evidence that confirms the geographical differences with regards to entry and distribution of care homes in the long term care market. As can be noticed the highest entries tend to accumulate in the South east of and the local authorities around London.

Figure 2 plots the evolution on time the house prices across different regions in England.
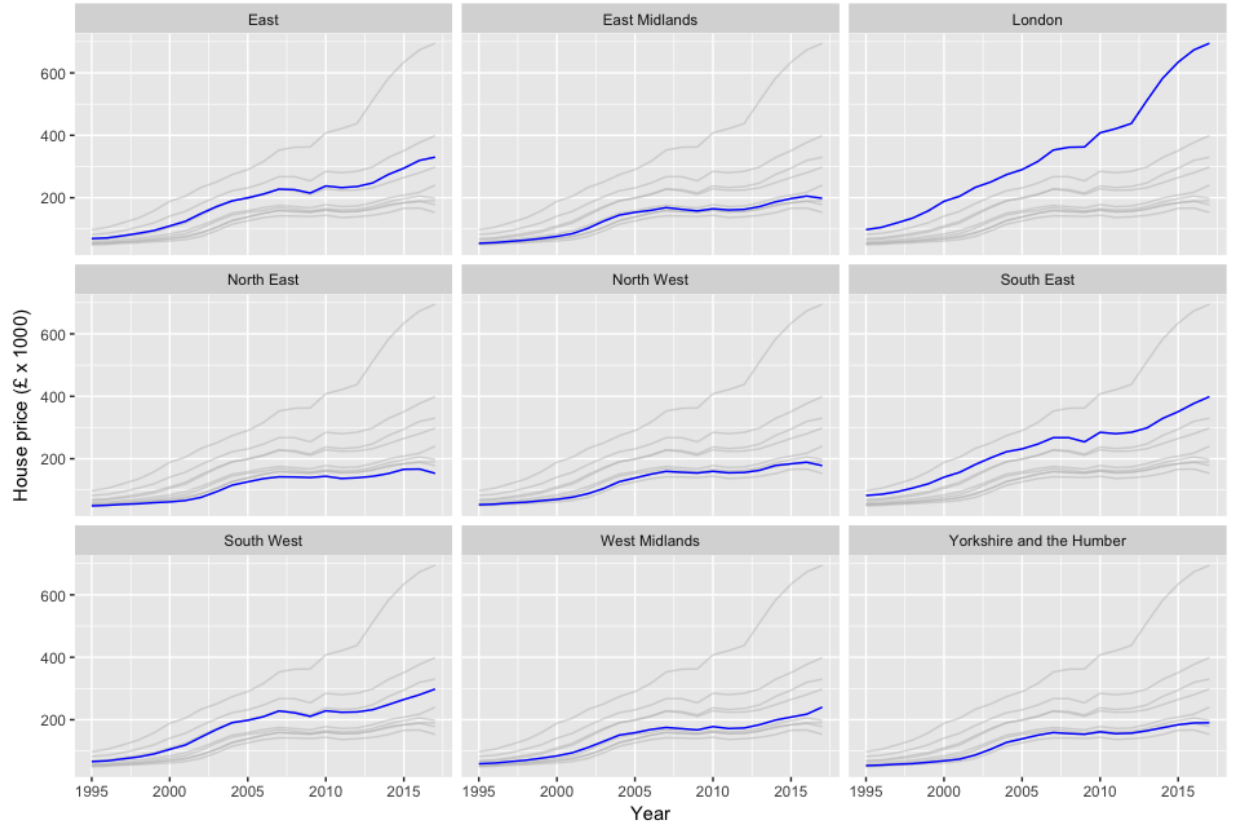
Figure 2: House prices in England, 1995-2017

3.4 Prices and planning regulations

Table 3 shows evidence on the validity of the instruments conidered. The two columns reflect estimates from regressions regarding **??**with and without market controls respectively. If we consider the institutional mechanisms described in the former section, we we would expect that higher prices are associated also with tighter regulations. The results suggest a significant correlation between the house prices and all the instruments that we are proposing for both cases. The estimates also show the expected signs. Hence, the greater changes in the delay rates pre and post reform influence negatively the prices. Big differences imply reductions in the rate of delay for restrictive local authorities. These improvements are substituted with more rejections of the major projects and therefore greater refusal rates. As we showed in Table 2 this variable is possitively associated with the house prices. Likewise, the share of labour voters is also associated with lower levels in the house prices.

The results in table 1 show the predicted relationship between the house prices and the instruments proposed in (Hilber and Vermeulen, 2016). Prices in those planning

Table 1: First stage results, dependent variable house prices (log)

	Refusal rate	Change rate of delay	Share votes of Labour
House prices	1.222***	-0.095	-1.672***
	(0.2802)	(0.06)	(0.328)
Observations	945	945	945
R2	0.694		
Residual Std. Error	0.279		
F Statistic	52.25***		
Cragg-Donald Wald F statistic		4.56	70.96
Kleibergen-Paap Wald rk F statistic		2.07	26.04

Notes: Market controls: Share of people 85+, Share of people receiving Attendance Allowance, Share of people with pension credits, Share of females claiming for Job Seekers Allowance, Share of adults with income support and Herfindahl-Hirschmann Index. Robust standard errors in parentheses. Standard errors are clustered at local planning authority level. ***/**/*/+ denote significance levels at 1%, 5%, 10% and 15%. Standard errors are presented in parentheses.

authorities that are more restrictive and thus register higher refusal rates, present a positive association with house prices. Likewise, as Hilber and Vermeulen (2016) indicate, the refusal rate may be subject to endogeneity concerns.

This association is also reflected in figure 1 where we show further evidence on the validity of the instruments.

4 Results

4.1 House prices and market entries

Table 4 presents the main results derived from the estimation regarding the impact of house prices on the proportion of care homes based on the second stage of our specification in (1). The results in first three columns report the results associated with OLS estimates and indicate that the entries of care homes in the market are adversely affected by the level of prices in the housing market with the planning authority. This negative effect persists when we control for the observable characteristics of the market and also control for county unobserved characteristics. Indeed, the greater impact of an increase of 10% in the level of house prices leads to a decrease of 0.035 in the number of care homes per 1000 population older than 65. This occurs when we include both market and region controls in our estimation. When we only consider market controls a similar effect leads to a decrease of 0.019 care homes which is not significant. The significant estimates when we include the county controls suggest that there may be some unobserved variables that

may bias the coefficient estimates regarding house prices.

Table 2: Second stage results, effects of house prices on care homes entry

	Care homes per 1000 people over 65			
	OLS	IV	OLS	IV
Average house prices (log)	-0.111	0.846*		
	(0 .128)	(0.329)		
Average lagged house prices (log)			-0.132	0.863**
			(0.127)	(0.33)
Observations	945	945	945	945
R2		0.1406		
F statistic	17.02***		16.53***	
Cragg-Donald Wald F statistic		70.96		72.86
Kleibergen-Paap rk Wald F statistic		26.04		29.12

Notes: Market controls: Share of people 85+, Share of people receiving Attendance Allowance, Share of people with pension credits, Share of females claiming for Job Seekers Allowance, Share of adults with income support and Herfindahl-Hirschmann Index. Robust standard errors in parentheses. Standard errors are clustered at local planning authority level. ***/**/*/+ denote significance levels at 1%, 5%, 10% and 15%. Standard errors are presented in parentheses.

The former estimates consider house prices as exogenous. However, as it has been discussed before, prices are subject to endogeneity concerns. Columns 4 to 9 show results where prices are treated as endogenous. Hence, columns 4 to 6 correspond to IV estimates incorporate the share of labour voters and columns 7 – 9 include the changes in the rate of delay pre and post reform respectively. As occurs with the OLS estimates, both IV regressions report results with and without market and county level controls respectively. For assessing the validity and consistency of both instruments we carry out Wald and Wu Hausman tests respectively. The results of these tests are displayed in the lower part of table 2. When we account for endogenity in our specifications, the structure of the market for care homes seems to respond significantly to the differences in the local housing markets. Nonetheless our results suggest now a different story with house prices affecting positively the entry of care homes given by proportion of care homes in the local market. Hence, the effect of house prices on care homes entries shows a positive effect which generally is greater than the OLS estimates for the cases of market and country controls. The most important impact of a 10% increase in the house prices corresponds to an increase of 0.21 in the number of care homes. This estimate, which is highly significant

at lower level than 1%, is obtained by using the share of labour voters as the instrument and controlling for both market variables and county levels (column 6). Alternatively, when we control only for the market variable, we find that increases of 10% in the house prices lead to significant increases of 0.11 in the number of care homes.

The Wald statistic indicates validity of the share of Labour voters as an instrument for the house prices in both the cases with and without controls. Likewise, the Wu-Hausman statistic suggests the rejection of the null hypothesis of exogeneity in the house prices and therefore confirms the existence of endogeneity. Similarly, the rate of delay pre and post reform is also a valid instrument according to the Wald statistic when controlling for market characteristics or neglecting controls. However, the estimates of the house prices instrumented by the rate of delay are less efficient than OLS estimates. The estimates of the Wu-Hausman estimates do not allow to reject the exogeneity in the house prices.

Also it is not possible to establish a clear conclusion regarding the effect of house prices given the results associated with the rates of delay pre and post-reform. Whereas this impact on the proportion of care homes is positive when we control only for market variables, it turns to be negative when we apply controls regarding region levels or no controls. Furthermore, in any of the cases these effects are not significant.

In general, these findings suggest that providers would be focusing on more affluent areas possibly aiming at securing potential clients that do not rely on public funding arrangements. A reason for this may be the aim of providers for minimizing the effect derived from the existing cross-subsidisation from self-funded to publicly funded clients. Humphries et al. (2016) argue that this strategy has been followed by a number of long term care providers.

Robustness checks

In order to test the robustness of our results, we run various models. Firstly, a plausible concern may be the presence of some outliers in the distribution of care homes. In order to overcome the potential influence of these observations we remove from the sample the top and bottom 5% of care homes by 1000 population over 65. We also consider a sample without the planning authorities belonging to the region of London. The results of these analyses are shown in Table 7. It is important to highlight that the specifications corresponding to each of the columns are identical to the specifications presented in Table 3.

The results from Table 3 are in general on the same lines as the results in Table 2.

Table 3: Robustness checks, care homes without London region and

	London excluded				Top and bottom 5% excluded			
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
House price	-0.21	1.612+			0.148**	0.844**	0.125	
	(0.154)	(0.998)			(0.075)	(0.291)	(0.076)	
Lagged house price			-0.206	1.473*				0.857**
			(0.150)	(0.86)				(0.29)
Observations	849	849	849	849	841	841	841	841
R2	0.378	0.114	0.378	0.141	0.345	0.192	0.342	0.185
F statistic	15.31***		14.93***	11.43***	15.2***	11.69***	15.02***	12.03***
Cragg-Donald Wald F statistic		25.207		28.677		74.324		77.821
Kleibergen-Paap rk Wald F statistic		11.156		13.887		22.603		25.896

Notes: Market controls: Share of people 85+, Share of people receiving Attendance Allowance, Share of people with pension credits, Share of females claiming for Job Seekers Allowance, Share of adults with income support and Herfindahl-Hirschmann Index. Robust standard errors in parentheses. Standard errors are clustered at local planning authority level. ***/**/*/+ denote significance levels at 1%, 5%, 10% and 15%. Standard errors are presented in parentheses.

4.2 Exploration of further channels

Effect on the social care expenditure

The positive effect of prices may be indicate a transfer of the demand. In Table 4 we show the effect on the level of per capita expenditure in residential care.

The effect of the prices in terms of the expenditure is how it would be expected. Higher houses reduce the levels of public expenditure on residential care. This effect is nonetheless very significant. An explanation may be derived from the fact that areas with higher prices may have less people that are likely to receive these funds.

Effect on the distribution of care homes per level of quality

An alternative channel can be the distribution of care homes by their level of quality. In 5 we show the resuls derived from the effect of house prices . We can see that the effects are to greater extent more pronounced in the case of care homes of better quality. In any case these effects are not significant.

When we control for endogeneity using the rate of delay as instrument for prices, contrary to the Labour share, the effects of the prices on the care homes entry are generally negative. The only significant effect corresponds to the entry care homes classified as good and only when market controls are applied. It is also in this case, in addition to the case of no controls, when we should consider the delay rate as instrument for endogeneity. When we apply county controls.

Table 4: Second stage results, effects on per capita expenditures

	Per capita expenditure on residential care			
	OLS	IV	OLS	IV
Average house prices (log)	-0.153	-0.725^{+}		
	(0.122)	(0.483)		
Average lagged house prices (log)			-0.197	-0.74^{+}
			(0.128)	(0.484)
Observations	945	945	945	945
R2	0.8604			
F statistic	103.88***		103.59***	
Cragg-Donald Wald F statistic		70.959		72.864
Kleibergen-Paap rk Wald F statistic		26.039		29.122

Notes: Market controls: Share of people 85+, Share of people receiving Attendance Allowance, Share of people with pension credits, Share of females claiming for Job Seekers Allowance, Share of adults with income support and Herfindahl-Hirschmann Index. Robust standard errors in parentheses. Standard errors are clustered at local planning authority level. ***/**/*/+ denote significance levels at 1%, 5%, 10% and 15%. Standard errors are presented in parentheses.

5 Conclusion

In this study we have investigated whether the high prices in the English housing market respresent a barrier to the provision of long term care services or contrarily they provide an incentive for care homes to set their services. First, we test for simple OLS regression and we show that there are empirical constraints that produce biased estimates. Consequently we address these concerns by considering different variables associated with planning regulations to instrument the house prices. According to our findings, the use of the share of political power performs as a better instrument for addressing potential endogeneity concerns related to house prices.

The results then suggest that house prices are positively associated with the entries and providers might therefore be driven to set their businesses in places where the prices of the properties higher. We explore the underlying mechanism of this effect by examining how house prices affect the number of care homes according to their quality rating. In sum, the positive effect of house prices on the entry of care homes is greater in cases where care homes have a better overall rating. A further avenue for this research could consider each of the dimensions involved in the quality inspections.

Our results also point out at the connection between the housing market and the

Table 5: Second stage results, effects on distribution of care homes by quality

	Good quality care homes				Bad quality care homes			
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
House prices	0.144*	0.189			0.06**	0.02		
	(0.086)	(0.24)			(0.018)	(0.06)		
Lagged House prices			0.138+	0.193			0.04*	0.02
			(0.09)	(0.246)			(0.02)	(0.061)
Observations	945	945	945	945	945		945	
R2	0.2942		0.2936		0.4379		0.432	
F statistic	12.34***		11.91***		21.25***		20.72***	
Cragg-Donald Wald F statistic		70.959		72.864		70.959		72.864
Kleibergen-Paap rk Wald F statistic		26.039		29.122		26.039		29.122

Notes: Market controls: Share of people 85+, Share of people receiving Attendance Allowance, Share of people with pension credits, Share of females claiming for Job Seekers Allowance, Share of adults with income support and Herfindahl-Hirschmann Index. Robust standard errors in parentheses. Standard errors are clustered at local planning authority level. ***/**/*/+ denote significance levels at 1%, 5%, 10% and 15%. Standard errors are presented in parentheses.

market of long term care activities. The coordination between local authorities at both county and district level is therefore encouraged to facilitate the provision of further evidence about the relationships between both types of markets.

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Appendix

This appendix provides details on the various sources of data used as well as the computation of variables used in our empirical analysis.

Market entries

For distinguishing de novo entries we firstly identify those postcodes that are repeated given that they may potentially contain spurious entries. Then, we compare the dates of registration, the identification code and the number of beds corresponding to each observation (care home) in order to identify those observations that effectively can be classified as a new entry in the market. Analogously, we follow a similar process for calculating the definite exits in the market. Concretely, after casting those care homes with duplicated postcodes that report a date of deregistration[11] we compare identification codes and number of beds to define the last date as a definite exit. Considering the former we can calculate the cumulative number of care homes for each wave and calculate the proportion of care homes for each 1000 inhabitants older than 65.

5.1 Geographical information

We attach several geographical information to the postcodes that we obtain from the postcode directory released by the Office of National Statistics (ONS, 2016). Apart from arranging observations in terms of our unit of analysis, the local planning authorities, the underlying idea of incorporating this geographical information is to have a set of key variables that we can use for merging other data.

Expenditures on social care

We extract this information from the different datsets available for creating the reports of Personal Social Services: Expenditure and Unit Costs, England. These reports are created on an annual basis and summarise the levels of expenditure on social care activities at council level. They are released by the NHS Digital[12] (formerly the HSCIC). For our analysis we select the information corresponding to the years 2011/12 - 2015/16. For representing the level of public expenditure we use the gross current expenditure. This is a well established fiscal measure of government spending and it represents the

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[11]If the care home remains active, the observation corresponding to the date of deregistration is reported as missing.

[12]Further details may be found in https://www.digital.nhs.uk/article/219/What-is-NHS-Digital-

expenditure that is not offset by income from clients and does not include capital charges either.[13]

In our analysis, we consider the spending devoted to residential care for indiviuals who were 65 or older. The types of support on these individuals include physical support, sensory support, support with memory and cognition, learning disability support and mental health support.

Election data

We use two sources for obtaining the historical information corresponding to the British election results. The information that spans from 1983 to 2008 us obtained from the British Center of Studies and is the information that we use for our instrument. It aims at providing the historical profile of the electorate of the local authorities. Likewise we control for the rate of Labour voters from the last election available (June 2015). This information is obtained from the data platform[14]

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[13]Gross current expenditure G is calculated as: $G = T - C$ where T is Gross Total Expenditure and C incorporates capital charges. Likewise, T is obtained from deducting incomes from joint arrangments I, the NHS N and other incomes O to the total expenditure E, $T = E - (I + N + O)$

[14]See for further information