

Cheshire, Paul; Dericks, Gerard

Conference Paper

Regulation, Rents and "Iconic Design": rent acquisition by design in the tightly constrained London office market

53rd Congress of the European Regional Science Association: "Regional Integration: Europe, the Mediterranean and the World Economy", 27-31 August 2013, Palermo, Italy

Provided in Cooperation with:

European Regional Science Association (ERSA)

Suggested Citation: Cheshire, Paul; Dericks, Gerard (2013) : Regulation, Rents and "Iconic Design": rent acquisition by design in the tightly constrained London office market, 53rd Congress of the European Regional Science Association: "Regional Integration: Europe, the Mediterranean and the World Economy", 27-31 August 2013, Palermo, Italy, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at:

<https://hdl.handle.net/10419/124102>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Preliminary Draft v02

[please do not quote without authors' permission]

Regulation, Rents and 'Iconic Design': rent acquisition by design in the tightly constrained London office market

Paul Cheshire and Gerard Dericks III, London School of Economics

Abstract

A 2008 paper investigating the Regulatory Tax (RT) on office development in Britain (Cheshire & Hilber, 2008) provided evidence of very tight restrictions on office space going back at least 50 years. It was also argued that the RT measure tended to underestimate the full costs of restrictive land use regulation since compliance costs would be underestimated. One form of compliance cost could be rent seeking by employing 'expensive design and a trophy architect' to get 'more rentable space per unit area of the site'. This paper finds evidence strongly supportive of this hypothesis and then values the contribution of famous architects to flexing one of the most restrictive planning systems in the world. It uses a sample of transactions in London offices sold between 2000 and 2011 courtesy of the Estates Gazette and Real Capital Analytics supplemented with GIS and building specific data. Trophy architects are identified as those who have won a prize from one of the three major architectural bodies. We employ a hedonic approach and show that i) given the site size a building designed by a trophy architect is more valuable than one designed by a regular architect, but that ii) this arises because such buildings do indeed squeeze more space on a given sized site than those designed by ordinary architects; however iii) the price per m² of a trophy architect's building is no greater; that iv) the value of a trophy architect has emerged since 1956 and v) buildings designed by trophy architects predating the introduction of the current planning system are less valuable for a given site.

JEL classification: H3, J6, Q15, R52.

Keywords: Land use regulation, regulatory costs, rent seeking, office markets.



February 2013

Corresponding author:

Paul Cheshire

Dept of Geography & Environment

London School of Economics

Houghton St

London WC2A 2AE, U.K.

p.cheshire@lse.ac.uk

Regulation, Rents and 'Iconic Design': rent acquisition by design in the tightly constrained London office market

Paul Cheshire and Gerard Dericks III, London School of Economics

[the Minister]... " will only approve skyscrapers of exceptional design. For a building of this size to be acceptable, the quality of its design is critical... the proposed tower is of highest architectural quality"
(John Prescott 2003)

1. Introduction

An increasing volume of literature demonstrates that British land markets, and especially those in England, are some of the most tightly regulated in the developed world (Cheshire and Sheppard, 2002, 2005; Evans and Hartwich, 2005; Cheshire and Hilber, 2008; Hilber and Vermeulen, 2012, Cheshire *et al* 2010; 2012). Land supply for urban development has been tightly constrained since 1947 and supply for each legal category of use is separately regulated. This is in a context in which local communities are in effect fined for permitting any commercial development and receive no fiscal reward for allowing residential development. It is regulated by a system so complex it is an effective barrier to entry for non-British developers and generates economies of scale such that it penalises smaller developers. It is, moreover, representative of a system in which all decisions about significant development proposals are subject to individual decision by a political process leading to uncertain outcomes and lengthy bargaining (Mayo and Sheppard, 2001; Ball et al, 2010).

Given such a system it was not surprising that Cheshire and Hilber (2008) found the regulatory burden on office development in London was the highest estimated for any significant office centre in Western Europe. The measure used was the Regulatory Tax (RT) measured as the difference between the price of marginal office space and its marginal construction costs. Expressed as a percentage tax on marginal construction costs, over the period 1999-2005 in London's West End, the RT averaged 809 percent (Cheshire and Hilber 2008). In the economically depressed city of Birmingham, situated on a flat plain in England's midlands, the cost per m² of constructing office space was about half that in Manhattan in 2004: but at the same date office occupation costs in Birmingham were 44% higher than in Manhattan. Not surprisingly Cheshire and Hilber estimated an RT rate on offices in Birmingham averaging 250% over 1999-2005. No researcher has reported that regulatory restrictions in the US impose any RT on commercial development – usually attributed to the localised fiscal system that generates significant incentives for local communities to bid for commercial development, often by providing property tax exemptions. Cheshire and Hilber (2008) were able to provide persuasive evidence that regulatory restrictiveness was the main cause of the high values of RT observed in Britain although the change of business property taxes in 1990 from a partly local to a transparently national tax had also played a measurable part.

We have, therefore, good evidence that the system of land use regulation in Britain raises the price of land available for development (see Cheshire and Sheppard 2002 and 2005 for more detail on this in the residential sector) and creates very significant economic rents. As an example, if a landowner in many parts of south east England could obtain permission to convert a hectare of agricultural land to housing its price would rise from some £10 000 to £5-10 million overnight (VOA, 2012). In an influential paper Krueger (1974) pointed out that if regulatory restrictions create economic rents, people and economic agents will compete for them and compete in a variety of ways from outright illegality via, for example, bribery or extortion (think the privatisation of former Soviet industries) to various more gentle and legal ways.

Krueger's context was physical, quantitative restrictions on imports or exports via licensing systems in developing countries. Whatever form the competition for such licenses took, however, she further

demonstrated the rent-seeking behaviour it induced represented a deadweight loss and the outcome was suboptimal in welfare terms. Specifically that quantitative restrictions not only led to an economy producing inside its transformation curve but that such quantitative restrictions, under all circumstances, led to an outcome which in welfare terms was worse than that associated with tariffs having an equivalent impact on trade.

Krueger's model translates almost precisely into the context of British land use planning. In Britain we impose very tight restrictions on quantities of land for every economic use but do not impose significant taxes. As Cheshire and Sheppard (2003) showed it is possible to restrict urban land take for residential use by i) direct quantitative controls; ii) taxing the development of 'greenfield' sites; or even iii) by taxing transport costs. Again, the conclusion was that if the goal was to restrict urban land take to any given level, doing so by imposing a tax on land consumption produced a superior welfare outcome to physical restriction via growth boundaries.

Despite the size of the economic rents potentially at stake, the British land use planning system appears to produce surprisingly few cases of proven corruption. The purpose of this paper is, however, to demonstrate that it does produce a more gentlemanly form of rent seeking behaviour on the part of developers: the employment of trophy architects to game the system and allow the developer to squeeze more lettable space onto a given site. We find that such trophy architects do this almost exclusively by being able to build taller; the footprints of their buildings are no bigger than would be expected. We further show that the ability to get more building on the site interacts with the restrictiveness of the planning system. Moreover it is not that the price per m² of space in trophy architect building is worth more: if anything it is worth less, certainly for older buildings. This may mainly reflect the greater likelihood of trophy architect buildings being selected for Conservation designation although the data hints at even modern buildings being less valuable per m².

We then compare the costs of trophy architects – they do not come cheap and in addition their building are more expensive per floor to build – with the value of the extra space they generate. We find that they can represent a profitable form of not just rent-seeking but rent-acquisition for the developer. Whether the conclusion from this is that it must imply a lower level of welfare to the community at large depends in part however on what social value – if any – trophy architect designed buildings generate. While there is evidence that housing designed by outstanding architects (Ahlfeldt and Maennig, 2010; Ahlfeldt and Mastro forthcoming) can generate values for surrounding residents as well, there is not as yet clear evidence that this is the case with commercial buildings although our data suggest that a concentration of Conservation Area and Listed buildings in the vicinity of any London office building does add to its value..

We use a data set of sales transactions for 387 individual office structures. Since some were transacted more than once we have observations on 513 sales. We defined 'trophy' architect designed buildings blind of the data and as objectively as possible: buildings designed by an architect who at the time of designing the building had already won a prize from one of the three major awarding bodies: the RIBA, AIA and the Pritzger Prize. While certainly giving a clear definition of 'trophy' architect it had the disadvantage that it restricted the number of such buildings to only 10. That the results are as significant as they turn out to be is perhaps surprising – one might even say re-inforces their credibility. We test for their robustness, however, by re-running the main models systematically dropping to tallest, two tallest and three tallest trophy architect buildings and find that results do not change in any significant way.

We start by showing that a trophy architect's building provides more floorspace on a given site all else equal but that this extra floorspace comes from building taller not from having a larger footprint to site ratio. We then analyse the impact of trophy architects' buildings in terms of their price per m² of built space and in terms of price per m² of site area. Finally, in Section 5, we compare the increase in the value

of the built space on a representative site in the City of London associated with a trophy architect to the costs employing a trophy architect imposes on a developer. We find that a trophy architect is likely to earn a handsome rent both for themselves and for the developer although this conclusion does assume that the planning outcome is certain when a trophy architect is employed – perhaps too strong.

2. The Planning System in London

England's planning system was very briefly outlined in the introduction¹. It rests on a process known as development control, exercised by the Local Planning Authority (LPA) which is the smallest governmental jurisdiction, typically a District or, in London, a Borough (although the Greater London Authority has some planning powers). There are 357 such LPAs in England. The framework and policies were established by the Town and Country Planning Act of 1947. This has been frequently added to and revised but to date always in ways which have tended to make it more, rather than less restrictive. The main aims are to:

1. Contain urban development with growth boundaries and Greenbelts. These Greenbelts cover an area some 1.5 times the total that of all urban areas in England;
2. Maintenance of green space within cities
3. Separation of conflicting uses (such as residential and industrial);
4. Require specific, legally defined, land use categories (such as retail, offices, light or heavy industry) to locate on particular sites or zones and allocate land and specific sites for those uses;
5. Since 1996 require 'traditional town centre uses' (especially retail) to develop on designated sites in town centres: out of town, large format retail development, including malls, has in effect been made impossible;
6. Restrict 'over-development' by means of 'plot ratios' – effectively Floor Area Ratios (FARs); despite this since about 1990 planning policies have increasingly aimed at -
7. Densification – by building at higher densities and by means of a target of at least 60% of new development taking place on 'brownfield' sites; this target has been exceeded;
8. Conservation of historic or interesting neighbourhoods or particular buildings either by means of 'Conservation Area' status - in which case there are stringent restrictions to any development which changes the external appearance of existing buildings and building taller than existing buildings becomes effectively impossible; or by 'Listing' a particular building in which case restrictions on change are even tighter, covering internal as well as external appearance and structure.

While planning policy as currently observed was effectively established in 1947, there were earlier planning provisions going back to the end of World War 1. In London there are particular provisions relevant to this paper. Height and building sizes became strictly regulated in London with the London Council Act of 1890. This set a statutory limit of 27m plus two-storeys in the roof (Inwood, 2005). This was shortly followed by the London Building Act of 1894, which restricted maximum building height to 24m to the roof cornice, with an additional 6m allowed for a recessed roof (Simon, 1996). These height limits were introduced on grounds of safety as a result of lobbying from the London Fire Brigade. Before about 1875 technology restricted building heights but the invention of lifts (elevators) and steel frames (see Turvey, 1998) allowed much taller buildings. London's fire fighters, however, successfully argued that since they did not have ladders long enough to reach such buildings they should be banned by means of height restrictions². Previous to these restrictions only technology and finance limited the development of tall structures. So neither skyscrapers – nor anything resembling skyscrapers - were built in London until

¹Planning in the three countries of Great Britain shares many features but there are specific differences, particularly in Scotland. There are also some particular features of planning in London, especially in the City of London and Docklands, discussed in the text

² Although the rumour was that Queen Victoria took against tall buildings after the construction of Queen Anne's Mansions in 1873 blocked her view of parliament from Buckingham Palace.

after 1956. Then the widespread use of fire lifts had made it impossible to continue to defend the antiquated height restrictions.

Plot ratios remained, however. These varied according to location. For most areas in London the plot-ratio restriction was 5:1, for central areas of the City, close to the Bank of England, the allowed ratio was 5½ :1; for other areas, deemed sensitive to increased density, the restriction was set at 2:1 (City of London, 2010). Thus it was not until the 1960s that any London building was built taller than St Pauls, completed in 1710, and to this day there are 8 protected sight corridors along which no building may be higher than the base of the dome of St Pauls (see Cheshire and Hilber, 2008).

To summarise, therefore, the planning and related policies that are strictly relevant for the analysis in this paper are:

1. Planning control by means of 'development control' whereby decisions to permit any legally defined development are discretionary and subject to appeal, rather than rule governed³;
2. Plot ratios to restrict the total floor area that can be developed on a site of a given size;
3. Binding height restriction for 'safety reasons' prior to 1956;
4. Binding height restrictions within 'Conservations Areas' and for listed buildings. [note there are areas of London, principally within Mayfair and Belgravia, in which most buildings are listed]

3. Data

Descriptive statistics are shown in Tables 1, 2a and 2b:

Table 1: Descriptive Statistics of Data used in Building Size Regressions

	N	Mean	St. Dev.	Minimum	Maximum
Modern Trophy Architect	5	-	-	-	-
Pre-Modern Trophy Architect	4	-	-	-	-
Floorspace (m ²)	387	8,757	10,993	181	113,666
Levels	387	8.37	4.17	4	46
Footprint (m ²)	387	1,528	1,491	66	10,806
Site area (m ²)	387	1,744	1,841	66	13,571
Floorspace/site area	387	4.829	1.933	0.348	17.296
Footprint/site area	387	0.939	0.147	0.093	1.0
Average Employment 500m	387	35,783	23,584	1,105	95,121
Built Pre-1950s	122	-	-	-	-
Built 1950s	13	-	-	-	-
Built 1960s	27	-	-	-	-
Built 1970s	25	-	-	-	-
Built 1980s	58	-	-	-	-
Built 1990s	67	-	-	-	-
Built 2000s	73	-	-	-	-
Built 2010s	2	-	-	-	-
Within Conservation Area	209	-	-	-	-
Listed	46	-	-	-	-

³ Development has a legal definition under the 1947 Act and subsequent amendments to that Act In effect it relates to any change of use of an existing plot of land or building not exempt. Very small extensions or alterations outside Conservation Areas are exempt but all office construction or change of use from, say, a shop to an office would constitute 'development' and need permission from the LPA.

Table 2a: Descriptive Statistics of Data used in Hedonic Regressions

Variable	N/Freq.	Mean	St. Dev.	Min	Max
Trophy Modern Architect	8	-	-	-	-
Pre-1956 Trophy Architect	6	-	-	-	-
Price (£m)	513	65.89	101.05	1.45	1,111.9
Floorspace (m ²)	513	9,231	11,596	181	113,666
Levels	513	8.45	4.17	4	46
Footprint (m ²)	513	1,613	1,531	66	10,806
Site area (m ²)	513	1,819	1,831	66	13,571
Price (£)/ Floorspace (m ²)	513	7,025	3,097	1,492	25,477
Price (£)/ site area (m ²)	513	34,594	20,705	1,584	141,427
Floorspace/ site area	513	4.853	1.891	0.348	17.296
Footprint/site area	513	0.938	0.147	0.093	1.0
2008 Employment 500m	513	38,134	25,044	1,508	104,476
Built Pre-1950s	162	-	-	-	-
Built 1950s	20	-	-	-	-
Built 1960s	32	-	-	-	-
Built 1970s	30	-	-	-	-
Built 1980s	80	-	-	-	-
Built 1990s	93	-	-	-	-
Built 2000s	94	-	-	-	-
Built 2010s	2	-	-	-	-
Within Conservation Area	276	-	-	-	-
Listed	63	-	-	-	-
City Core	167	-	-	-	-
City Fringe	45	-	-	-	-
Docklands	8	-	-	-	-
Mid-Town	72	-	-	-	-
North Central	14	-	-	-	-
South Central	12	-	-	-	-
Southern Fringe	17	-	-	-	-
West Central	17	-	-	-	-
West End	161	-	-	-	-

Table 2b: Distribution of sample by Quarter sold

Sold 2000 Q4	6	Sold 2005 Q1	9	Sold 2009 Q1	13
Sold 2001 Q1	6	Sold 2005 Q2	8	Sold 2009 Q2	17
Sold 2001 Q2	4	Sold 2005 Q3	14	Sold 2009 Q3	13
Sold 2001 Q3	6	Sold 2005 Q4	20	Sold 2009 Q4	14
Sold 2001 Q4	8	Sold 2006 Q1	13	Sold 2010 Q1	12
Sold 2002 Q1	5	Sold 2006 Q2	20	Sold 2010 Q2	21
Sold 2002 Q2	8	Sold 2006 Q3	19	Sold 2010 Q3	19
Sold 2002 Q3	5	Sold 2006 Q4	20	Sold 2010 Q4	19
Sold 2002 Q4	4	Sold 2007 Q1	15	Sold 2011 Q1	13
Sold 2003 Q1	5	Sold 2007 Q2	27	Sold 2011 Q2	10
Sold 2003 Q2	9	Sold 2007 Q3	19		
Sold 2003 Q3	5	Sold 2007 Q4	15		
Sold 2003 Q4	11	Sold 2008 Q1	10		
Sold 2004 Q1	13	Sold 2008 Q2	12		
Sold 2004 Q2	11	Sold 2008 Q3	7		
Sold 2004 Q3	11	Sold 2008 Q4	5		
Sold 2004 Q4	12				

Sample of buildings and sales

Data on office building characteristics and sale prices were obtained from Estates Gazette (EG) and Real Capital Analytics (RCA). Combined, the EG and RCA data sum to 2,932 unique sales in central and outer London between 1998 and 2011. This dataset however had to be cleaned and supplemented with additional information about individual buildings. Many offices turned out to be small parts of buildings, above

shops, for example. We restricted the sample to buildings which were purpose-built office buildings (occasionally with minor other uses – caretakers' flats, shops or restaurants – within them). We also discarded all buildings – only a handful – not in Inner London [for a definition of Inner London see Dericks, 2012]. The location of buildings in the sample is shown in Figure 1. The resulting final number of distinct buildings was 387 which, with 126 which were sold more than once, gave a total of 513 sales.

Trophy Architects

Architectural excellence is necessarily a subjective judgment but peer recognition seems the most objective measure available. We have taken the awards from the Royal Institute of British Architects (RIBA), the American Institute of Architects (AIA), and the Pritzker Prize as the most prestigious and obvious recognition of architectural merit within the architectural community: winners of awards from these bodies have been deemed 'Trophy architects'. Buildings built by architects who had already won one of these awards, therefore, are defined here as designed by trophy architects. Given the exclusivity of these awards the number of potential candidates and buildings is limited. We are able to include only ten such trophy architect buildings⁴. Four of these are located outside of a Conservation Area and so had potential flexibility with respect to their height via the process of development control and appeal. Of the ten buildings designed by trophy architects, four were built before 1956 (between 1888 and 1925) and so in an era when fire regulations absolutely restricted their height. These pre-1956 buildings are referred to as Pre-Modern trophy architect buildings in contrast to the Modern trophy architect buildings.

Spatial units

Data has been assembled from various sources and for different spatial units. These include

Administrative Regions: London boroughs, responsible, for example, for the implementation of planning policy. The sample of 387 buildings falls in all ten boroughs in inner London - the City of London, the City of Westminster, Tower Hamlets (containing the Docklands), Southwark, Lambeth, Kensington and Chelsea, Hammersmith and Fulham, Islington, Hackney, and Camden. Although the sample of 387 buildings used in this study is spread across all 10 boroughs, 86% of the 387 are located in just four, the City of Westminster, Camden, Islington, and the City of London.

Postcode sectors: these, much smaller than Boroughs, were used to construct the employment density variable explained below. In Greater London 546 had a sampled property in, or within, 2km of its boundary. A map of these 576 postcode sectors and the location of the sampled buildings is shown in Figure 1.

GIS Data

Digital Ordnance Survey data was used to locate all stations, parks, public gardens and water ways or bodies of water. It was also used to calculate the area of the site on which each building was located.

Planning data

Important to the work was information on the operation of the planning system and on the historic conservation designations discussed above. Data on Conservation Areas was acquired from the London Mayor's Office with maps produced by Landmark Information Group. Data on the 'Listed' status of buildings comes from English Heritage. Of the 387 buildings in the sample 209, or 54% are located within a Conservation Area, and 46, or 12%, are Listed.

⁴ The architects on this list and for whose buildings we were able to collect complete information are Cesar Pelli, Norman Foster, Terry Farrell, Aston Webb, Edward Lutyens, and Joseph Emberton. The tallest building in Europe, the 'Shard' designed by triple Gold Medal-winning architect Renzo Piano is not part of the sample.

As Table 3 below shows, a large percentage of the total land area in the four boroughs where the great majority of our sampled buildings was located are covered by Conservation Areas.

Figure 1: The 546 postcode sectors and 387 office locations

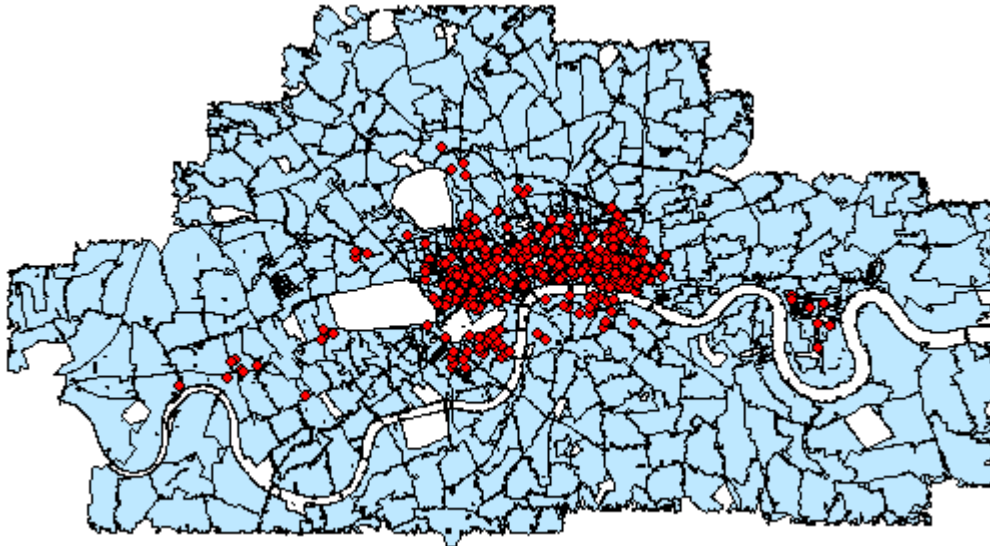


Table 3: Conservation Areas in central London boroughs

	Number of areas	Percent of total area covered	First introduced
City of Westminster	55	75%	1967
Camden	39	50%	1968
Islington	40	50%	1968
City of London	26	33%	1971

The variable *conservation density 300m* was approximated by randomly adding one point for each 10m² of Conservation Area within each Conservation Area's perimeter, with a minimum distance between points of 1m, and then calculating the number of points which fell into a 300m radius of each building. The variable *listed building density 300m* was calculated by spatially matching the point map of Listed buildings from English Heritage with the Ordnance Survey containing a map of each building's site (or p/lot). Then a point was randomly placed within each Listed building's site for every 10m² of its total area, with a minimum inter-point distance of 1m. The number of such points which fell within 300m of each office building in the sample was then summed to create the variable.

For the analyses of the effects of Conservation Area status on building size, buildings are only identified as located in a Conservation Area if built after the Conservation Area was designated. For the price models buildings were only defined as in a Conservation Area if the building was located within a Conservation Area at the time of sale. The most notable tall buildings in the sample which were built before a Conservation Area was defined which included them but became located in a Conservation Area designated subsequently were 103 New Oxford Street (33 Floors) and 1 Angel Court (19 Floors).

Parks and Gardens

A digital map of London's parks and gardens was acquired from English Heritage. The variable *Parks and gardens density* was calculated by placing a random point within the perimeter of each park or garden for

each 10m^2 , with a minimum distance between points of 1m. Then the total number of points within a 300m radius of each office property was counted.

Planning Permission Refusal Rate

London Boroughs, the LPA, have varying degrees of regulatory restrictiveness. We use data on office planning refusal rates from 1990 to 2008 for all ten Boroughs covering the 387 properties in the sample obtained from the estimates generated by Hilber and Vermeulen (2012). As has been discussed widely in the literature (Cheshire and Sheppard, 1989, Hilber and Vermeulen, 2012, or Cheshire *et al*, 2012) planning permission refusal rates are potentially endogenous. Since planning applications cost considerable resources would-be developers will likely adjust their applications depending on the restrictiveness of the LPA in question. Two London LPAs have exceptional planning regimes (the City of London and the Docklands - in the Borough of Tower Hamlets - but for most of its effective development covered by a special purpose planning authority the London Docklands Corporation) so measured 'planning restrictiveness' may imply something rather different to elsewhere. Both the issue of endogeneity and this caveat must be borne in mind. Because of the special planning regimes in the City of London and the Docklands specific dummies are included in some models for these LPAs.

Employment Density

The most detailed statistics on the location of employment in London are those for postcode sectors from the NOMIS Annual Business Inquiry (ABI) Employee Analysis. This data begin in 2000 and the most recent available for this analysis are for 2008. Furthermore, only employees from industries with a 2003 SIC section code of J or K, corresponding to banking, finance, business services and insurance were included in this count. There is a structural break in the data between 2005 and 2006. We therefore re-scaled our 2006-08 values *pro rata* using the scaling factor provided by the ONS for London SIC codes J and K.

Using the resulting data a map of employment density was constructed from all the postcode sectors in Greater London by including all postcode sectors that have any part of their boundary within 2km of any office property in the sample. This left the 546 postcode sectors mapped in Figure 1. All water features, Parks and Gardens were then removed to eliminate areas where employees could not be located. Then a number of points corresponding to the employment counts within the remaining boundaries of each of the 546 postcode sectors for each year between 2000 and 2008 were randomly placed within each boundary and then the number of employees within a radial buffer of 500m from each property at the year of sale was calculated. 500m was chosen as this has been empirically observed in studies of other cities to correspond approximately to the range of employment on value (see. For example, Arzaghi and Henderson, 2008; or and Jennen and Brounen, 2009).

We note that employment density as measured is automatically somewhat endogenous with respect to building size since employment in the building in question is included in the postcode sector's employment count. So in effect, every building adds to its own density, and therefore big (occupied) buildings help cause higher density. In practice this effect is likely to be small, however, since the average employment count per 500m radial distance from each property between 2000-08 is 35,000 and a reasonable estimate of the average number of workers in a fully occupied building is 550^5 - or 1.6% of the employees in the average postcode sector in our sample. There could also be an issue of endogeneity as a result of unobserved physical and environmental characteristics affecting the location of both employment and larger office buildings. We therefore try instrumenting for employment density at the time of sale with various employment density measures derived from the 1981 census at the local authority level.

⁵ The average building size in the sample is $9,400\text{m}^2$. If we take an average of 185 sq ft (17.1m^2) per worker, that leaves us with an average of 550 workers per building

A further problem with our employment density measure is that the data are only available from 2000, while many of the buildings were built as far back as the 19th century. As accurate data on local employment densities in London for this period could not be obtained, the average employment density between 2000-08 is used in models which estimate building size, and instruments are used to predict this variable in the IV2SLS specifications.

Access to Labour Force

Access to the labour force is estimated by taking the distance in metres to the nearest underground or other rail station. Although simple, this statistically outperforms more apparently more sophisticated measures of accessibility to the labour force (see Dericks, 2012).

Submarket Area

Submarkets were defined according to Estates Gazette's market definition shown below.

South Central: Remainder of SE1 and all of SE11

North Central: Remainder of NW1 and N1 and all of E8

West Central: Remainder of W2 and all of W6, W8, W14, SW3, SW5, SW6, SW7 & SW10

Building Characteristics

Data on building characteristics such as its age, the number of floors⁶, the number of basements, number of parking spaces, single or multi-tenant, and air conditioning (A/C) was gathered from Estates Gazette, RCAanalytics, internet research, and site visits to each building. The quality measure comes from Estates Gazette, which grades each floor of a building either A or B. Buildings with only grade A space are graded as an A, with A and B graded A/B, and only B space is the omitted dummy variable. Data on the size of building footprints and sites comes from Ordnance Survey MasterMap.

Whereas most hedonic studies include a building's age and possibly a dummy variable indicating whether the building has ever been refurbished, we try here to use a more accurate measure for obsolescence by calculating the number of years at the time of sale since the building had been built or last refurbished. This is called *Depreciation Age*.

4. Analysis

Can trophy architects build bigger?

The first question we are going to examine is whether trophy architects have been able to build more office space on a given plot of land since 1956, when binding height restrictions were lifted. Before 1956 the height of a building - no matter who designed it - was fixed by fire regulations so we do not expect to find any trophy architect effect for buildings built before then. We also do not expect to find even the most famous architect would have been able to flex the regulations governing the height and appearance of buildings built in a designated Conservation Area. To test this hypothesis, we employ our data set of 387 buildings which include 10 designed by trophy architects. Of these, four are post-1956 and outside a Conservation Area, two other post-1956 buildings were inside an already designated Conservation Area, and four predate 1956. We test this for both height alone and for total floorspace relative to site size. The results are reported in Tables 4a and b and 5. As will be obvious we are attempting to identify a trophy architect effect off a very small sample. This point is addressed below and in Tables A1, A2 and A4.

⁶ Like employment density the number of floors may also be endogenous with respect to prices (see Koster et al, 2011). Although suitable instruments for the number of floors were not found, this should not be problematic as the focus of this study is not the estimation of the causal relation between floor height and sale price.

Tables 4a and 4b report the results where total floorspace relative to site area is the dependent variable. Model 1 of Table 4a, simply lumps all trophy architect buildings together. We see that they are indeed significantly bigger. Since we only expect trophy architects to be able to build bigger outside a Conservation Area and after 1956, Model 2 interacts a trophy architect dummy for the building with built outside a Conservation Area⁷. The results are stronger and the trophy architect effect is significant at the 1 percent level but confirms that the ability of a trophy architect to get more space on a site is confined to sites outside Conservation Areas. We also see that buildings tend to be smaller relative to the size of the site the more restrictive is the local planning system. Subsequent models add decade in which the building was constructed and dummies for the City of London and Docklands. The basic results are confirmed – indeed becomes more significant.

Table 4a: Can Trophy Architects Build Bigger? Dependent variable total floorspace/ site area

	(1) OLS	(2) OLS	(3) OLS	(4) OLS
VARIABLES				
Trophy Architect outside Conservation Area		4.888***	3.874***	3.346***
		(0.876)	(0.849)	(0.567)
Trophy Architect	1.822**	-0.135	0.117	0.208
	(0.865)	(0.356)	(0.365)	(0.386)
Built in Conservation Area	-0.112	-0.0833	-0.510**	-0.457**
	(0.199)	(0.195)	(0.222)	(0.229)
Mean Office Permission Refusal Rate	-11.16***	-11.30***	-10.27***	-15.50***
	(1.549)	(1.518)	(1.573)	(3.682)
Built 1950s			0.120	0.156
			(0.387)	(0.394)
Built 1960s			0.888	0.924
			(0.583)	(0.586)
Built 1970s			0.590*	0.646*
			(0.333)	(0.337)
Built 1980s			0.380	0.334
			(0.291)	(0.305)
Built 1990s			0.764***	0.743***
			(0.256)	(0.253)
Built 2000s			1.432***	1.378***
			(0.265)	(0.271)
Built 2010s			0.424	0.354
			(0.810)	(0.878)
City of London				-0.668
				(0.495)
Docklands				1.757***
				(0.672)
Constant	5.737***	5.742***	5.189***	5.820***
	(0.173)	(0.172)	(0.205)	(0.478)
Observations	387	387	387	387
R-squared	0.146	0.186	0.247	0.267
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				

⁷ Namely: (Building designed by trophy architect) x (Outside Conservation Area).

Table 4b reports two more models still with total floorspace relative to site size as the dependent variable. Model 1 adds the employment density in the area surrounding the building to a range of 500 metres. Although in practice likely to be very slight (for reason discussed above in Section 3) there could be an issue of endogeneity – since our measure of employment density at a given location includes employment in the building itself. In Model 2, therefore, we try to instrument it with a rather cruder measure of employment density in the area in 1981. This does not perform well, however, although other parameter estimates are not greatly affected⁸. In what we might think of as our preferred model in Table 4b, Model 1, all previous results remain: indeed remain more significantly. Moreover we find evidence that local employment density is also related to more floorspace relative to the size of the site. White tests reject the null hypothesis of homoskedasticity, and so robust standard errors are reported.

Table 4b: Can Trophy Architects Build Bigger? Dependent variable total floorspace/ site area

VARIABLES	(1) OLS	(2) IV2SLS
Trophy Architect outside Conservation Area	3.267*** (0.525)	2.959*** (0.723)
Trophy Architect	0.131 (0.320)	-0.172 (0.389)
Built in Conservation Area	-0.482** (0.226)	-0.581** (0.260)
Average Office Permission Refusal Rate	-14.62*** (3.625)	-11.21** (4.862)
Built 1950s	0.177 (0.388)	0.259 (0.407)
Built 1960s	1.003* (0.594)	1.312* (0.685)
Built 1970s	0.691** (0.331)	0.865** (0.395)
Built 1980s	0.343 (0.303)	0.378 (0.323)
Built 1990s	0.716*** (0.253)	0.611** (0.302)
Built 2000s	1.392*** (0.267)	1.445*** (0.285)
Built 2010s	0.179 (1.067)	-0.503 (1.851)
City of London	-1.151** (0.511)	-3.043* (1.644)
Docklands	1.870*** (0.642)	2.313*** (0.670)
Average Employment 500m	1.45e-05** (6.43e-06)	7.14e-05 (4.83e-05)
Constant	5.388*** (0.521)	3.697** (1.549)
Observations	387	387
R-squared	0.277	0.124

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Wald chi2(14) = 218.73

⁸ The 2SLS instrument has an acceptable Wald statistic of 218.73 confirming its relevance, and the first stage regression has an R-squared of .1240. Durbin-Wu-Hausman test of exogeneity of the dependent variable is not rejected (p=.2092), and Sargan-Hansen tests do not reject the exogeneity of the instruments. Unfortunately however the instrumented employment density is not a significant predictor of floorspace/site m² (t-stat=1.48)

Table A1 is a form of robustness check for sample size. Given the very small number of trophy architect buildings outside a Conservation Area there has to be concern as to the robustness of these results. We put them to a quite stringent test by successively dropping the tallest trophy architect building outside a Conservation Area, then additionally dropping the second tallest and then the three tallest. Very reassuringly almost nothing changes – even parameter estimates - except obviously the estimated extent of the additional floorspace (we are dropping the biggest, additionally the second biggest etc after all) a trophy architect brings you on a given site outside a Conservation Area.

Table 5: Can Trophy Architects Build Taller? Dependent variable No of floors above ground level/site area

VARIABLES	(2) OLS	(3) OLS	(4) OLS	(5) IV2SLS
Trophy Architect outside Conservation Area	20.65*** (6.513)	20.20*** (5.996)	20.02*** (5.875)	20.21*** (5.891)
Trophy Architect	-0.346 (0.589)	-0.540 (0.602)	-0.711 (0.575)	-0.525 (0.653)
Built in Conservation Area	-1.296*** (0.248)	-1.048*** (0.274)	-1.104*** (0.270)	-1.044*** (0.291)
Average Office Permission Refusal Rate	-5.773* (3.121)	2.876 (10.39)	4.806 (10.35)	2.711 (9.884)
Built 1950s	1.386*** (0.389)	1.298*** (0.379)	1.344*** (0.362)	1.294*** (0.384)
Built 1960s	5.217*** (1.519)	5.150*** (1.476)	5.324*** (1.473)	5.135*** (1.499)
Built 1970s	2.495*** (0.656)	2.295*** (0.660)	2.394*** (0.672)	2.287*** (0.668)
Built 1980s	0.533** (0.262)	0.237 (0.304)	0.257 (0.309)	0.235 (0.303)
Built 1990s	1.546*** (0.325)	1.220*** (0.356)	1.160*** (0.351)	1.225*** (0.358)
Built 2000s	2.283*** (0.342)	1.984*** (0.361)	2.014*** (0.357)	1.982*** (0.363)
Built 2010s	1.802 (1.399)	1.718 (1.136)	1.332 (1.552)	1.751 (1.270)
City of London		1.214 (1.196)	0.143 (1.280)	1.305 (2.352)
Docklands		3.966** (2.010)	4.217** (1.959)	3.945** (1.975)
Average Employment 500m			3.22e-05*** (1.21e-05)	-2.75e-06 (5.33e-05)
Constant	6.625*** (0.339)	5.560*** (1.226)	4.603*** (1.250)	5.642*** (1.733)
Observations	387	387	387	387
R-squared	0.441	0.457	0.468	0.454

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

In principle trophy architects might build bigger by either building taller or squeezing a bigger building footprint onto a site of a given size. We only report the analysis of the variation in the size of the building's footprint with respect to site size in Table A3. The results are wholly insignificant - there is no evidence that trophy architects inside or outside a Conservation Area are able to influence this variable. Once we have controlled for the same variables used in Table 4b Model 1, we do observe a significant tendency for office buildings built in Conservation Areas to have larger footprints relative to site size (they are, as Table 5 reveals, lower) than those built elsewhere and for more restrictive local planning regimes to be associated with smaller footprints. There is, of course, what might be thought of as a natural limit to the footprint/site m^2 : it cannot exceed a value of 1. But even here ingenuity by design could triumph. There is an interesting exception to this rule currently under construction in the City – the 36-floor 'Walkie-talkie' building designed by aspirant trophy architect Rafael Viñoly. This has a tapered base and bulges towards its roof so may overcome the limit on mean building footprint one might assume would be imposed by site size

How trophy architects succeed in getting more office space on a given site is revealed in Table 5. They are extremely successful at building taller. They can add 20 extra floors for the characteristics of a given site outside a Conservation Area. If we assume 3m per floor, that would mean that office building built by a trophy architect outside a Conservation Area are on average 60m taller than buildings designed by 'normal' architects. Recall that 24m was the maximum allowable total height of all buildings to the roof cornice built between 1894 and 1956. Indeed this extra height trophy architects gain may be a reason why their buildings do not have bigger footprints. With a taller building it may be important to allow more space around the building to maintain light and also reduce the funnelling effect of winds. Again White tests reject homoskedasticity in all cases so we report robust standard errors.

Reflecting results from previous models the un-interacted trophy architect dummy has no effect on building height. It is only outside Conservation Areas that trophy architects can successfully exert their influence on the planning system. Indeed within Conservation Areas all office buildings tend to be lower and the effect of a more restrictive local planning regime disappears. Local employment density is significantly and positively related to building height although the instrumented employment density is again not a significant predictor with very similar results to those summarised in footnote 7.

What is the value associated with a trophy architect?

Having established that where there is any flexibility in London's land use planning system, trophy architects are able to get more space on a given site by building taller than regular architects are able to do, the issue is what value does this provide? More rentable space will add to the price of a building, other things equal, but other factors associated with trophy architect design might reduce the rent per m^2 or increase maintenance costs. A less conventional layout might reduce the rent per m^2 or reduce the proportion of space that was lettable; unconventional building materials or design might impose additional maintenance costs (for example, the costs of cleaning the windows in Norman Foster's 41-floor Gherkin building). There might also be a greater chance of the building becoming 'Listed' and therefore impossible to either adapt or redevelop – effectively freezing the use of the site in perpetuity and eliminating any option value on the site.

We address this issue by means of a 'classic' hedonic model. We fully recognise the potential problems of omitted variables but our focus of interest is on several characteristics of buildings and their settings at the same time and also on specific price estimates. These allow us in the next section to compare the gross value of the 'rents' associated with employing a trophy architect in a highly regulated environment with the costs of the trophy architect – the rents that accrue to the instrument of rent acquisition as opposed to the

owners of the assets. We have, however, made great efforts to seek out as wide a range of relevant control variables as possible to minimise any problem associated with omitted variables.

Table 6: What do Trophy architects yield in price per m² of building? Dependent variable ln price per m²

VARIABLES	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS
Trophy Architect	-0.369*** (0.102)	-0.394*** (0.0985)	-0.232** (0.0917)	-0.223** (0.0865)	
Modern Trophy Architect					0.00891 (0.111)
Pre-Modern Trophy Architect					-0.561*** (0.133)
Within Conservation Area	0.0866** (0.0398)	0.0771** (0.0392)	0.0269 (0.0365)	0.0313 (0.0359)	0.0356 (0.0355)
Listed Bldg	0.00371 (0.0532)	-0.0236 (0.0571)	-0.0214 (0.0474)	-0.0385 (0.0506)	-0.0134 (0.0506)
Ln(Office Permission Refusal Rate 9yr Moving Average)	0.0392*** (0.0140)	0.0414*** (0.0135)	0.0271* (0.0156)	0.0300** (0.0150)	0.0305** (0.0149)
Ln(Employment Density 500m)	0.104*** (0.0279)	0.0840*** (0.0272)	0.175*** (0.0342)	0.157*** (0.0330)	0.157*** (0.0327)
Ln(Cons. Area Dens 300m)	0.0195** (0.00810)	0.0231*** (0.00784)	0.00556 (0.00898)	0.00765 (0.00869)	0.00656 (0.00860)
Ln(Listed Bldg Density 300m)	0.0261** (0.0125)	0.0310** (0.0121)	0.0252* (0.0150)	0.0233 (0.0147)	0.0278* (0.0146)
Ln(Park & Garden Dens. 300m)	0.00886*** (0.00288)	0.00833*** (0.00280)	0.00945*** (0.00269)	0.00935*** (0.00261)	0.00950*** (0.00258)
Adjacent to Park or Garden	0.261*** (0.0521)	0.204*** (0.0514)	0.182*** (0.0465)	0.147*** (0.0458)	0.148*** (0.0453)
Ln(Nearest Rail Station Distance)	0.0320 (0.0304)	0.0102 (0.0296)	0.0151 (0.0277)	-0.00518 (0.0269)	-0.0110 (0.0267)
Ln(No of Above-Ground Floors)	0.274*** (0.0569)	0.336*** (0.0579)	0.154*** (0.0518)	0.207*** (0.0539)	0.169*** (0.0545)
Ln(Depreciation Age)	-0.0132* (0.00742)	-0.00796 (0.00759)	-0.0159** (0.00659)	-0.00756 (0.00672)	-0.00881 (0.00666)
Ln(Basements/Total Floors)	-0.00964 (0.00941)	-0.0209** (0.00929)	-0.00909 (0.00837)	-0.0205** (0.00829)	-0.0207** (0.00820)
A/C	0.340*** (0.0891)	0.244*** (0.0878)	0.264*** (0.0801)	0.202** (0.0787)	0.224*** (0.0781)
EG Office Grade A/B	0.0688 (0.0490)	0.0433 (0.0490)	0.0614 (0.0437)	0.0348 (0.0434)	0.0314 (0.0429)
EG Office Grade A	0.158*** (0.0433)	0.0831* (0.0443)	0.161*** (0.0386)	0.0832** (0.0395)	0.0886** (0.0391)
Ln(Percent Occupied)	0.0359*** (0.00927)	0.0292*** (0.00904)	0.0360*** (0.00819)	0.0300*** (0.00796)	0.0268*** (0.00793)
Multiple Tenant Bldg	-0.0502 (0.0387)	-0.0855** (0.0382)	-0.0629* (0.0343)	-0.106*** (0.0337)	-0.0999*** (0.0334)
Ln(Parking Spaces)	-0.000768 (0.00404)	0.00171 (0.00398)	0.00257 (0.00358)	0.00413 (0.00351)	0.00435 (0.00348)
Decade Built	NO	YES	NO	YES	YES
Submarket Dummies	NO	NO	YES	YES	YES
Quarter Sold	YES	YES	YES	YES	YES
Constant	5.901*** (0.350)	6.233*** (0.342)	5.554*** (0.408)	5.862*** (0.396)	5.891*** (0.391)
Observations	513	513	513	513	513
R-squared	0.447	0.499	0.580	0.621	0.630

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Results are reported in Tables 6 and 7. Note that whereas previously we have been analysing the physical characteristics of 387 buildings, the sample size now consists of the 529 sales of these buildings completed between 2000-2011. Moreover we are measuring 'price' in terms of the capital value of transacted buildings. White tests do not reject homoscedasticity, and so normal standard errors are reported.

The dependent variable in the models reported in Table 6 is the price per m² of the building – so we are abstracting from the size effect that trophy architects can achieve. Models 1 to 4(in cols 2 to 5) of Table 6 are identical save that they variously include Decade built, and submarket dummies. In model 1 we observe parameter estimates which in almost all cases conform to priors and are significant. The exceptions are that there appears to be no discount for Listed buildings and parking spaces do not command a premium. The latter finding is perhaps less surprising in London given the reliance on public mass transit for commuting to work and the congestion charge on cars using the central zone where almost all the buildings are located. Otherwise the price per square metre rises significantly as the restrictiveness of the local planning regime becomes tighter, the higher is local employment density, the more the building is surrounded with Conservation Area (whether it is in a Conservation Area is controlled separately and is only mildly significant, if positive) and the more Listed buildings there are in the local area. Parks and gardens both around the building and immediately adjoining it add to its value as does its height (there is in London a documented rental premium for higher floors briefly discussed in Cheshire and Hilber 2008), the better the state of the building and its reported quality. Not surprisingly price paid per m² also rises with the proportion of the structure occupied by tenants: there is some indication that multiple tenants reduce value.

The point of interest here, however, is the impact on price per square metre of being designed by a trophy architect. Looking at the first four models this appears to be negative and significant. However in Model 5, reported in column 6, trophy architect buildings are divided into those designed in the modern era, post 1956, and designed by what we call pre-modern trophy architects – those designing buildings constructed essentially before WWII and, so far as our sample is concerned, between 1888 and 1925. This shows that the real impact on price per square meter is for the pre-modern trophy architect buildings. Here there is a substantial and negative effect on price. Although the sign associated with a modern trophy architect building is negative, it is not significant. The big discount per square metre for these old buildings is probably because they are obsolete in design but cannot be changed because they are Listed. We also checked for possible interaction between the trophy architect variables and the proportion of the building occupied on the grounds that trophy architect design might impact on occupancy rates. There turned out to be no such affect so this source of possible bias is not relevant.

There may be concerns with respect to the endogeneity of the local employment density but as before instrumenting this with rather cruder values calculated for 1981 do not perform well although co-efficient estimates and significant levels for other variables hardly change from those reported for Model 5.

Thus trophy architects – at least those building in the modern era – do not appear to have any significant impact on the unit price of space in the buildings they design. But we have already seen that they achieve larger – notably taller – buildings on a given site if that site is outside a Conservation Area. So now let us turn to the impact that trophy architects have on the total value of a building on a given site. The results of this analysis are reported in Table 7 where the dependent variable is the price paid for the building per unit area of the building's site. The models follow closely those reported in Table 6 but include separately whether the building was inside a Conservation Area when constructed and also interacts this with whether designed by a trophy architect. In addition, in Model 5 reported in the last column of Table 7, Modern and Pre-modern trophy architects are distinguished following the finding reported in Table 6, Model 5. In effect we are analysing here what the net effect of more (but perhaps cheaper) space has on the total price paid for an office on a given site.

Table 7: What Value does a Trophy Architect add to a site? Dependent variable building price per m² of site

VARIABLES	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS
Trophy Architect outside Conservation Area	0.945*** (0.240)	0.873*** (0.228)	1.067*** (0.185)	1.013*** (0.168)	1.058*** (0.312)
Trophy Architect	-0.495*** (0.128)	-0.494*** (0.108)	-0.396*** (0.138)	-0.402*** (0.128)	
Modern Trophy Architect					-0.447 (0.290)
Pre-Modern Trophy Architect					-0.386*** (0.141)
Within Conservation Area	0.0374 (0.0676)	0.0600 (0.0853)	-0.0674 (0.0631)	-0.0524 (0.0817)	-0.0527 (0.0819)
Built in Conservation Area	-0.0956 (0.0725)	-0.158 (0.103)	-0.00257 (0.0629)	-0.0415 (0.0950)	-0.0403 (0.0955)
Listed Bldg	-0.0923 (0.0724)	-0.121 (0.0771)	-0.0965 (0.0705)	-0.142* (0.0778)	-0.143* (0.0782)
Ln(Office Permission Refusal Rate 9yr Moving Av.)	0.0210 (0.0211)	0.0205 (0.0207)	0.0113 (0.0212)	0.0129 (0.0202)	0.0129 (0.0202)
Ln(Employment Density 500m)	0.296*** (0.0452)	0.284*** (0.0434)	0.239*** (0.0538)	0.223*** (0.0511)	0.223*** (0.0514)
Ln(Conservation Area Density 300m)	-0.00416 (0.0118)	-0.00308 (0.0126)	-0.0157 (0.0142)	-0.0160 (0.0145)	-0.0160 (0.0145)
Ln(Listed Bldg Density 300m)	0.00185 (0.0252)	0.00864 (0.0234)	0.00586 (0.0249)	0.0116 (0.0237)	0.0116 (0.0238)
Ln(Park and Garden Density 300m)	0.0204*** (0.00405)	0.0198*** (0.00411)	0.0170*** (0.00385)	0.0173*** (0.00384)	0.0173*** (0.00384)
Adjacent to Park or Garden	0.321*** (0.0775)	0.259*** (0.0782)	0.211*** (0.0698)	0.175** (0.0700)	0.175** (0.0703)
Ln(Nearest Rail Station Distance)	-0.0106 (0.0522)	-0.0329 (0.0555)	-0.00625 (0.0482)	-0.0189 (0.0507)	-0.0185 (0.0508)
Ln(Depreciation Age)	-0.0193* (0.0103)	-0.0127 (0.0101)	-0.0223** (0.00889)	-0.0127 (0.00931)	-0.0126 (0.00935)
Ln(Basements/Total Floors)	-0.00635 (0.0148)	-0.0181 (0.0142)	-0.00475 (0.0143)	-0.0178 (0.0134)	-0.0179 (0.0134)
A/C	0.610*** (0.119)	0.552*** (0.126)	0.482*** (0.130)	0.456*** (0.131)	0.455*** (0.132)
EG Office Grade A/B	0.326*** (0.0710)	0.321*** (0.0709)	0.279*** (0.0658)	0.268*** (0.0657)	0.269*** (0.0660)
EG Office Grade A	0.459*** (0.0655)	0.402*** (0.0662)	0.411*** (0.0586)	0.357*** (0.0593)	0.357*** (0.0594)
Ln(Percent Occupied)	0.0311** (0.0157)	0.0249 (0.0153)	0.0323** (0.0141)	0.0257* (0.0139)	0.0259* (0.0140)
Multiple Tenant Bldg	0.0553 (0.0557)	0.00878 (0.0554)	0.0331 (0.0506)	-0.0129 (0.0509)	-0.0131 (0.0510)
Ln(Parking Spaces)	0.00585 (0.00549)	0.00783 (0.00575)	0.00579 (0.00489)	0.00795 (0.00514)	0.00796 (0.00514)
Decade Built	NO	YES	NO	YES	YES
Submarket Dummies	NO	NO	YES	YES	YES
Quarter Sold	YES	YES	YES	YES	YES
Constant	6.064*** (0.501)	6.389*** (0.516)	6.692*** (0.552)	7.013*** (0.557)	7.018*** (0.558)
Observations	513	513	513	513	513
R-squared	0.473	0.500	0.583	0.605	0.605

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

We observe that trophy architect buildings outside a Conservation Area are worth significantly more for a given site area: they are taller and there is more lettable space in them. However we also notice that being designed by a trophy architect, on average reduces, the value of a building per unit area of its site although this effect is only significant for Pre-Modern trophy architects (and buildings)⁹.

Other variables tend to be less significant than those for the unit price of space within buildings (Table 6). The effect of local employment density and concentration of, and access to, parks and gardens remains as does the impact of the rated quality of space and the proportion occupied. However the 'depreciation age' is rather less significant and the impact of surrounding Listed buildings and Conservation Areas disappears. That a building is Listed, however, now appears to have a negative impact on the price of a building for the size of its site although this is only on the margins of significance. Also the restrictiveness of the local planning regime ceases to be significant. This can perhaps be explained by the realisation that there could be two effects of restrictiveness working against each other. The first, and apparently more powerful, is that the supply of office space in more restrictive planning authorities is relatively even more restricted and so more valuable (reflected in Table 6). On the other hand in more restrictive planning authorities' jurisdictions it may be even more difficult to flex the system to get taller buildings so while a square metre of space is more valuable, even a trophy architect may have difficulty getting as much additional space on a given site and this dual impact is reflected in the estimates reported in Table 7.

The total effect on a building's price relative to the size of its site if it is designed by a trophy architect outside a Conservation Area is the value of the 'trophy architect' and 'trophy architect outside Conservation Area' coefficients summed. We see that in all specifications the interactive benefit of a trophy architect building built outside a Conservation Area (and so getting those extra floors on a given site associated with such buildings) outweighs the negative costs associated with its design. In the most preferred specification - reported as Model 4 - the net effect of these two factors is approximately 0.6, or roughly an 80% increase in building price for a given site size given the semi-log specification¹⁰. Buildings inside a Conservation Area, however, do not get the extra floors associated with trophy architects building outside a Conservation Area and so there would be a net cost associated with employing such an architect to design a building on a site within a Conservation Area.

We also experimented using the instrument for local employment density and controlling for the number of floors. The former performed no better than in previous models but did not change estimated co-efficient values of other variables in any significant way. We included the number of above ground floors to see if this would, so to speak, steal the 'trophy architect outside a Conservation Area' effect. It did - consistent with the previous interpretation of results reported in Table 7: that the extra value trophy architects achieve designing a building located outside a Conservation Area stems from their ability to flex the planning system and build taller.

Finally (see Table A4) we tested the robustness of the results to successively dropping the tallest trophy architect buildings from the sample. Table A4 Model 1 – in the second column – repeats the estimate of Table 7 Model 5. The estimated co-efficients are just slightly different because of some data cleaning between the two sets of estimates. We can see that as the tallest, then two and three tallest buildings, are dropped the estimates remain reassuringly unchanged and still significant. In effect the results are not sensitive to eliminating observations despite the small number of trophy architect buildings and despite dropping the tallest buildings selectively.

⁹ The co-efficient estimates for the impact of Modern and Pre-Modern trophy architects are not significantly different however: we cannot reject the null hypothesis that they are in fact equal ($p=0.8508$).

¹⁰ See Kennedy (1981) for the exact calculation.

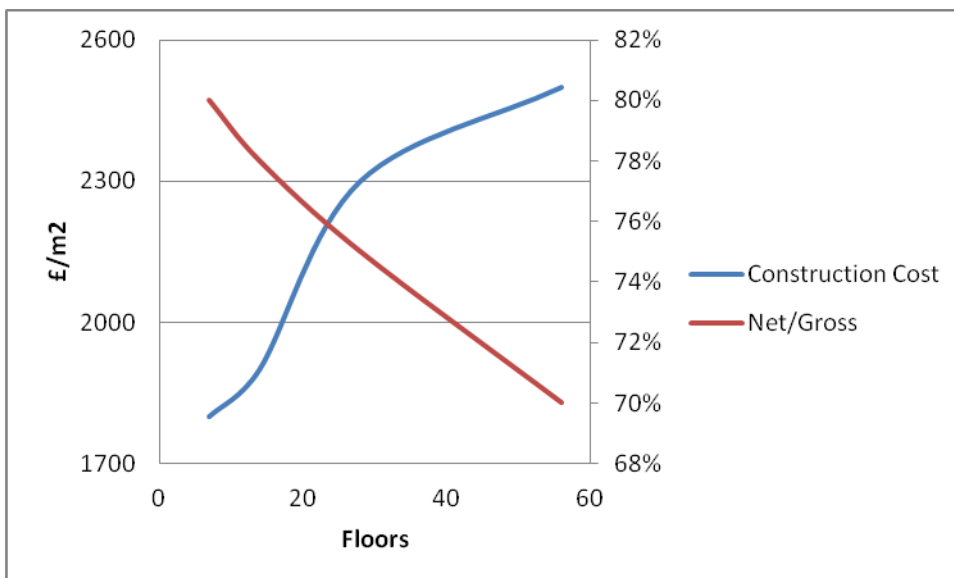
Taken together, although it appears that trophy architects negatively influence or have no influence on the price per unit of floorspace, because of the fact that they can stack more units of floorspace up on a given amount of land, they are net, able to increase the price of a building built on that land, so long the site is outside a Conservation Area so building height becomes in some sense, negotiable.

5. What is the net value of rents obtainable by design?

This, however, is only part of the story. Trophy architects may be able to generate more value but they also cost more. From Table 5 we know that trophy architects outside a Conservation Area can increase the number of floors in their buildings by approximately 20, with a standard deviation of about 6. This would mean that employing a trophy architect would allow a developer to go from an original allowable building height of 8 floors (our sample mean) to 28 floors. Just how valuable is this increase in floorspace to a developer once any extra costs have been paid? In order to address this question we use; (i) permissible development area land cost, (ii) gross internal area construction costs for standard and trophy architect designed office buildings by height, (iii) design costs for standard and trophy architects, and (iv) net-to-gross floorplate ratios by building height – that is the ratio of lettable space to gross internal area ¹¹. The hypothetical building in question is supposed to have a 1,600m² footprint (i.e. 40m a side squared, our sample mean) and to be located in the City of London. All office construction cost data were provided by the construction consultants Gardiner & Theobald.

The data from Gardiner & Theobald show that construction cost per m² rise fastest going from 20 to 30 floors, but is comparatively flat for buildings both below and above this height. This relationship is graphed in Figure 2 below with the net lettable-to-gross floorspace ratio also shown as a function of the number of floors.

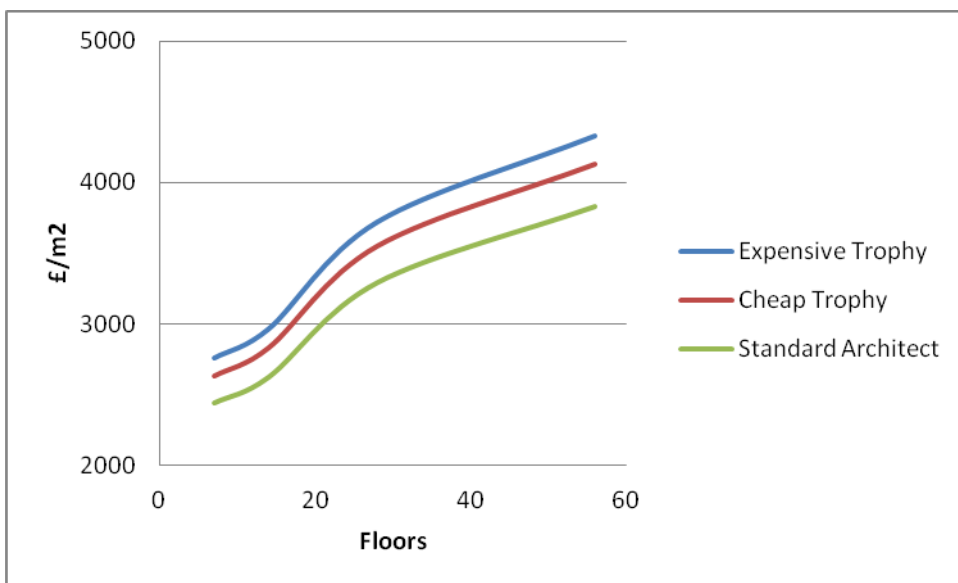
Figure 2: Construction costs per m² and net lettable to gross floorspace as a function of building height



¹¹ As buildings increase in height each floor must allocate a greater percentage of space to structural support, plant operations, and additional lifts. This requirement reduces the ratio of lettable floorspace to gross internal area as the building increases in height. For instance, using our sample of 387 buildings, a regression of the number of lifts on the number of floors, holding footprint constant, shows that on average for every 5-floor increase in height, buildings are provided with 2 additional lifts. It is easy to see how as a building gets taller its lettable office space is gradually 'hollowed out' by these structural requirements

Adding land and design costs to construction costs gives us an estimate for the total building cost. However, trophy architects charge a premium compared to standard architects for their design fees, and the buildings they design will generally incur additional construction costs over-and-above that of a standard building. Estimates for these cost differences were also provided by Gardiner & Theobald. Figure 3 below shows their estimates of the standard total construction cost for a standard office building, and an expensive and 'cheap' trophy architect office building. The expensive and cheap trophy architect buildings assume upper and lower bound estimates for land and trophy construction costs, respectively.

Figure 3: Estimated total land, construction and design costs per m² of building height by type of architect



Costs are for each lettable m², i.e. net of the net lettable-to-gross floorspace estimates

Figure 4: Estimated total land, construction and design costs by architect type as a function of building height

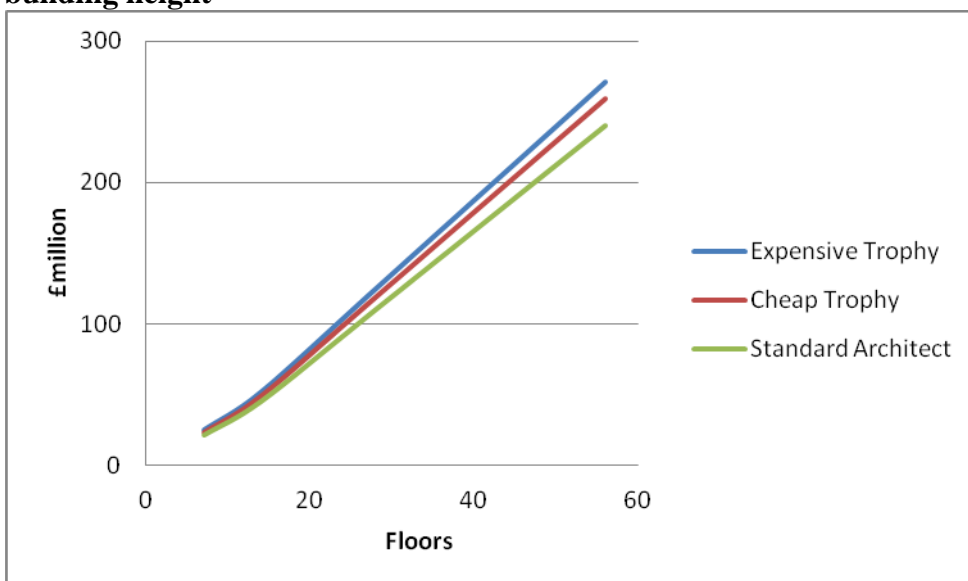


Figure 4, above, then shows how *total* (rather than per m²) building costs increase with the number of floors.

The next step is to derive estimates for the sale price that can be achieved once a building is built and let. To construct these estimates we use the coefficients in Table 6, Model (5), and apply these to the sample means of the 167 buildings sold in City of London throughout the study period, or to the particular values assumed. We assume that the building is designed by a trophy architect, is outside a Conservation Area, is not listed, is brand new (no depreciation age), has A/C, and is Grade A (highest grade measured) office space. Other independent variables are assumed to be their sample means for the City of London. These values are shown in Table 8.

Table 8: City of London means about assumed values

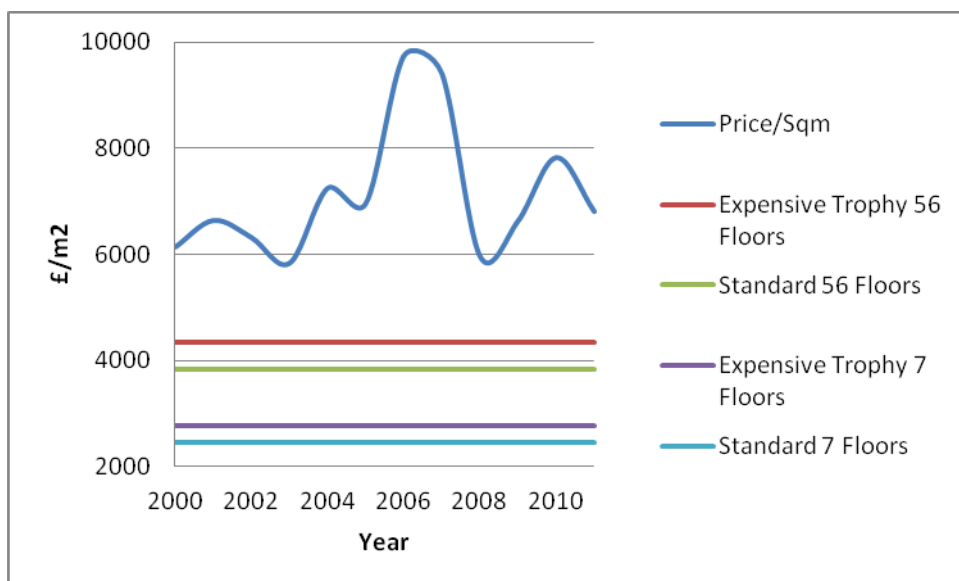
Variable	Actual Value Assumed
Modern Famous Architect	e [†]
Within Conservation Area	1 [‡]
Listed	1
Office Permission Refusal Rate	0.28%
Employment Density 500m	91,718
Conservation Area (m ²) within 300m	123,207
Listed Buildings (m ²) within 300m	34,279
Parks & Gardens (m ²) within 300m	530
Adjacent to a Park	0.07
Distance to Nearest Station (m)	212
Floors	8.25
Depreciation Age	1
Basements per Floor	0.12
A/C	e
Office Space Grade A	e
Percent Occupied	0.89
Multiple Tenants	0.28
Parking Spaces	15

[†]ln(e)=1, i.e. the dummy variable is indicated in log form.

[‡]ln(1)=0, i.e. the dummy variable is not indicated in log form.

Using these assumed values combined with the time-dummy coefficients estimated from Table 6 we calculate an estimated sale-price/m² time-series for this hypothetical building across the study period. The results are displayed in Figure 5 along with estimates for the cost/m² of expensive trophy architect and standard architect buildings by number of floors from Gardiner & Theobald.

Figure 5: Price per m2 for mean characteristics trophy architect building in City of London compared to building costs



Note that construction costs are not assumed to be constant across the period, but are graphed at their current (2012) levels across the entire period for comparison purposes only.

As we can see from the gap between prices and costs in Figure 7, there appears to be considerable rent to be earned from securing planning permission to build 'tall' using a trophy – even expensive trophy - architect. This has been true regardless of market conditions over the last decade. Conservatively assuming a £6,000/m² price achieved at the time of sale¹², on our standardised site the 8-floor building a standard architect provides will earn profits of £32m while the 28-floor expensive trophy architect building will earn profits of £56m. Notice that the trophy architect building earns 75% higher profits, close to the 80% increase in revenues estimated earlier from Table 7, Model (5). Since the two projects are mutually exclusive, if sufficient capital can be raised, then other things equal the 28-floor trophy architect building will yield greater profits and is the superior investment¹³.

These results are formalized in Figure 6 below. On the vertical axis we have marginal revenues from the sale of each additional floor¹⁴. On the horizontal axis we have the number of floors in the building, which is a close approximation to supply. f^r represents the normal height restriction imposed on buildings by local councils, which in the City of London is approximately 8 floors. f^t is the floor height achievable with a trophy architect outside a Conservation Area, which according to our estimates is 28 floors; and f^* represents the number of floors required to equate the marginal cost with the marginal revenue of an additional floor, when profits are maximised. In a partial equilibrium setting and using our cost data we see that standard buildings will achieve this at about 84 floors and trophy architects at about 75 floors. Profit from building f^r floors is $\pi + \pi^*$ (presumably with a standard architect), and profit from building f^t

¹² At current 'prime' and 'grade A' rent levels this would suggest very plausible yields of 8.3% and 7.5%, respectively. Source: Gardiner & Theobald.

¹³ The cost of capital is subsumed in construction costs.

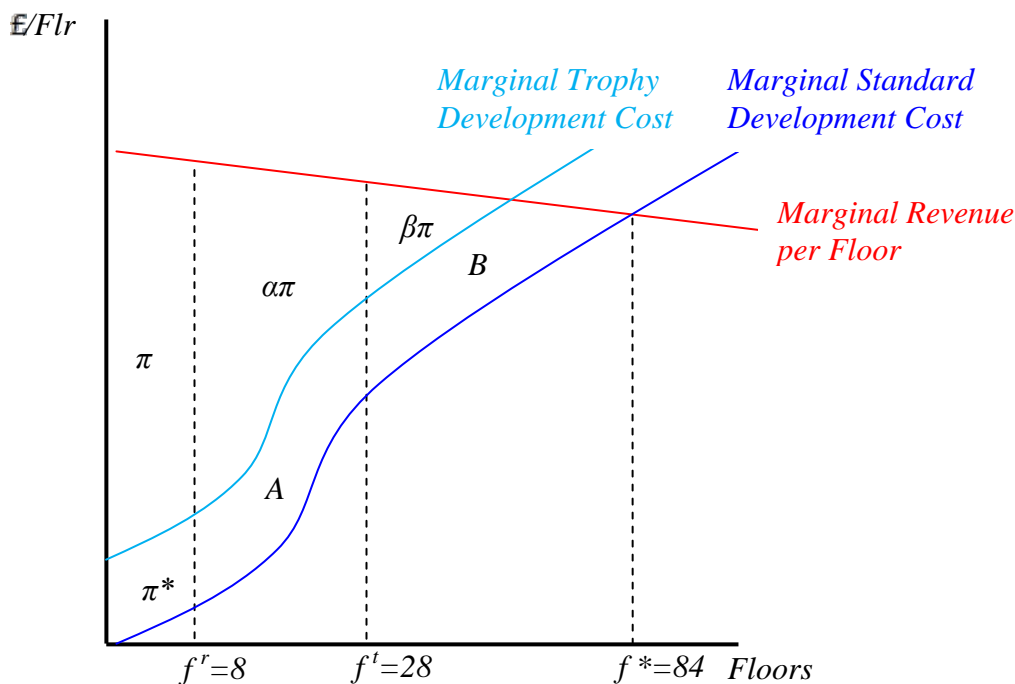
¹⁴ Note that Marginal Revenue per Floor is downward sloping because the net lettable to gross floorspace ratio decreases with building height, not because of assuming a downward sloping demand curve with respect to additional floors. Indeed this is conservative given the premium obtainable for higher floors.

floors with a trophy architect is $\pi + \alpha\pi$. The deadweight¹⁵ loss on the project arising as a result of the increased cost of the trophy architect needed to build f^t floors relative to the standard architect is A . The fact that trophy architects are not allowed to build as tall as would maximise profits leads to the deadweight loss $\beta\pi$. And the total deadweight loss compared to a world with no height restrictions where developers of tall buildings can use the most efficient construction methods is $A + B + \beta\pi$ subject to the caveat in footnote 14.

Taking our office price and cost information we can estimate these additional profits and deadweight losses. Taking our above example we find that; $\pi^* = \text{£}2\text{m}$, $\pi = \text{£}29\text{m}$, $\alpha\pi = \text{£}25\text{m}$, $A = \text{£}35\text{m}$, and $\beta\pi + B = \text{£}44\text{m}$. This suggests that for a new office building in the City of London height restrictions are preventing the developer and therefore society, from realising gains of $\pi^* + A + B + \beta\pi = \text{£}81\text{m}$ for trophy architect buildings and $A + \alpha\pi + B + \beta\pi = \text{£}104\text{m}$ for buildings by standard architects. This represents a loss of 66% of the total cost of the 28-floor famous architect building, and 500% of total cost of the 7-floor standard architect building.

Of course this analysis is only for the gross costs of a single hypothetical building. It represent a partial equilibrium outcome since if restrictions were relaxed the supply of office space would greatly increase and optimal building height would fall. It also and omits the aesthetic and any other external benefits which may arise from building height controls or the use of trophy architects

Figure 6: Rents and Deadweight losses associated with trophy architects and height restrictions



In order to estimate the total net social welfare loss/benefit associated with building height controls and the employment of trophy architects to appropriate resulting rents we would require hedonic estimation of the

¹⁵ In fact the results reported here suggest there could be some external value associated with trophy architect buildings offsetting at least a portion of these deadweight losses: the significant effect on building value, for example, of the concentration of surrounding Listed buildings and Conservation Area designation seems to imply an external value of good design. The problem is that we cannot clearly associate this with trophy architects. With them we can only show they can build taller outside Conservation Areas.

value of these external benefits and estimation of a general equilibrium model of the office market. Although these further extensions are beyond the possibilities of the data, the high costs of the planning controls arising from the most conservative estimates of office value in one of the most permissive local planning authorities in London (The City of London) point to significant potential problems with the current planning regime in terms of overall welfare.

6. Conclusion

This paper provides evidence consistent with Krueger's 1974 analysis. If you have a system of regulation which restricts the supply of some 'good' it will create rents. This provides an incentive for actors to engage in behaviour designed to appropriate those rents: rent-seeking behaviour. In the planning system deployed in London we find that agents can appropriate those rents literally by design. They can employ trophy architects who, where the regime is at all flexible, can use their prestige or superior aesthetic skills to persuade planners and politicians to permit more building space on a given site, notably by allowing a taller building. 'Trophy' architect buildings, indeed, are a lot taller – 20 floors taller – on average. This is because the system is one in which each significant decision is in some sense negotiated. Even if the local jurisdiction rejects the proposal (the evidence suggests there are repeated rejections, followed by negotiations, followed by revised proposals) there is still a process of appeal. This in turn can then be followed by an appeal to the national political process. The Secretary of State (now for Communities and Local Government) can make the final determination for any given proposal although of course this is only worth it for very large and expensive proposed developments.

The extra space a trophy architect can stack on a given site increases the overall sale-price of a typical building they design, on a typical site, by an average of 80%. Using construction cost data from Gardiner & Theobald this paper suggests that a straightforward application of these additional revenues and allowing for the additional direct costs entailed in employing a trophy architect and building a typical trophy architect's building, increases the development profits of an average site in the City of London from £32m to £56m.

This is not an accurate measure of the value of the rents employing a trophy architect generates. Doing so does not just involve additional direct design and construction costs – which we allow for – it involves a significantly longer process and additional uncertainty. These we cannot directly measure. We do not have data on how many trophy architect buildings are conceived and some design plans commissioned but which are never even proposed. We do not have specific data on trophy architect designed proposals which are unsuccessful. Nor do we have a measure of the average time between initial application and final completion associated with trophy as compared to normal architect buildings. Apart from these costs there will almost certainly be a higher discount rate applied for the extra risk and uncertainty gaming the planning system likely entails. All these costs mean that the 'rent' acquired by trophy architects for a typical City of London site is much less than £24m.

The result that famous architects do not increase the sale-price per square metre of office buildings may be new to the literature. Although previous studies we have identified found a positive effect on 'price' of both officially recognized and subjectively 'good' office architecture¹⁶, these studies employed rents and not transaction prices as their dependent variable. As a result they may not capture the additional costs associated with the ownership of an architecturally significant building, including the increased chance in the British context that it will ultimately be Listed. If landlords can pass on some but not all of these additional costs to tenants the result will be lower revenues and sale prices for owners in spite of higher rents for tenants. If true this could reconcile the apparent paradox between this paper's findings and previous research.

¹⁶ Hough and Kratz (1983), and Vandell and Lane (1989).

Rent-seeking behaviour is, in welfare terms, a deadweight loss, reducing welfare. However assuming that, consistent with our findings, famous architects do not increase – even reduce - the per area-m² sale price of office buildings, the existence of external benefits to good architecture – for which we find some supporting evidence - implies that the gap between the sale price (internal benefits) of buildings with good architecture and the total benefits such buildings provide to the public may be positive and significant. To the extent that this is true, good architecture would be underprovided by the private market and developers would require external incentives to employ the services of trophy architects and thereby (potentially) generate some additional external benefits for the public good. The way in which developers who hire trophy architects are able to flex London's regulatory regime to build taller could be regarded as such an indirect subsidy, delivering more good architecture than would the market deliver in the absence of regulation.

Whether this is welfare improving, however, is speculative and beyond the scope of this paper. We note that our evidence does not of itself show any external benefits associated with trophy architects' buildings. Rather it shows there is a possible premium paid per m² for office buildings with a greater density of Conservation Area and Listed buildings within a range of 300m. This is an underestimate of the value attached to such areas and to listed buildings since it relates only to the purchasers of office buildings and does not reflect any value attached by residents or tourists. On the other hand trophy architect buildings are not typically Listed nor are they a reason why neighbourhood is designated as a Conservation Area. Certainly rent seeking and acquisition by employing a trophy architect has costs, many (such as employing lawyers and planning specialists to pursue appeals against initial rejections) of which look like deadweight losses; and if there is a case for more high quality architecture than the market will deliver, it is almost certainly a suboptimal method delivering that increase. It also delivers rents more or less randomly to lucky developers and lucky trophy architects who succeed in flexing the regulations.

References

- Ahlfeldt, G., and W. Maennig (2010). Substitutability and Complementarity of Urban Amenities: External Effects of Built Heritage in Berlin. *Real Estate Economics*, 38(2): 285-323.
- Ahlfeldt, G. and A. Mastro (2013 forthcoming) Valuing Iconic Design: Frank Lloyd Wright Architecture in Oak Park, Illinois, forthcoming in *Housing Studies*
- Arzaghi, M., Henderson, J.V. (2008). Networking off Madison Avenue. *Review of Economic Studies* **75**, 1011-1038.
- Asabere, P., and F. Huffman. (1991). Historic Districts and Land Values. *Journal of Real Estate Research*, 6(1): 1-8.
- Atisreal (2007). House View – London Vs Paris. BNP Paribas.
- Bollinger, C., K. Ihlanfeldt, and D. Bowes (1998). Spatial Variation in Office Rents within the Atlanta Region. *Urban Studies*, 35(7): 1097-1118.
- Cheshire, P., and C. Hilber (2008). Office Space Supply Restrictions in Britain: The Political Economy of Market Revenge. *Economic Journal*, 118(529): F185-F221.
- Cheshire, P. and S. Sheppard (2002) Welfare Economics of Land Use Regulation. *Journal of Urban Economics*, 52(2): 242-296.
- Cheshire, P. and S. Sheppard (2003) 'Taxes versus Regulation: the welfare impacts of policies for containing urban sprawl', in Dick Netzer (ed), *The Property Tax, Land Use and Land Use Regulation*, Cheltenham: Edward Elgar, 147- 172.
- Cheshire, P. and S. Sheppard (2005) 'The Introduction of Price Signals into Land Use Planning Decision-making: a proposal' *Urban Studies*, **42**, 4, 647-663,

- City of London (1994). Conservation Areas in the City of London: A General Introduction to their Character. December, 1994.
- City of London (2002). City of London Unitary Development Plan 2002.
- City of London (2010). City of London Tall Buildings Evidence Paper. September, 2010.
- City of Westminster (2004). The Listing of Buildings of Special Architectural or Historic Interest: A Guide for Owners and Occupiers of Listed Buildings.
- City of Westminster (2004). Supplementary Planning Guidance: Development and Demolition in Conservation Areas.
- Clapp, J.M. & Giaccotto, C. (1999). Revisions in repeat-sales price indexes: Here today, gone tomorrow? *Real Estate Economics*, 27(1): 79–104.
- Commercial Estates Group (2008). Columbus Tower, EIA Scoping Report: Final.
- Cowell, P., Munneke, H., and J. Trefzger (1998). Chicago's Office Price Market: Price Indices, Location and Time. *Real Estate Economics*, 26(1): 83-106.
- Creigh-Tyte, S. (1998). The Built Heritage in England: the History and Development of Government Policy. *Cultural Trends*, 8(32): 26-36.
- Daunfeldt, S., N. Rudholm, and U. Ramme (2011). Congestion Charges in Stockholm: How Have They Affected Retail Revenues? *Transportmetrica*, 0(0): 1-10.
- Dericks, G. (2012) *Essays on the London Office Market*, PhD Thesis submitted to the London School of Economics.
- Evans, A.W. and O.M. Hartwich (2005) *Bigger Better Faster More: Why some countries plan better than others*, London: Policy Exchange
- Frew, J., and D. Jud (1988). "Vacancy Rate and Rent Levels in the Commercial Office Market," *Journal of Real Estate Research*, 3(1): 1-8.
- Garland, R. Department for Communities and Local Government, personal communication, May 11th 2012.
- Gat, D. (1995). Optimal Development of a Building Site. *Journal of Real Estate Finance and Economics*, 11(1): 77-84.
- Hilber, C., and W. Vermeulen (2012) The Impact of Supply Constraints on House Prices in England, SERC DP 116; London, LSE.
- Inwood, S. (2005). *City of Cities: The Birth of Modern London*. MacMillan, London..
- Jennen, M., and D. Brounen (2009). The Effect of Clustering on Office Rents: Evidence from the Amsterdam Market. *Real Estate Economics*, 37(3): 185-208.
- Kennedy, P. (1981). Estimation with Correctly Interpreted Dummy Variables in Semilogarithmic Equations. *American Economic Review*, 71(4): 801.
- Koster, H., Ommeren, J., and P. Rietveld (2011) Is the Sky the Limit? An Analysis of High-Rise Office Buildings. SERC DP 86, London School of Economics.
- Krueger, A. (1974) The Political Economy of the Rent-Seeking Society. *American Economic Review*, 64(3): 291-303.
- Lizieri, C., Reinhart, J., and A. Baum (2011). Who Owns the City 2011: Change and Global Ownership of City of London Offices. University of Cambridge, Real Estate Finance Group.
- Mayo, S. and S. Sheppard (2001) Housing Supply and the Effects of Stochastic Development Control, *Journal of Housing Economics*, 10, 109-128.
- Mayor of London (2002). Interim strategic planning guidance on tall buildings, strategic views and the skyline in London.
- Mayor of London (2011). The London Plan 2011: Spatial Development Strategy for Greater London.
- Noonan, D., and D. Krupka (2011). Making-or Picking-Winners: Evidence of Internal and External Price Effects in Historic Preservation Policies. *Real Estate Economics*, 39(2): 379-407.
- Quddus, M., M. Bell, J. Schmoker, and A. Fonzone (2007). The Impact of the Congestion Charge on the Retail Business in London. *Transport Policy*, 14(5): 433-444.

- Secretary of State for Communities and Local Government (2008). GOL Circular 1/2008, Guidance on the Arrangements for Strategic Planning in London.
- Simon, R.D. (1996) Skyscrapers and the New London Skyline: 1945-1991 [online], *The Electronic Journal of Architecture*. Available at <http://corbu2.caed.kent.edu/architronic/v5n2/v5n2.06a.html> [Accessed 01 July 2012].
- Slade, B. (2000). Office Rent Determinants During Market Decline and Recovery. *Journal of Real Estate Research*, 20(3): 357-380.
- Thibodeau, T. (1990). Estimating the Effect of High-Rise Office Bldgs on Residential Property Values. *Land Economics*, 66(4): 402-408.
- Transport for London (2004). Congestion Charging, Central London, Impacts Monitoring Second Annual Report.
- Turvey, R. (1998) 'Office Rents in the City of London, 1867–1910', *The London Journal*, Vol 23, 2, pp. 53-67
- Vandell, K., and J. Lane (1989). The economics of architecture and urban design. *Journal of the American Real Estate and Urban Economics Association*, 17(2): 235-260.
- VOA (Valuation Office Agency) (2012)

Table A1: Robustness: Omitting tallest trophy architect buildings: dependent variable: Floorspace/site m²

VARIABLES	(1) OLS Full Sample	(2) OLS Omit Tallest	(3) OLS Omit 2 Tallest	(4) OLS Omit 3 Tallest
Trophy Architect outside Conservation Area	3.261*** (0.526)	2.909*** (0.476)	2.842*** (0.609)	2.150*** (0.465)
Trophy Architect	0.135 (0.321)	0.136 (0.321)	0.137 (0.322)	0.140 (0.321)
Built in Conservation Area	-0.483** (0.226)	-0.492** (0.226)	-0.492** (0.226)	-0.494** (0.227)
Average Office Permission Refusal Rate	-14.80*** (3.636)	-14.90*** (3.638)	-14.92*** (3.646)	-15.03*** (3.655)
Built 1950s	0.183 (0.388)	0.182 (0.388)	0.183 (0.388)	0.186 (0.388)
Built 1960s	1.010* (0.595)	1.010* (0.595)	1.010* (0.595)	1.012* (0.595)
Built 1970s	0.699** (0.331)	0.702** (0.331)	0.702** (0.331)	0.706** (0.331)
Built 1980s	0.349 (0.303)	0.359 (0.304)	0.359 (0.304)	0.362 (0.304)
Built 1990s	0.724*** (0.253)	0.739*** (0.255)	0.740*** (0.256)	0.733*** (0.256)
Built 2000s	1.398*** (0.267)	1.402*** (0.267)	1.402*** (0.267)	1.414*** (0.269)
Built 2010s	0.184 (1.068)	0.188 (1.070)	0.189 (1.070)	0.187 (1.079)
City of London	-1.168** (0.510)	-1.172** (0.510)	-1.173** (0.510)	-1.206** (0.516)
Docklands	1.865*** (0.642)	1.680** (0.702)	1.679** (0.702)	1.673** (0.703)
Average Employment 500m	1.45e-05** (6.43e-06)	1.44e-05** (6.44e-06)	1.43e-05** (6.47e-06)	1.46e-05** (6.50e-06)
Constant	5.403*** (0.520)	5.418*** (0.520)	5.421*** (0.522)	5.429*** (0.523)
Observations	387	386	385	384
R-squared	0.278	0.250	0.236	0.225

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

**Table A2: Robustness: Omitting tallest trophy architect buildings:
dependent variable: No. floors/site m²**

VARIABLES	(1) OLS Floors Full Sample	(2) OLS Floors Omit Tallest	(3) OLS Floors Omit 2 Tallest	(4) OLS Floors Omit 3 Tallest
Trophy Architect outside Conservation Area	20.01*** (5.880)	16.11** (6.478)	8.436*** (2.374)	5.142*** (0.741)
Trophy Architect	-0.703 (0.574)	-0.697 (0.570)	-0.579 (0.566)	-0.564 (0.566)
Built in Conservation Area	-1.109*** (0.270)	-1.205*** (0.255)	-1.225*** (0.253)	-1.235*** (0.253)
Average Office Permission Refusal Rate	3.909 (10.41)	2.725 (10.32)	0.643 (10.16)	0.131 (10.18)
Built 1950s	1.346*** (0.363)	1.341*** (0.362)	1.369*** (0.364)	1.384*** (0.365)
Built 1960s	5.327*** (1.472)	5.324*** (1.475)	5.319*** (1.480)	5.333*** (1.480)
Built 1970s	2.405*** (0.673)	2.439*** (0.670)	2.466*** (0.669)	2.485*** (0.670)
Built 1980s	0.262 (0.309)	0.364 (0.290)	0.403 (0.284)	0.418 (0.284)
Built 1990s	1.168*** (0.351)	1.335*** (0.337)	1.510*** (0.314)	1.477*** (0.312)
Built 2000s	2.018*** (0.357)	2.061*** (0.331)	1.994*** (0.315)	2.056*** (0.313)
Built 2010s	1.323 (1.563)	1.369 (1.583)	1.449 (1.591)	1.443 (1.633)
City of London	0.0445 (1.286)	-0.00486 (1.248)	-0.160 (1.211)	-0.313 (1.216)
Docklands	4.184** (1.961)	2.141** (0.965)	1.982** (0.950)	1.954** (0.953)
Average Employment 500m	3.20e-05*** (1.21e-05)	3.05e-05** (1.21e-05)	2.59e-05** (1.17e-05)	2.73e-05** (1.17e-05)
Constant	4.714*** (1.255)	4.883*** (1.250)	5.251*** (1.219)	5.289*** (1.220)
Observations	387	386	385	384
R-squared	0.468	0.369	0.282	0.260

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table A3: Can Trophy Architects build broader?: dependent variable footprint/site m²)

VARIABLES	(1) OLS	(2) OLS	(3) OLS	(4) IV2SLS
Trophy Architect outside Conservation Area	9.19e-05 (0.127)	-0.0367 (0.125)	-0.0451 (0.128)	-0.0680 (0.144)
Trophy Architect	-0.0938 (0.0655)	-0.0792 (0.0678)	-0.0874 (0.0614)	-0.110** (0.0501)
Built in Conservation Area	0.0682*** (0.0159)	0.0657*** (0.0175)	0.0631*** (0.0171)	0.0557*** (0.0201)
Average Office Permission Refusal Rate	-0.610*** (0.132)	-1.377*** (0.474)	-1.285*** (0.453)	-1.032** (0.464)
Built 1950s	-0.0145 (0.0252)	-0.00843 (0.0236)	-0.00619 (0.0259)	-8.72e-05 (0.0341)
Built 1960s	-0.147*** (0.0491)	-0.141*** (0.0488)	-0.133*** (0.0508)	-0.110* (0.0585)
Built 1970s	-0.161*** (0.0451)	-0.149*** (0.0449)	-0.144*** (0.0431)	-0.131*** (0.0419)
Built 1980s	-0.0637*** (0.0204)	-0.0591*** (0.0225)	-0.0581*** (0.0219)	-0.0555** (0.0231)
Built 1990s	-0.0756*** (0.0215)	-0.0677*** (0.0242)	-0.0705*** (0.0238)	-0.0783*** (0.0254)
Built 2000s	-0.0485** (0.0189)	-0.0445** (0.0218)	-0.0430** (0.0217)	-0.0391 (0.0239)
Built 2010s	-0.0897*** (0.0139)	-0.0939*** (0.0181)	-0.112*** (0.0356)	-0.163* (0.0970)
City of London		-0.101* (0.0547)	-0.153** (0.0592)	-0.293** (0.141)
Docklands		0.0472 (0.0374)	0.0592 (0.0390)	0.0920* (0.0526)
Average Employment 500m			1.54e-06** (6.09e-07)	5.76e-06 (3.75e-06)
Constant	1.030*** (0.0130)	1.124*** (0.0521)	1.078*** (0.0511)	0.952*** (0.116)
Observations	387	387	387	387
R-squared	0.183	0.201	0.220	0.075

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A4: Robustness: Omitting tallest trophy architect buildings: dependent variable Ln(Price/site m²)

VARIABLES	(1) OLS Full Sample	(2) OLS Omit Tallest	(3) OLS Omit 2 Tallest	(4) OLS Omit 3 Tallest
Dependent variable:	Ln(Price/site m ²)			
Trophy Architect outside Conservation Area	1.156*** (0.318)	1.031*** (0.320)	0.956*** (0.322)	0.932*** (0.330)
Modern Trophy Architect	-0.438 (0.295)	-0.428 (0.296)	-0.424 (0.297)	-0.422 (0.296)
Pre-Modern Trophy Architect	-0.382*** (0.142)	-0.378*** (0.142)	-0.381*** (0.142)	-0.382*** (0.142)
Within Conservation Area	-0.0530 (0.0819)	-0.0536 (0.0822)	-0.0548 (0.0823)	-0.0550 (0.0825)
Built in Conservation Area	-0.0355 (0.0957)	-0.0405 (0.0961)	-0.0391 (0.0962)	-0.0404 (0.0965)
Listed Bldg	-0.140* (0.0779)	-0.139* (0.0777)	-0.138* (0.0776)	-0.138* (0.0777)
Ln(Office Permission Refusal Rate 9yr Moving Av.)	0.0132 (0.0202)	0.0135 (0.0202)	0.0134 (0.0202)	0.0140 (0.0202)
Ln(Employment Density 500m)	0.204*** (0.0512)	0.193*** (0.0523)	0.192*** (0.0523)	0.193*** (0.0525)
Ln(Conservation Area Density 300m)	-0.0166 (0.0145)	-0.0173 (0.0144)	-0.0172 (0.0144)	-0.0172 (0.0145)
Ln(Listed Bldg Density 300m)	0.0323* (0.0194)	0.0504** (0.0211)	0.0506** (0.0209)	0.0527** (0.0208)
Ln(Park and Garden Density 300m)	0.0169*** (0.00381)	0.0169*** (0.00378)	0.0170*** (0.00378)	0.0170*** (0.00383)
Adjacent to Park or Garden	0.156** (0.0696)	0.146** (0.0700)	0.149** (0.0703)	0.148** (0.0720)
Ln(Nearest Rail Station Distance)	-0.00992 (0.0500)	-0.000209 (0.0507)	1.12e-05 (0.0507)	-0.000338 (0.0510)
Ln(Depreciation Age)	-0.0132 (0.00930)	-0.0133 (0.00931)	-0.0133 (0.00931)	-0.0135 (0.00929)
Ln(Basements/Total Floors)	-0.0182 (0.0134)	-0.0181 (0.0135)	-0.0176 (0.0135)	-0.0172 (0.0136)
A/C	0.449*** (0.130)	0.443*** (0.127)	0.444*** (0.127)	0.444*** (0.127)
EG Office Grade A/B	0.265*** (0.0657)	0.263*** (0.0657)	0.261*** (0.0656)	0.262*** (0.0658)
EG Office Grade A	0.361*** (0.0588)	0.368*** (0.0587)	0.370*** (0.0589)	0.371*** (0.0590)
Ln(Percent Occupied)	0.0260* (0.0140)	0.0264* (0.0140)	0.0263* (0.0140)	0.0261* (0.0139)
Multiple Tenant Bldg	-0.00807 (0.0506)	-0.00210 (0.0509)	-0.00193 (0.0509)	-0.00334 (0.0511)
Ln(Parking Spaces)	0.00803 (0.00510)	0.00824 (0.00508)	0.00811 (0.00508)	0.00822 (0.00510)
Decade Built	YES	YES	YES	YES
Submarket Dummies	YES	YES	YES	YES
Quarter Sold	YES	YES	YES	YES
Constant	7.010*** (0.560)	6.991*** (0.569)	7.006*** (0.569)	7.049*** (0.578)
Observations	513	511	510	507
R-squared	0.611	0.607	0.602	0.600

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1