

OVERSPECIFICATION OF SPECULATIVE UK COMMERCIAL OFFICE BUILDING: AN INTERNATIONAL COMPARISON

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There is a view expressed by some authors that the UK is currently overspecifying speculative commercial office space. Comparative studies between the costs of constructing speculative office buildings in the UK and those constructed abroad have indicated the existence of many cost differentials that have not been further investigated. This paper illustrates the different levels of standards and specifications typically used in the construction of a medium sized, six storey office block in the UK based on a questionnaire survey with those same standards used in Australia, North America, Japan, France, Germany and the UK. A comparison was made using a questionnaire, with five other countries having a similar climate and/or enjoying similar levels of economic development. This paper illustrates the major similarities and differences that currently exist between standards and specifications in speculatively built six storey office within the six countries and posit reasons for these differences.

Keywords: Commercial buildings, international comparison, overspecification.

INTRODUCTION

This paper illustrates the findings of a six month research project funded by industry, examining the apparent overspecification of speculative UK office buildings in comparison to identical buildings specified in France, Germany, North America, Australia and Japan. The research aims and objectives are defined, prior to a definition of terms for the research, a description of what overspecification is and the reasons why it can be detrimental to the UK commercial office market for investors and occupants. The paper goes on to discuss the research method adopted for the study along with the data collection and analysis. Finally the findings of the study are set out and conclusions are drawn about the extent and nature of apparent overspecification of speculative office space in the UK.

OVERSPECIFICATION OF COMMERCIAL OFFICE SPACE

What is meant by the term ‘overspecification,’? Although the term is used along with ‘overdesigned’ and ‘overengineered’, design and engineering may refer to either different stages or very specific parts of the construction process. We were concerned with ‘overspecification’ in terms of what is finally specified and constructed. Literally, ‘over’ means ‘to a very high or extreme degree of quality’. For the purposes of this research overspecification is deemed to mean, to detail the description of the features in the design or composition or a single of a number of components or finishes to a very high or an extreme degree of quality. In effect, to go beyond what is required by legislation in terms of safety or health.

The term first appears in the UK in studies undertaken during the boom of the late 1980's. The British Council for Offices (B.C.O., 1994) claim there was a trend in the 1980's to design and construct speculative office buildings to excessive specification, assuming that buildings could be adapted for any occupier. The result was excessive specification and wastage as superfluous fixtures and fittings were stripped out, unused, by incoming tenants. During the boom of the 1980's such wastage may have been absorbed by the industry and the market, however in the lean, post Latham (1994) nineties, the construction industry is looking to trim off any fat, and cut any wastage.

There is a view that the UK needs more 'efficient' buildings and 'needs to pay less for them in order to continue to be competitive in world markets.' (Value for Money, 1996). If UK buildings are unnecessarily overspecified there may be an opportunity to reduce specifications and consequently costs, thus making the UK more competitive as Banham claims is necessary.

Influential reports, such as the Latham Report (1994, p5), drew attention to the perceived overspecification in UK buildings, as well as the need to reduce construction costs by 30% to remain internationally competitive. The concern is that "if these changes [identified by Latham] are not made, once the economy is stronger we will lose out to overseas competition" (Davis, 1994).

An analogy has been drawn with MacDonaldis, the fast food retailer, which has a standard specification and fast track construction method for their restaurants. The standardisation of specification and production allow the company to purchase a plot of land and open a restaurant quickly. All construction and materials costs are agreed with a selected number of sub-contractors thereby reducing the traditional tendering period and costs. On site construction has been reduced from 115 to 15 days (Latham, 1994, p63). The hypothesis is that if MacDonaldis can operate like this with restaurants, then others may seek to operate on a similar basis with speculative office accommodation.

Previous reports have focused on cost comparisons with overseas countries, but have revealed differences related to the specification and construction methods which result in cheaper buildings. Lynton's report, *The UK Construction Challenge* (1993), established the costs of building identical airport terminal buildings in Charlotte, North Carolina and Heathrow. Similar input costs were noted (labour, supervision, and basic materials) however taxation varied, with the UK's VAT applied at 17.5% and Charlotte having a 3% additional cost due to sales tax applying to some materials only. The first comparison was based on an identical specification and produced more or less equal costs.

The second comparison in the Lynton report was based on a specification likely to apply to the US which produced an American version, cheaper by 8%. The final comparison was based on a specification to maximise cost savings and produced a building some 32% cheaper than the UK counterpart. The major differences lie in the electrical and mechanical specification and the use of standardised components.

There has been criticism of the findings of the study. Though Lynton state the study shows labour and materials and productivity rates to be parable, Peter Rogers at Stanhope was sceptical about the parability of productivity rates (*Building*, July 1993). Further limitations of the research are the regional variations in pricing, as well as the considerable fluctuations in price which can occur in the construction industry. Nicholas Grimshaw the architect for the study building, raises another important point

about the Lynton study, claiming the results are 'spurious' because the third comparison, is not a case of comparing like with like, and that the US version would not last as long as the UK counterpart.

Grimshaws' point raises the question about the life cycle of buildings and, whether short life buildings offer more value for money in an ever-changing world, than long life flexible buildings. However the point though interesting would, if pursued too rigorously take the research away from its original focus. Patently Lynton shows that there is evidence and concern about the level specification in the UK and the additional costs that may result.

THE AIMS AND OBJECTIVES OF THE RESEARCH

This study had three aims. The primary aim was to ascertain whether the UK is currently overspecifying speculative office buildings compared to five overseas competitors. Secondly, the research aimed to identify which parts or elements of the building, if any, were being overspecified. Finally, the research sought to gain a deeper understanding of the reason for any overspecification which may be occurring and to suggest, if appropriate, what measures might be appropriate to reduce overspecification.

The limitations of the study was to look at medium sized speculative office building, of six storeys, such as would be found in a large satellite town such as Reading, for example. By restricting the research initially to a typical speculative design, the study would be applicable to a greater number of buildings in preference to a focus on large Multi storey buildings that may only be constructed in a few large city centres.

The time frame of six months limited the study in terms of depth and breadth. The study was limited to six countries which were selected on the basis of sharing a broadly similar climate to the UK and having a similar level of economic development. However these countries do not have similar property markets in all instances and it is acknowledged that this factor affects the specification in some cases. Due to the restrictions on time to collect and analyse data, three questionnaires were sent to practices in each country for completion and consequently the findings cannot be claimed to be statistically representative of office specification, rather more indicative of what is sometimes provided.

DISADVANTAGES OF OVERSPECIFICATION

There is evidence that the tenant suffers from overspecification (BCO, 1994) financially through increased running costs and also occupant health. An example given is of overspecified electrical power loads which require equally overspecified air conditioning units to remove the extra heat gain, the effectiveness of both units is reduced and higher running costs are passed onto the tenants. There is evidence that some installations designed to 'provide at least 75W/m² cooling capacity, whereas.... 25W/m² is more than adequate' (Stanhope Properties, 1993), which implies overspecification in the order of three times beyond what is required.

Linked with this particular aspect of overspecification was the increase in small power loads from 5-10W/m² to 25-40W/m² in London during the 1980's and a raise in complaints from occupiers about the quality of the internal environment caused by the air conditioning units running ineffectively (Stanhope, 1993, p3.). The conclusion is that tenants are paying more for a less effective system, one which has a potential capacity to deal with greater loads which it is unlikely to be required to deal with.

Why are small power loads being specified at such levels? There is no statutory requirement for small power provision in the UK relating to offices, which means that projects are designed to meet the aspirations of the market and it is the market which is driving up the specifications.

THE ROLE OF THE MARKET IN OVERSPECIFICATION

In the UK when a developer decides to develop land into office space, the company is likely to have discussions with local property agents to discuss the market for their building in that particular location. They will need to identify what the local market expects in terms of parking provision, services, finishes, floor loading, mechanical or natural ventilation and so on. The developer should look at similar buildings in the locality to ascertain current rental values, and to identify who prospective tenants and purchasers might be.

Once this information is obtained the brief can be formulated which will link the capital sum and payback period for the project along with the developers profit. In this scenario it is clear that the letting agent could be influential in deciding not only the finishes and services elements of the design, but also structural design such as floor loading. In a competitive market, such as we have had in the UK in the early 90's, each building is competing to be noticed and differentiate itself in some manner. It is our assertion that such a market can drive up the specification to unnecessary levels and consequently increase costs (Strohm, 1995)

THE RESEARCH METHOD

The research is qualitative, sharing the three basic assumptions identified by Patton (1980) of being naturalistic, holistic and inductive. Naturalism involves observing the phenomenon in its natural occurring state, in this case by using a questionnaire to collect data from practitioners about what they currently specify, and not by asking what they could or should specify but what they do specify. The holistic aspect involves looking at the whole problem to develop a more complete understanding of the influencing factors and the variables which determine whether or not, and why overspecification in the UK is occurring. The inductive approach is derived from the literature review whereby a picture of the problems and issues emerge as the researcher becomes more familiar with the topic area. The literature review identified which areas needed to be addressed in the questionnaires.

The researchers described briefly the type of building they wanted respondents to consider when answering the questions. It was decided to consider the specification of a reinforced concrete or steel framed speculative office, 6 storeys high, located in a medium sized satellite town of around 100,000 population. The reason was that this is a fairly typical speculative project which professionals are likely to have been involved with.

A thorough discussion about the information which the researchers sought to collect preceded the decision to use a questionnaire approach to data collection. For the purposes of this study overseas visits and interviews were considered time consuming and expensive as well as presenting potential language problems. It was more appropriate to gain an understanding of the construction industry and property market in each country through a desk top study prior to developing a questionnaire.

The other possible method was to use a case study approach, using either a questionnaire or an interview method, however this would have focused specifically

on individual examples rather than allow the research population to generalise about what 'normally' or typically happens when they specify speculative office buildings. A limitation of the case study technique is that the researcher does not sample widely enough and that studies may represent the peripheries and not the average (Robson, 1993, p153), although Yin (1989) observes that case study is concerned with analytical and not statistical generalisation.

The criticism of a questionnaire approach is that the information gathered may be superficial. Care has to be taken in selecting the question type, in question writing in the design and piloting distribution and return of the questionnaires (Bell, 1995 p75). For this reason the questionnaire was developed by the two researchers in conjunction with the experienced working professionals who constitute the task force at the Reading Construction Forum. Several meetings were held to discuss the questionnaire design, the research population, the distribution and the piloting of the questionnaire.

The questionnaire was piloted by professional staff working within the Forum members practices to assess, whether questions were understood as intended, and easy to answer. The questionnaire was designed to be answered by working professionals with a knowledge and experience of speculative office design and were targeted at practices and individuals. Consent was obtained prior to questionnaire distribution to ensure a good responses rate was achieved. Despite these actions, the response to the questionnaire was poor and is discussed further in the data collection section below.

The researchers wanted to obtain factual information regarding what provisions are made in the specification of speculative office buildings in six key areas. These areas had been identified by authors as areas where overspecification was deemed to occur or areas which no previous authors had looked at. The areas were divided as follows; landlord and tenant issues; population and occupancy issues, fire engineering issues, floor loading, building envelope and fabric and services. The researchers wanted to discern the differences between what was required by legislation and what was provided by 'convention' in the market place, therefore some questions had two columns or sections, in order to distinguish between the two factors.

Due to the international scope of the study much time was spent discussing the question wording to eliminate misunderstanding, ambiguity and assumption. A glossary was developed for the terms and words which the researchers and Forum members considered potentially problematic and included on the cover page of the questionnaire.

The layout and presentation of the questionnaire was important (Bell, 1995. p81) if it was not to lose impact. The questionnaire was laid out clearly, with the general aims of the research identified to set the questions in context for the respondents. Adequate space was left between questions to avoid confusion. Finally considerable discussion went into the structure of the questions used in the questionnaire. The questionnaire was divided into six parts as described above, however each part started with a section asking for personal details in order to ascertain the professional background of the respondent, experience, company and position within the company. This information is non threatening and easy to answer, and a technique recommended (Moser & Kalton, 1979) to put respondents at their ease to begin with. The more demanding questions follow and this structure was adopted in this instance. Having respondents identify their professional background and nationality proved important in the analysis section as the researchers were able to discuss these details in the light of responses given.

It was decided that due to the complexity of the questionnaire and the prior agreement of respondents to be part of the research, that the six part questionnaire was sent out to three organisations involved in the design and specification of medium sized speculative commercial building in each country. Responses from the three respondents for each country would provide for reliability and validity for the research.

DATA COLLECTION

This section looks at the response rate to the questionnaires. Despite the prior contact made by the researchers the response rate to the questionnaires was disappointing in terms of timescale and numbers. Those questionnaires which were returned were, on occasion only partially answered, and this involved time consuming efforts to complete data collection. An additional Forum meeting was held to discuss ways of ensuring adequate completion of the questionnaires to ensure validity and reliability of the research.

The main problem was that for Japan, Australia and the UK, there were two of three completed returns, and that a third party was required to try to resolve the few responses which were quite different. For the US, France and Germany only one completed and returned questionnaire was received for each country. For these latter three countries additional responses are necessary to ensure validity and reliability. Forum members agreed to contact individuals to obtain additional information. At the time of writing, this process of final data collection is ongoing and the completed data is expected shortly. Thus the findings stated in this paper are provisional, the additional information may alter some aspects of the findings but are unlikely to alter substantially the overall conclusions regarding overspecification.

DATA ANALYSIS

This section sets out the initial findings and data analysis from the questionnaire returns by reviewing each part of the questionnaire. Respondents were selected on the basis of experience and knowledge, and were asked about provisions they generally make for speculative office design, to make the data more representative about normal practice in each country. For the purposes of this paper, the authors have been selective about the data included and have intended to show areas where there is consistency among the countries, as well as data which reveals the differences.

Part 1/6 looked at landlord and tenant issues such as lease type, duration, level of fit out provided in speculative office space and system of measurement used. Table 1 below illustrates the summarised findings.

Table 1 Lease terms	UNITED KINGDOM	JAPAN	UNITED STATES OF AMERICA	AUSTRALIA	FRANCE	GERMANY
<i>lease terms (years)</i>	25, 5 yr rent review upward only	2, can re-negotiate after 2	5 + 5	5 + 5 renegotiate when both parties wish	9 (opt out in yr 3 + 6)	
<i>lease covenants</i>	Full Repairing & Insuring	no particular type	repair to tenant fit out	repair to tenant fit out	partially repairing	repair to tenant fit out
<i>fit out provided</i>	Category A	shell & core	shell & core	suspended ceilings, WC's, lobby	lift, suspended ceiling	shell & core
<i>measurement system used</i>	RICS	No particular type used	BOMA	BOMA	SHOB	DIN

key: BOMA - Building Owners and Managers Association

DIN - German equivalent of British Standards Institution

SHOB - Surface hors oeuvres brut (roofs terraces, balconies, loggias, covered open areas, walkways, minor canopies, open air parking, external wall (including half party wall) thickness, unusable roof space and basements, plants areas in the roof and basement, basement parking areas = UK Gross external floor area bar roofs terraces, balconies, loggias, covered open areas, walkways, minor canopies, open air parking,)

It is apparent that the UK has longer lease terms and more onerous repairing covenants for tenants than the other countries where the most common fit out is shell and core. However the interpretation of what shell and core constitutes varies from country to country. The UK traditionally opts for a full fit out with raised access flooring, suspended ceilings, floor finishes, WC and lift lobby areas fully decorated, provision of lighting, distribution ducting for air conditioning and services and wall finishes to common and office areas. This data shows a higher degree of initial fit out for UK offices.

As far as the measurement of offices is concerned each country adopts its own system, bar the US and Australia, who use the American Building Owners and Managers Association (BOMA) system. As the key illustrates this variety of measurement systems is an additional variation between the rental value measured and also costs calculated per metre, from one country to another.

The second part of the questionnaire examined the issues surrounding population and occupancy of buildings by reviewing conventions and legislation relating to space provision per person and standard plan sizing. The summarised findings from this section of the questionnaire are illustrated in Table 2.

TABLE 2 Occupancy	UNITED KINGDOM	JAPAN	UNITED STATES OF AMERICA	AUSTRALIA	FRANCE	GERMANY
<i>type of space</i>	full reversibility	full reversibility / open plan	open plan	full reversibility / open plan	full reversibility / open plan	cellular
<i>plan depths</i>						
<i>window to window</i>	15 - 18m	26m	-	20m		2 x 1.25m
<i>window to core</i>	7.5 - 12m	13 - 17m	40' 0" (12m)	10 - 12m	-	6.5m
<i>window to atria</i>	15 - 18m	-	-	12m	-	-
<i>convention / legislation</i>	convention	convention	convention	convention	convention	convention
<i>standard planning grid</i>	yes	yes	yes	yes	no	no
<i>conventional column grid</i>	yes	no	no	yes	yes	no
<i>typical floor/ floor height</i>	3.8 - 4.2m	3.8 - 4m	12' 6" (3.75m)	3.95m	2.5 - 3.2m	4m

The results reveal much commonality between the conventions of each country regarding the type of space provided and the amount of space generally allocated. Further consistency was noted to areas for occupational density for example where an average of 10-14m² is allowed per person and the provision of single sex WC accommodation. Lift car capacity was larger for the UK, US, Japan, Australia, and Germany, with around 15-20 person cars provided, whereas the French provide 8 person or less for lift cars.

Variations were noted to the amount of facilities provided in speculative office buildings. The UK, US, and Australia provided no additional facilities, whereas the Japanese provide tea making facilities, the French provided dining space, sickrooms, and smoking rooms, whilst the Germans would appear to be the most generous including conference, storage and tea making space.

The third part of the questionnaire related to fire issues asking respondents about distances provided to escape stairs and routes, about provision of sprinklers for fire fighting and about evacuation procedures. Further questions related to amount of fire resistance provided to various elements of the building. Table 3 shows the amount of fire resistance made.

TABLE 3 Fire Engineering	UNITED KINGDOM	JAPAN	UNITED STATES OF AMERICA	AUSTRALIA	FRANCE	GERMANY
Fire resistance in hours:						
roof	0.5	0.5	1	1	-	0.5
steel frame	1 -1.5	1	2	2	-	1.5
concrete frame	1 - 1.5	1	2	2	-	0.5

there is similarity, noted in Table 3, between the US and Australia. Germany, the UK and Japan having slightly less onerous requirements. It is unclear why Germany provides only 30 minutes protection to concrete framed buildings whilst others provide between two to four times that amount of protection. Such safety requirements may be influenced by institutional investors/insurers to a lesser extent in Germany. The UK specification for fire resistance appears closest to the Japanese. There was reasonable consistency regarding the provision of fire fighting lifts in office buildings which appears necessary when the building height exceeds 25m in height.

Floor loading was covered by part four of the questionnaire and was considered initially to be an area where overspecification was likely to occur. Discussions with experienced engineers revealed that whilst 2.5KN/m² of floor loading was generally structurally sufficient, many client and institutional lenders ask for loading of up to 5KN/m², resulting in unnecessary additional loading of the floor and subsequently the columns and foundations of the building. Respondents were asked if there was any differentiation between floor areas when designing for loading. Each country made allowances for different loads except the UK which applies a uniform loading throughout the floor. Interestingly all countries who supplied information to the question of minimum and conventional floor loading revealed differences between the legislative minimum's and convention. Conventional provisions for floor loading were generally between 2.5 KN/m² - 5 KN/m² with the UK showing the highest floor loading.

TABLE 4 floor loading	UNITED KINGDOM	JAPAN	UNITED STATES OF AMERICA	AUSTRALIA	FRANCE	GERMANY
Min loads designed for in floor of office buildings :- legislation	2.5 KN/m ²	3 KN/m ²		3 KN/m ²	2.5-KN/m ²	2.5 KN/m ²
convention	4 +1 KN/m ²	3 KN/m ²		3 KN/m ²	2.5-KN/m ²	3.0 KN/m ²

The building envelope, covered by part 5 of the questionnaire, was an area likely to reveal different levels of specification indicated by BSRIA's 'Overengineering' report. The main differences stem from the guidelines adopted by each country when specifying. Only the UK had minimal thermal resistance targets for separate elements of a building. All the other countries used in the study either did not have minimum design guidelines, or based their calculations on a total perimeter calculation / energy balance for the entire envelope. From initial examination it would appear that the CIBSE design guide may be more onerous in parts, a fact which supports the findings of BSRIA's Overengineering report.

Table 5 Building envelope	UNITED KINGDOM	JAPAN	UNITED STATES OF AMERICA	AUSTRALIA	FRANCE	GERMANY
Min thermal resistance						
Roof	0.25/0.45	perimeter annual load		non currently		Total energy balance for the whole building.
Walls	0.45	less than mcal / m ² pa. Japan version				
Windows	3.3					
Floors	0.45					
Methods used for calcs	CIBSE	Japan version		N/A	French version	German version
Any insitu tests for air and noise infiltration.	Air = Yes Noise = Yes	Air = No Noise = No		Air = No Noise = No	Air = No Noise = if required	Air = No Noise = Yes

The sixth part of the questionnaire related to the level of service provisions that are commonly made in design of office buildings and targeted lighting, small power, and ventilation provisions within office design. Table 6 shows the levels of lighting installed within speculative office buildings and reveals that the UK generally specifies a lower level of provision.

Table 6 Levels of lighting normally specified for the following:	United Kingdom	Japan	United States of America	Australia	France	Germany
Open plan offices	500 Lux	500-750 Lux		500 Lux	400 Lux	300 Lux
Conference rooms	300-500 Lux	500 Lux		500 Lux	500 Lux	300 Lux
Main entrance	200-500 Lux	200 - 500 Lux		400 Lux	200 Lux	500 Lux
WC facilities	100-150 Lux	100-200 Lux		400 Lux	100 Lux	200 Lux
Computer stations	300-350 Lux	500 - 1000 Lux		400 Lux	500 Lux	300 Lux
Archive / storage rooms	100-200 Lux	100 - 300 Lux		400 Lux	200 Lux	200 Lux
Executive offices	300-500 Lux	500 - 1000 Lux		500 Lux	300 Lux	300 Lux

CONCLUSIONS

The primary aim of the study was to ascertain whether the UK is overspecifying speculative office buildings compared to overseas competitors. To achieve this aim the questionnaire was detailed and contained a large number of questions of both a scientific and technical nature. The returns provide evidence that there is overspecification in the UK compared to other countries in certain areas, for example floor loading. In other areas the UK appears to specify to a more common level of provision, such as space allocated per person, and lift car capacity generally provided. The primary aim has been partially met by the data collected.

The second aim was to identify where overspecification, if any, occurs. This has been satisfied to some degree by the data collection and example are noted in the data analysis section above. However there are a number of areas still requiring data collection and clarification to make the study complete. The nature of some questions and amount of detail required in order to give an accurate answer meant that some questions were returned either misunderstood or incomplete. In some cases answers given to questions differed to those given by other companies answering for the same country. These factors have made difficulties in drawing accurate comparisons in all the areas originally intended. The findings in this paper have to be viewed as

indicative and the results cannot be taken as being representative of any country as a whole. Further data collection and verification is ongoing to ensure the validity of the final published research.

The third aim was to gain a deeper understanding of the reason for any overspecification which may be occurring and to suggest, if appropriate, what measures might be appropriate to reduce overspecification. This aim has not been achieved at present but is still part of the research study.

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