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Analysing the types of procurement used in the UK: a comparison of two data sets.

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ABSTRACT

Davis Langdon and Everest (DLE) have published the results of a triennial survey on contract use since 1984. As a regular survey on the subject, this has been regarded as one of the main sources of information on contract use for surveyors and others involved in construction procurement.

However, since the early 1980s Emap Glenigan (EG) has also produced marketing information based on planning applications. This information is sent to firms in the construction and property sectors. The data includes the value of projects and the types of procurement system used. Whereas the DLE data is based on a non-random sample, the EG data (used in this paper) is a census of all projects valued at over £100,000.

The EG data on contract use has recently been made available for analysis and a comparison of the EG and DLE data sets has been used to verify the DLE survey results. The comparison of the EG and DLE data shows that at the 95 per cent confidence level there is no significant difference in the two sets of data in terms of the share of contracts used by number of projects. The EG data confirms the DLE findings that the traditional procurement system remains by far the most popular method, followed by design and build. The other forms of procurement in aggregate

only form a small percentage of construction transactions. However, differences between the two sets of data in terms of the share in the total value of projects represented by different contract types are shown to be significant.

As the DLE data represents a non-random sample of quantity surveying practices and the EG data is based on responses from contractors, developers and local authorities, differences in the proportion of contracts could reasonably be expected. The paper concludes that the EG data on the value share of contracts for new construction only is preferred to the results of the DLE survey, but the DLE survey may better reflect the value shares of all work including repair and maintenance.

Keywords:

procurement systems, construction contract use, traditional contracting, design and build.

INTRODUCTION

The construction industry is fragmented. It is divided into several separate trade specialisms, with labour employed on a casual basis and plant hired only as and when required for particular projects. The firms, too, are divided between main or general contractors and sub-contractors. The separation of clients, general and sub-contractors necessitates contractual arrangements between them for construction work to be undertaken. The various configurations of contractual networks coupled with the patterns of risk apportionment constitute the procurement systems in construction.

Collectively these procurement systems form one of the fundamental institutions of the construction industry.

Morishima (1984) describes economic institutions in broad terms as those formal and informal rules, organisations and types and sources of information which in combination lead to an understanding of how different markets operate. Each market has its own set of institutions which tend to be understood to a greater or lesser extent by those individuals or firms which supply or purchase any particular product or service.

Morishima's approach to understanding how markets operate extends to the organisations which supply information to the market. The market cannot operate without information: buyers need to know about potential sellers and, more pertinent here, sellers need to find out about opportunities to sell their goods and services to potential customers. Among the many firms and consultancies who provide market information to firms in the construction industry, two private sector sources of information which provide procurement data are Davis Langdon and Everest (DLE) and Emap Glenigan (EG).

An example of Morishima's approach is given by procurement systems in the construction industry. Methods of building procurement represent the negotiated interface between contractors and their clients. They summarise their economic, financial, and legal obligations and relationships. In considering the relationship between the participants in the construction process, the choice of procurement

system reflects the distribution of control and risk between client and contractor. The procurement system selected determines the control and power the various parties may exercise and the risks to which they are exposed. In this way contracts enable building production to take place. They are necessary, unavoidable and either explicit or implicit in all building work from the very smallest of domestic repairs to the largest building projects. Because of the economies resulting from transacting within an established set of institutions, the vast majority of contractual relationships conform to those implied by the small number of prevalent procurement systems. This is vital market and marketing information.

Developers and their advisors need to know what types of prevailing procurement methods are currently being used and which ones are predominant in the market. Procurement methods are the way the construction industry and its clients do business. Although the client in principle selects the procurement method, it is important to choose one which is readily understood by all parties and reflects the current state of the market.

LITERATURE REVIEW

From the literature, such as Franks and Harlow (1998), it would appear that though there are many diverse possible methods of obtaining building work, in practice only a relatively few methods of procurement are used. Since 1984 DLE have conducted a survey latterly on a triennial basis of quantity surveyors concerning the types of procurement systems adopted on a large sample of projects. This has been the only

regular source of published data on the use of procurement systems and has therefore gone largely unchallenged, though Masterman (1992) relies on RICS surveys and on NEDO studies for the 1980s.

Although Goh (1999) demonstrates a predictive model of construction demand can be derived from a number of macro-economic variables, both Cannon (1994) and Fleming (1986) have commented on the shortcomings of official data concerning the construction industry. Their comments imply there is a continuing need to find further sources of data on the construction industry to compare to or use alongside the official statistics. Although Goh uses macro-economic variables to predict construction demand, a more detailed analysis of construction is required to understand the reaction of firms in the construction industry to changes in demand. One such detail within the construction industry is provided by examining a long established private sector survey and a new source of data concerning the use of contracts. This represents an opportunity to view an aspect of the construction industry not currently covered by the data provided by the DTI.

DAVIS LANGDON AND EVEREST DATA

Davis Langdon and Everest (2003) produced their latest triennial report on the use of different procurement systems in 2001. The accuracy of the 2001 data, which DLE analysed, is limited because although as many as 2,955 projects were included in the survey, it was based on a randomly selected sample of those quantity surveying (QS) practices and local authorities, which employed chartered quantity surveyor members

of the RICS. It certainly shows what a sample of QS practices reported, but there is no way of ascertaining the degree to which the results of the survey are representative of the whole industry. The DLE report does not indicate the response rate of the QS practices and nor does it take into account those projects where no RICS member was employed. However, the report states that in 2001, the number of surveys returned was 230, covering projects with a total value of £3,337m which represented 13.6 per cent of the aggregate value of new orders in that year.

Black and Eldredge (2002) refer to this type of non-random sampling as convenience sampling and warn that the use of inferential statistics to analyse such data is not desirable. That does not mean that it is always avoidable. The DLE survey covered 21% of the value of new orders in 1998 and only 14% in 2001. The average value of projects in the DLE survey is invariably over £1m at 2001 prices. In 1998 it was as high as £2.38m. According to the DLE report, in 2001 between 600 and 700 projects were up to £50,000 in value and between 200 and 300 projects were valued between £1m and £2m. Seven projects were over £50m in value. The results of the DLE survey may therefore only be indicative of trends in the building industry.

This paper also makes use of EG data on contract types and values collected by EG in the course of their work in finding business leads for construction firms throughout the UK. This involves a continuous process of data collection based on planning applications. The result is a database of *all* projects over approximately £100,000 in the UK since 1993, for which planning permission was sought. Projects under £100,000 were excluded from this comparison. It does not follow that all

applications were necessarily successful. The total value of EG planning application over £100,000 is similar in size to the aggregate value of orders given in *Annual Construction Statistics* published by the DTI. Through research collaboration with EG, it is now possible to verify the accuracy of DLE's existing data for the first time by using a new source, namely the EG data and conversely to use the DLE data to validate the EG findings.

The authors of the DLE survey stated their belief that although the 2001 survey only captured 13.6 per cent of new construction orders placed (excluding infrastructure), "it should still provide a sound representation of contracts in use in the industry as a whole" (DLE 2003: 9). Unfortunately no justification is given for this belief. This is not to say that the data is any more or less limited than any other data set.

Although changes in the usage of systems are described in the DLE report, no reasons are given for these changes. In their 2001 report DLE noted that one of the most significant changes between 1995 and 1998 was the increased use of contracts adopting design and build as a procurement method. Design and build (DB) contracts accounted for 11.8% by number of all contracts in 1995. In 1998 this figure had risen to 20.7%. However in the 2003 report, the share of DB contracts had fallen to less than 14% of all contracts used. In terms of the proportion of total value the share accounted for by DB contracts had risen from 30.1% in 1995 to 41.4% in 1998 and remained at 42.7% in 2001.

The rise and fall of DB contracts between 1995 and 2001 may have reflected the relative power of clients over contractors following the construction recession of the early 1990s. As contractors' confidence returned with the continuing demand for work towards the end of the century, contractors were in a stronger position to resist the additional burden of responsibility for design.

EMAP GLENIGAN DATA

Unlike the DLE data, the EG data is based not on a sample, but on the whole population of projects identified by EG. However, like any set of data EG data also has its limitations. For example, EG data classifies information by procurement types and contract types but both contain a category called "Developer/Builder" which does not appear as either in the literature on the subject. The term developer/builder presumably corresponds to the term "speculative builder" where the builder also undertakes the role of the client or developer. EG rely on and report the information given to them by the individuals concerned with projects identified as early as the pre-planning stage. The development stages used by EG are pre-planning, planning, pre-tender, tenders invited and the contract awarded stages. Projects are tracked by EG staff to provide contractors with up to date information and contact leads as the planning process develops. Using this method of data gathering may be no more or less effective than other sources used by the Department of Trade and Industry (DTI) and DLE.

The data used by EG is based on data supplied by local authorities and supplemented by information from developers, contractors, surveyors and architects. The data used by DLE is based only on quantity surveyors. Consequently, there are differences in the terminology used in the two surveys to describe procurement systems. Although the terms may overlap, the same term may be used to define different things in the two data sets making the comparison indicative rather than definitive. For example, EG uses *Design and Build* and *Design and Construct* as separate categories, whereas DLE refers only to *lump sum contracts with design and build*.

Tables 1 to 3 show the categories of procurement systems found in both enquiries, assuming that the definitions of design and build, construction management and management contracting used are the same in both sets of data and relate to the terms used in Franks and Harlow (1998). On this basis a comparison of EG data with the DLE data can be carried out using procurement data taken from 1993, 1995, 1998 and 2001.

HYPOTHESES AND METHODOLOGY

The use of contracts reflects changes in market conditions, roles and relationships within the construction industry. Information about what contracts are currently in use lets participants know the best way of proceeding in an ever-changing market by giving an idea of what is happening in the market. It allows advisors to recommend procurement methods on the basis of trends in their use though such behaviour would tend to reinforce existing trends. This would however utilise the collective wisdom

and experience of the industry to improve the performance, productivity and efficiency of individual firms and hence the average of the whole industry.

Taking Tables 1 and 2 together the 1993 EG and DLE data provide evidence of the predominance of traditional or lump sum contracting and design and build both in terms of the number of contracts and their aggregate value. All the other procurement methods in total constitute less than 5% of work by number and only about 10% by value. Several of the categories used in the EG data are statistically insignificant.

It is clear from the 1993 data that of the 14 different contract types listed by EG, traditional and design and build contracts dominated the field of procurement methods to such an extent that changes in the usage of other types of procurement contracts were only likely to affect the overall picture at the margins. The other categories were seldom used. They were Construction Management, design competition (which is not a procurement contract but a method of selection), developer-builder (which in this context is a form of procurement, where the client is also the main contractor), lane rental-competitive tender (which is a specific form of arrangement used in road construction and therefore not an option open to other types of construction projects), measured term and turnkey. The other categories currently in use such as the Private Finance Initiative (PFI) had not been introduced by 1993.

The EG data nevertheless refers to arrangements between parties to the production process in its widest sense. In contrast the terminology used by DLE, based (as their survey is) on the quantity surveying profession, concentrates on systems of

measurement and payment, namely: lump sum–firm Bill of Quantities (BQ), lump sum–specifications and drawings, remeasurement–approximate BQ, prime cost plus fixed fee. Only their construction management, design and build, and management categories consider the wider management context. If the lump sum contracts are assumed to be equivalent to the traditional contracts referred to in the EG data then it becomes possible to compare both sets of data. The question that then arises is whether there are any statistically significant differences. To answer this question two hypotheses are tested.

The published DLE data and the EG data can be compared. The null hypothesis is that there is no significant difference between the use of different procurement systems in the two sets of data. More specifically, the first null hypothesis is: there is no significant difference between the DLE and the EG percentage distributions of procurement types by number of projects.

The second null hypothesis is: there is no significant difference between the DLE and the EG percentage distributions of procurement types by value of projects.

Using the methodology described by Black (1994: 729) to compare contract types, we test for differences in the share of number of contracts and the value of work done using corresponding contract types between the EG and DLE data sets. We use the chi square goodness-of-fit test to compare frequencies in the two data sets. The test is:

$$\chi^2 = \Sigma[(f_o - f_e)^2/f_e]$$

$$df = k - 1 - c$$

where f_o = frequency of observed values (EG data)

f_e = frequency of expected values (DLE data)

k = number of categories

c = number of parameters being estimated from the sample data

df = degrees of freedom

However because no parameters are being estimated from the data, $df = k - 1$. The χ^2 test compares the frequency of each type of procurement in the EG data to the frequency of its corresponding type in the DLE data. The χ^2 test used gives the 95 per cent confidence level of significance which implies that the difference in frequencies between the two sets of data is only significant if it would normally occur only once in every twenty similar trials.

The χ^2 test was used to compare differences in the EG data with the DLE data on the percentage of contracts and the percentage value of contracts for each year, with 95% confidence limits and up to 5 degrees of freedom (df). In carrying out the χ^2 tests only comparable cells were used in Tables 6 and 7.

DESCRIPTION OF THE DATA

Tables 1 and 2 show the classification of procurement types in the EG and DLE data. Table 1 compares the *percentage of projects* using different procurement systems and Table 2 the *share of the value of work done* using different procurement systems.

Table 1 Emap Glenigan and Davis Langdon and Everest data showing the percentage distribution of contract types by number.

Type of contract	Emap Glenigan				Davis Langdon and Everest			
	1993	1995	1998	2001	1993	1995	1998	2001
Construction management	0.0	0.2	0.5	1.1	0.4	1.3	0.8	0.4
Design and build	17.6	14.5	13.3	19.9	16.0	11.8	20.7	13.9
Design and construct	0.3	0.3	0.5	0.3				
Framework agreement			0.0	0.6				
Lane rental-competitive tender		0.3						
Management	1.2	1.4	1.6	0.9	0.9	1.2	1.5	0.6
Measured term	0.0	0.0	0.3	0.8				
Partnering agreement			0.2	1.4	-	-	-	0.6
PFI		0.0	0.4	1.9				
Schedule of rates		0.5	0.4	0.2				
Traditional	80.7	82.6	82.6	72.7				
Turnkey		0.2	0.1	0.4				
Lump sum – firm BQ					34.5	39.2	30.8	19.6
Lump sum – Spec and drawings					45.6	43.7	43.9	62.9
Remeasurement – approximate BQ					2.3	2.1	1.9	1.7
Prime cost plus fixed fee					0.3	0.7	0.3	0.2
Total	99.8	100	99.9	100.2	100	100	99.9	99.9
Number of projects ¹	17,915	18,139	17,265	12,590				
Number of observations ¹	11,009	11,072	12,753	6,506	3,786	4,652	2,457	2,955

Notes:

¹ Differences in total projects and observations in the EG data due to removal of “Unknown” and “Developer/builder” contract types from the population. (“Design competition” and “land sale” were also removed).

In the EG contract types for 2001, “build own and operate” and “self build” are included in “turnkey” and “prime contract” is included in “partnering and framework agreements”.

DLE percentages adjusted by DLE to exclude “other contracts”.

Figures do not always round to 100.

Table 2 Emap Glenigan and Davis Langdon and Everest data showing the percentage distribution of contract types by value.

Type of contract	Emap Glenigan				Davis Langdon and Everest			
	1993	1995	1998	2001	1993	1995	1998	2001
Construction management	1.5	1.9	1.0	2.9	3.9	4.2	7.7	9.6
Design and build	26.8	21.2	18.8	25.0	35.7	30.1	41.4	42.7
Design and construct	1.7	1.0	0.7	0.9				
Framework agreement			0.0	4.2				
Lane rental-competitive tender		0.2						
Management	8.4	9.1	4.7	4.2	6.2	6.9	10.4	2.3
Measured term	0.1	0.0	0.3	0.7				
Partnering agreement			0.5	5.3	-	-	-	1.7
PFI		0.3	7.4	7.2				
Schedule of rates		1.1	1.0	0.2				
Traditional	60.5	62.2	62.7	48.2				
Turnkey	0.9	3.0	2.8	1.0				
Lump sum – firm BQ					41.6	43.7	28.4	20.3
Lump sum – Spec and drawings					8.3	12.2	10.0	20.2
Remeasurement – approximate BQ					4.1	2.4	1.7	2.8
Prime cost plus fixed fee					0.2	0.5	0.3	0.3
Total	99.9	100	99.8	100	100	100	99.9	100
Total value of projects £m ¹	24,518	36,283	39,150	44,799				
Total value of observations £m ¹	17,275	22,477	29,412	24,849	2,819	3,224	4,767	3,337

Notes:

¹ Differences in total value of projects and observations in the EG data due to removal of “Unknown” and “Developer/builder” contract types from the population. (“Design competition” and “land sale” were also removed).

In the EG contract types for 2001, “build own and operate” and “self build” are included in “turnkey” and “prime contract” is included in “partnering and framework agreements”.

Figures do not always round to 100.

DLE percentages adjusted by DLE to exclude “other contracts”.

The Tables show the extent to which the two sets of data capture different information using different but overlapping terminologies. For example, whereas the EG data refers to traditional contracts, the DLE data uses the term “lump sum” in conjunction with firm or approximate bills of quantities. Both EG and DLE use the terms construction management and design and build. EG include PFI as a category in 1995, 1998 and 2001 although PFI is not a recognised “procurement” route as such and is not used by DLE in their survey. PFI is an undertaking by a private sector firm or consortium in the form of a special purpose vehicle (SPV) to design, build and operate a building (or service) to a client in the public sector. It is the SPV which

places a contract with a builder, often using a design and build contract. This may then be recorded as a design and build contract in the DLE data. As the EG data commences with the pre-planning stage it is likely that PFI is used as a contract type by the public sector client and is therefore recorded as a PFI project in the EG data.

An adjustment to the raw data was necessary because EG changed their reporting methods between 1995 and 2001. The original data contains two variables called “procurement types” and “contract types”. In 1995 of the 3,475 projects with a “builder/developer” procurement type, the contract type was reported as unknown in all but 16 projects. In 2001 of the 3,996 builder/developer procurement type projects the contract type of all but 22 projects was given as builder/developer. As builder/developer is a form of speculative developer it does not have an equivalent category in the DLE data. It has therefore been excluded from the comparison along with those cases where procurement type was given as unknown. An adjustment was made to the EG data for 2001 excluding 3,974 builder/developer (contract type) projects in this classification and a further 2110 projects, where the procurement type was given as “design competition” or “land sale”. These anomalies in the EG data arise because their researchers report what they are told by their project contacts.

In the DLE data, procurement methods are grouped as 8 different types of contract, namely; lump sum contracts with firm Bill of Quantities (BQ), specification and drawings contracts, design and build, remeasurement with approximate BQ, prime cost plus fixed fee, management contracts, construction management and partnering agreements.

Table 3 Simplified version of tables 1 and 2 showing the different procurement contract terminology used by Emap Glenigan and Davis Langdon and Everest.

Emap Glenigan	Davis Langdon and Everest	This paper
Construction management	Construction management	CM
Design & build and Design & construct	Lump sum – Design and build	D & B
Framework and partnering agreements	Partnering agreements	P
Management	Management contract and prime cost + fixed fee	M
Schedule of rates and measured term	Remeasurement – approximate BQ	SoR
Traditional	Lump sum – firm BQ or Spec and drawings	Trad

In Table 3 we have simplified the 16 overlapping terms used in Tables 1 and 2 into 6 categories as follows:

Design and build and design and construct combined are equivalent to lump sum-design and build. All are combined in our category ‘D and B’.

Framework agreement is equivalent to partnering agreement combined. Both are combined in our category ‘P’.

Measured term, lane rental-competitive tender and schedule of rates combined are equivalent to remeasurement-approximate BQ. All are combined in our category ‘SoR’.

Management contract is equivalent to prime cost plus fixed fee. Both are combined in our category ‘M’.

Lump sum firm BQ and specification and drawings combined are equivalent to traditional. All are combined in our category ‘Trad’.

Both data sources use the category Construction Management. This is reflected in our category 'CM'.

PFI and turnkey projects are not construction procurement contracts strictly speaking.

In itself PFI does not determine the relationships between the participants in the building process. Because PFI is only concerned with arrangements between the client and the service-provider (a PFI contractor) PFI projects are excluded from Tables 4 and 5. Design competition is not a recognised procurement contract and is also removed from Tables 4 and 5. The percentages given represent the percentages of the remaining contracts.

Using the simplification of the data in Table 3 produces the results in Tables 4 and 5.

Table 4 Emap Glenigan and Davis Langdon and Everest data showing the percentage of projects by contract type in 1993, 1995, 1998 and 2001.

Procurement method	Emap Glenigan				Davis Langdon and Everest			
	1993	1995	1998	2001	1993	1995	1998	2001
CM	0.0	0.2	0.5	1.1	0.4	1.3	0.8	0.4
D &B	18.0	14.9	13.9	20.8	16	11.8	20.7	13.9
P	0.0	0.0	0.2	2.0	-	-	-	0.6
M	1.2	1.4	1.6	0.9	1.2	1.9	1.8	0.8
SoR	0.0	0.5	0.7	0.2	2.3	2.1	1.9	1.7
Trad	80.8	83.1	83.1	74.9	80.1	82.9	74.7	82.5
Total	100	100	100	100	100	100	99.9	99.9

Table 5 Emap Glenigan and Davis Langdon and Everest data showing the percentage of value by contract type in 1993, 1995, 1998 and 2001.

Procurement method	Emap Glenigan				Davis Langdon and Everest			
	1993	1995	1998	2001	1993	1995	1998	2001
CM	1.5	2.0	1.2	3.1	3.9	4.2	7.7	9.6
D &B	28.8	23.0	21.7	28.3	35.7	30.1	41.4	42.7

P	0.0	0.0	0.5	10.3	-	-	-	1.7
M	8.5	9.4	5.3	4.6	6.4	7.4	10.7	2.6
SoR	0.1	1.2	1.5	1.1	4.1	2.4	1.7	2.8
Trad	61.1	64.4	69.9	52.6	49.9	55.9	38.4	40.5
Total	100	100	100	100	100	100	99.9	99.9

ANALYSIS OF DATA

In all the years, which are compared in this study, traditional contracts continued to predominate in terms of the numbers of contracts in both EG and DLE. However, in Table 5 both DLE and EG show the value share of DB first falling between 1993 and 1995 and then rising. However, the reported rise in the DLE data starts earlier and is greater relative to the fall than in the EG data. The DLE and EG data on the percentage of contracts used by number of projects were not significantly different at the 95% confidence level in any of the years compared in Table 6. The EG data therefore confirms the findings of the DLE reports concerning the percentage use of contracts.

Table 6 Comparison of the percentages of number of projects by contract type

	1993	1995	1998	2001
observed χ^2 value	0.1812	3.0963	4.0710	9.9530
critical value at 95% conf.	5.9915	9.4877	9.4877	11.0705
df	2	4	4	5

Table 7 Comparison of the percentages of value by contract types

	1993	1995	1998	2001
observed χ^2 value	9.9159	5.2602	43.799	58.949
critical value at 95% conf.	9.4878	9.4877	9.4877	11.0705
df	4	4	4	5

However, differences in the share of total value of each type of contract in the two sets of data were significant in 1993, 1998 and 2001. These results confirm that the EG and DLE data increasingly show differences in the shares of contract values surveyed.

Tables 4 and 5 show that by 2001 partnering or framework agreements were 2 per cent of all projects according to EG and 0.6 per cent according to DLE. This form of collaboration represented only 0.2 per cent of the EG distribution in 1998 and only appeared for the first time in the 2001 DLE data. Yet by 2001 partnering agreements were over 10 per cent of the value of all projects recorded in the EG data, being the third largest category of procurement method. In the DLE data partnering only represented less than 2 per cent of the value of all projects. Nevertheless, the trend in partnering shown in the EG survey reflects the changing pattern of procurement towards partnering arrangements and the growth in PFI. The growth in the share of partnering arrangements (given in the EG data of Table 2) from 0.5 per cent of all contracts in 1998 to 5.3 per cent in 2001 may be indicative of the influence of the Egan Report and changes towards more co-operative methods of working which are often reported anecdotally by those in the construction industry. The much smaller figures for partnering agreements given in the DLE data for 2001 may reflect the stricter definition of partnering as a procurement method and contract adopted by the quantity surveying and legal professions respectively.

DISCUSSION

There are several possibilities to account for differences in the shares of the total value of construction output covered by the surveys. There are differences in the data sources used by EG and DLE. For example, whereas the 2001 DLE data is based on 230 returns from professional quantity surveying practices working on 2955 projects of which only seven were valued at over £50m, the EG data covered just under 6600 projects. Because of the greater number of projects the authors would therefore tend towards the view that the EG data is preferable as an indicator of contract usage in the construction industry in the absence of further information.

Another reason for the differences in the value of contract shares of construction output between the 2 data sets is that the DLE and EG surveys do not measure the same things. As work on existing building does not always require planning consent the DLE data may include repair and maintenance work, which is omitted from the EG data and hence account for differences in the share of value undertaken using the different procurement methods. In other words the differences between the DLE value data and the EG value data (Table 5) may show that, for example, in 2001 while the value of DB contracts were only 28.3% of all new build work according to EG, they comprised, according to DLE, 42.7% of the value of all new build and repair and maintenance, where professional quantity surveyors were employed. We do not know if the relatively high value of DB contracts in the DLE data is due to the use of DB contracts in repair and maintenance work or due to the advice of surveyors. As the proportion of the use of DB contracts by number is similar in both surveys, it may

be that surveyors are tending to advise their clients to use DB contracts. By 2001 DB contracts were therefore used less frequently than in 1998 but were still preferred on larger projects especially those procured with the help of professional surveyors. This mode of operation is also acceptable to larger contractors who could work with architects in much the same way as they did with other specialist contractors. In contrast, on smaller projects smaller contractors may be relatively weak in their negotiations with designers and therefore reluctant to take on DB contracts especially if alternative work was available.

It appears that the DLE data captures some aspects and the EG data others. As EG rely on the planning process, they do not appear to be picking up on repair and maintenance. What procedures do EG have for collecting data on work on existing stock? The DLE sample appears to pick up on the use of remeasurement and approximate bills of quantity used predominantly in repair, maintenance and improvement (RMI) without involving planning permission. Similarly the DLE data appears to record a higher proportion of projects using schedules of rates compared to EG.

There is another methodological problem here. The question arises, is it better to use a sample or a population census? The DLE data is biased as only a proportion of quantity surveyors who were approached responded to the survey and selected projects of their choosing. Neither the surveyors nor their projects were randomly selected. On the other hand, although the EG data represents a population survey, a large proportion of the data is missing. The missing data may be systematically

biasing the results. All that can be said is that the authors of this paper did not interfere with the data that was provided. However, this only passes responsibility for bias in the results down the line to the data gatherers, who in this case are a private sector provider of marketing information for firms in the construction industry. The raw data may have been perfectly suited to the marketing purpose for which it was collected without it being useful for statistical analysis purposes.

Further research is needed to study the relationship between stratified samples of the EG data with data from other sources such as the Department of Trade and Industry (2002) 'orders' data from their project based enquiry in order to make best use of the EG data. In any case, the DLE data was not randomly drawn from the population. Therefore one would expect statistically significant differences on any variable used in the comparison.

What remains is that both the DLE and EG data purport to indicate various levels and trends in contract use in the construction industry in a number of years by implication and inference. It is therefore necessary to choose which data set is the more representative. As the DLE data is based on less than half the number of projects in the EG data, the DLE is more limited in scope.

One of the findings to emerge from this comparison of the EG and DLE data confirms Franks and Harlow referred to above. A very high proportion of the data appears to consist of traditional and design and build, with all other forms of procurement comprising less than 20 per cent of contracts. The share of the total

value of work of procurement methods other than traditional and design and build is also less than 20 per cent. It would therefore be useful if the EG data adopted a similar breakdown of procurement types as that adopted by DLE to analyse traditional and design and build contracts. This would enable a more meaningful analysis of procurement methods leading to a greater understanding of any changes taking place in the roles and relationships of participants in the building process.

CONCLUSION

Both EG and DLE data sets show that in terms of the number of contracts traditional procurement methods continued to predominate followed by design and build. The other procurement types are not used as frequently by any means. However, in terms of the value or volume of work carried out using the different procurement routes a slightly different picture emerges. The predominance of traditional contracts by their aggregate value is not as great as the number of times they are used. Indeed the DLE data shows that in 2001, for example, the value of work carried out using design and build contracts was 43 per cent of the total value of work carried out compared to 41 per cent using traditional contracting methods. This was not the case in the EG data. In 2001 in the EG data the figures were 28 per cent and 53 per cent respectively.

The EG and DLE data sets showing the simple frequency of use of different contract types are broadly comparable. Both, therefore, appear to be similarly representative of the use of contract types and can be used to answer different questions.

However, the Tables given in this paper show significant differences in the value of work done using the different contract types. As changes took place in the composition and nature of construction work, the data captured by the two sets of data differed significantly in 1993, 1998 and 2001. These differences between the two data sets may be partly due to the fact that EG is based on local authority planning applications information and did not capture repair and maintenance work to the same extent as DLE. The EG data set probably better reflects the value shares of the different contract types in 'all new construction', whereas the DLE set probably better reflects value shares in 'all construction, including repair and maintenance'.

Finally, if progress is to be made in understanding the market for construction work, clearer definitions are needed in the descriptions used for the main variables. It is interesting that EG's data is collected for potential contractors and suppliers, because the majority of EG's customers are people for whom the procurement method is not particularly important. For example, a supplier of cladding is only interested in supplying cladding for a particular building, regardless of how the main contract is procured. But to make sense of the market for main contractors, and the kinds of risk to which they are routinely exposed, the main relationships in the procurement system must be more clearly defined. These relationships are to be found by examining particular aspects of the procurement system, namely:

funding

procurement

contractor selection, and

contract form.

We propose that these processes are kept clearly separate by asking specific questions relating to each of these things when collecting data on methods of procurement.

REFERENCES

Department of Trade and Industry (2002) *Annual Construction Statistics*, London: DTI.

Black, K. (1994) *Business statistics*, St Paul, Minnesota: West Publishing Company.

Black, K. and Eldredge, D. (2002) *Business and economic statistics using Microsoft Excel*, Cincinnati: South-Western.

Cannon, J. (1994) Lies and construction statistics. *Construction Management and Economics*, 12, (4), 307-313.

Davis Langdon and Everest (2003) *Contracts in use: a survey of contracts in use during 2001*, London: DLE.

Egan, J., (1998) *Rethinking Construction*, London: DETR

Fleming, M.C. (1986) *Spons Guide to Housing, Construction Property and Market Statistics*, London: E & FN Spon.

Franks, J. and Harlow, P. (1998) *Building procurement systems: a client's guide*, 3rd ed., Harlow: Longman.

Goh, BH., (1999) *Construction demand modelling: a systematic approach to using economic indicators*, London, The Royal Institution of Chartered Surveyors Research Papers, Vol 3 No 4.

Masterman, J.W.E. (1992) *An introduction to building procurement systems*, London: E & FN Spon.

Morishima, M. (1984) *The Economics of industrial society*, Cambridge: Cambridge University Press.