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Subcontracting in commercial and residential construction: an empirical investigation

NICOLA COSTANTINO[1], ROBERTO PIETROFORTE[2*] and PETER HAMILL[3]

[1] *Dipartimento di Progettazione e Produzione Industriale, Politecnico di Bari, Bari, Italy*

[2] *Department of Civil and Environmental Engineering, Worcester Polytechnic Institute, 100 Institute Road, Worcester, MA 01609-2280, USA*

[3] *Turner Construction, Boston, USA*

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Some twenty years ago Robert Eccles argued for the theoretical existence of the quasifirm, a semi-integrated form of production in the construction industry, following a field study of home building firms in the USA. The study was aimed at substantiating some aspects of Williamson's transaction cost theory. The present work has similar intents, and illustrates the results of two recent field studies of homebuilders and commercial contractors, and the specific features of their subcontracting practice. Given the difficulty of an effective measurement of transaction costs in construction, Williamson's concept of atmosphere is suggested to explain the different approaches observed in subcontracting.

Keywords: Quasifirm, transaction costs, subcontracting, construction market, homebuilders, general contractors

Introduction

Similarly to other goods production sectors, the activities of the construction industry can be interpreted as a network of transactions, or contracts in the wide sense of that term. These transactions pose the challenge of choosing the right governance structure for their implementation. Building upon the work of Coase (1937), Williamson developed a theoretical framework for answering such a challenge (1975, 1979). According to the framework, the analysis of transaction costs (those incurred when seeking and gathering information about buyers and sellers, writing and negotiating contractual agreements and administering their execution) explains why the exchange of goods and services is governed by a specific government structure, ranging from full internalization or hierarchy to full externalization or market. The framework proposes several factors or drivers of a particular governance that ultimately are referable to the availability of information between transacting parties and the costs to these parties of adding to that information, should they require more or achieve what the economists call information parity. The transaction paradigm of Williamson has received considerable attention by academics and has been applied to a variety of construction related topics, such as alternative structures of work organization (quasifirm: Eccles, 1981a, b; macrofirm: Dioguardi, 1983, 1996), the organization of the construction process and subcontracting (Gunnarson and Levitt, 1982; Winch, 1989; Costantino, 1994; Pietroforte, 1997; Smyth, 1999), corporate decision making (Bon, 1991) and impacts of contractor selection (Lingard *et al.*, 1998). With the exception of Eccles's (1981b) study, the common denominator of these studies is the lack of empirical work that substantiates the various dimensions of the transaction paradigm, particularly the factors that

*Author for correspondence. e-mail: roberto@wpi.edu

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determine the choice between hierarchy and market mechanisms. This problem is not limited to the construction industry. Lack of empirical data was outlined by Coase himself in his 1991 Nobel lecture (Coase, 1993) where he recognized the need for 'a great deal of more empirical work' to substantiate his theory, considering also 'the extremely complex interrelationships that govern the mix of market and hierarchy'. Consequently, any, albeit fascinating, theory remains a hypothesis if what is expected from the theory in terms of explanation of phenomena is not verified empirically and if the results of this verification are not duplicated.

This paper is concerned with empirical work aimed at substantiating some aspects of Williamson's theory, through an investigation of subcontracting practice in US building construction. The study is based on two recent field studies of homebuilders and commercial (non-residential) contractors that follow the analytical methodology of Eccles's investigation of homebuilders' subcontracting practice (Eccles, 1981b). Eccles's study used empirical data about some of the critical dimensions that describe Williamson's governance structure for commercial transactions to argue the theoretical existence of the 'quasifirm', a stable organizational unit between homebuilder and speciality subcontractors, when conditions permit. These dimensions refer to the frequency of transactions between contractor and subcontractors, their stability over time, the use of labour-only subcontracting, and selection criteria for subcontractors, and were used by the authors for gathering the data for their field studies. Before illustrating the authors' findings in commercial construction subcontracting, there is a review of Eccles's study of homebuilders, including a verification of its results. The paper concludes with a discussion of the limitations of the studies presented, and recommendations for further empirical verification of Williamson's theory.

Subcontracting by homebuilders

Among the various sectors of the US building construction industry, homebuilding has the lowest rate of outsourcing, approximately 65% (as a ratio of subcontracting payments and cost of materials and components, and value of construction work). This rate has slightly decreased in the last 20 years, from 67 % in 1977 to 64% in 1997, according to census data (US Bureau of Census, 1981, 2000). Eccles's survey took into consideration a sample of 26 US homebuilders whose operations were geographically limited to Eastern Massachusetts (Eccles, 1981b), in practice within a 1-hour drive from their home bases. It is not known whether the sample included speculative builders. Most of the firms were engaged in the construction of single-family homes with an average start of 22 units in 1978. At that time the typical firm had been in business for 23 years and was facing a severe housing market depression in the state. The study argued that subcontracting develops a set of stable relationships between the general contractor and special trade subcontractors, called quasifirms, that is in some way intermediate to market and hierarchy. On a project basis this relationship takes the form of classical contracting, but as parties cooperate over the years the same relationship takes the form of relational contracting (employment relation). The evidence for the quasifirm was found in the above-mentioned four dimensions of homebuilders' business relations. Table 1 shows the number of subcontractors used in each trade, length of general contractor–subcontractor relationships and extent of use of labour-only subcontractors. The trades of homebuilding have been grouped according to a breakdown that differs from the original study. Table 2 contains the data about the procedures that are used by general contractors for selecting subcontractors. Tables 1 and 2 contain also the data of the commercial construction's survey.

The following is a brief review of the four critical dimensions. (a) The low number of subcontractors generally considered for performing each trade of a house project. The survey shows an average number of 2.1 subcontractors for each category of house building work. This index is almost the same in all trades, from a minimum of 1.7 for tile installation to a maximum of 2.8 for rough carpentry. (b) The long-term or stable business relationship between homebuilder and subcontractors. According to the survey, the average length of the longest relationship was 9.2 years. (c) The frequent use of labour-only subcontracting by homebuilders. The frequency of 41.1% of this type of subcontracting suggests a kind of employment relationship between the homebuilder, who supplies materials, plant and machinery, and independent subcontractors. According to Eccles this approach was fostered by the very small size of typical subcontracting firms (approximately 60% had no employees), as shown in the 1977 census data (US Bureau of Census, 1981). This type of subcontracting creates many coordination interfaces between supply and installation activities. The solution of these challenges entails more management coordination efforts and cooperative spirit, i.e. an established good working relation between homebuilder and labour-only subcontractors. (d) The procedures used for selecting subcontractors for a project, namely the low frequency of formal competitive bidding. The survey shows that formal competitive bidding, a form of market

Table 1 Number of subcontractors used in each trade, length of business relationship and use of labour-only subcontracting

Eccles's survey	Average number of sub-contractors	Average length of longest sub-contractor	Use of labour only sub-contractors[a]	Commercial construction survey	Average number of sub-contractors	Average length of longest sub-contractor relation-ship in years	Average length of sub-contractor relation-ship in years
Foundations	2.0	9.9	76.0	Foundations	8.0	25.5	10.1
Rough carpentry	2.8	7.7	94.1	Structure	9.4	19.9	8.8
Insulation and caulking	1.9	9.6	4.0	Roofing and waterproofing	8.7	18.4	9.2
Roofing	2.6	6.2	89.5				
Masonry	2.0	9.5	29.2	Exterior wall	8.9	19.3	10.3
Siding	2.9	6.5	94.4				
Drywall	2.2	7.6	23.1	Interior finishes and partitions	15.1	24.6	9.9
Finish carpentry	2.4	5.3	83.3				
Flooring	1.9	8.4	60.0				
Painting	2.1	10.7	27.3				
Plaster	1.9	10.2	0.0				
Tiles	1.7	9.5	38.5				
Heating and cooling	1.9	11.1	4.0	Mechanical	12.2	21.9	10.8
Plumbing	1.9	11.1	3.9				
Electrical	1.8	11.8	7.7	Electrical	10.8	23.0	10.8
Landscaping/rough grading	1.8	11.5	38.5	Sitework	8.4	20.9	8.8
Finish landscaping	2.0	6.7	43.8				
				Specialities and equipment	13.5	17.0	7.5
				Vertical transportation	7.3	20.8	9.6
Average	2.1	9.2	41.1	Average	10.2	21.1	9.6

[a]As a percent of builders who subcontract this trade 75–100% of the time

Table 2 General contractors' procedures for selecting subcontractors

Eccles's survey		Commercial construction survey	GC has a negotiated contract with owner	GC has a non-negotiated contract with owner
Competitive bidding	19.60%	Lowest bidder	4.55%	9.55%
Negotiated selection and price	24.50%	Lowest negotiated price	24.77%	51.59%
Negotiated fixed unit price	23.40%	Best price from a proven sub	60.23%	29.55%
Competitive bidding with discretion in selection	18.50%	Sharing work to maintain business relationship with subs	10.00%	8.86%
Accept the price quoted by subs	14.00%	Other	0.45%	0.45%
		Average number of invited bidders for each category of work		5.99

governance mode, was used only in approximately 20% of the cases, as shown in Table 2. Several forms of price negotiation were used in 60% of the cases, while in 14% of the cases homebuilders accepted the price quoted by subcontractors.

Eccles, in addition, investigated subcontracting practice and the reasons for outsourcing construction trades. Although he found extensive subcontracting, trades such as excavation/grading, rough carpentry, finish-carpentry and siding were self-performed more than 30% of the time. The arrangement is probably driven by the need for controlling the quality and time of construction, and by the fact that in the US home-building industry a typical firm is often the evolution

of a rough carpentry business. As far as the reasons for subcontracting are concerned, the findings show higher ranking for overhead and construction costs reduction and lower ranking for workload volatility and construction time reduction.

The results of a recent survey of 16 homebuilders in central Connecticut (Putnam, 2000) are mostly in agreement with the findings of Eccles and his argument for the quasifirm. 90% of the firms surveyed are involved with the construction of customized single-family homes with an average start of 10 units in 1999, 80% of which are based on negotiated agreements. The typical firm operates in a limited geographic area, within an average 30-minute ride from home base. The completion of the survey coincided with a period of growing construction demand in the USA. The notable differences from Eccles's findings are the decreased rate of labour-only subcontracting (29%) and the relative higher priority given to increased quality and reduced construction time, vis-à-vis overhead and construction cost reduction: respectively, 3.2, 2.7, 2.6, 2.5 on a five-point scale (in terms of strength of agreement) as main reasons for subcontracting. This difference is probably due to the fact that 20% of the surveyed contractors are also speculative builders. Another notable feature of the survey is the lowest ranking (1.9) given to liability concerns among the suggested seven reasons for subcontracting. The ranking is puzzling considering the litigious nature of the US construction industry. The lack of attention to liability exposure probably results from a combination of factors. Speculative builders are both clients and contractors. Contractual liability risks are relatively small considering the small size of the projects. In the sample observed (and in Eccles's study) the substantial rate of self-performed work for the shell of a house increases the control on final performance, and work conditions are less dangerous than those of non-residential construction. These factors decrease homebuilders' concern about liability exposure.

Subcontracting in commercial building construction

The author's field study covers a sample of 23 general contractors, 60% of which are located in Massachusetts and the remaining ones across the USA. These contractors operate in the commercial building construction market and the majority have jobs in more than one state. In 1997 their sales averaged US$ 169 million with an average of 35 on-going projects, 72% of which were based on negotiated agreements. The typical contractor had been in business for 59 years and was experiencing a period of significant construction demand growth at the time of the survey. In the USA, commercial building construction is characterized by a considerable outsourcing rate. Census data show that the rate has slightly increased in the last 20 years, from 74% in 1977 to approximately 76% in 1997 (US Bureau of Census, 1981, 2000). The following notes and Tables 1 and 2 summarize some of the results of the survey. The findings are presented according to the dimensions of contractors' business relations, as per Eccles' s investigation.

Number of subcontractors used in each trade

In the sample examined the average number of subcontractors is 10.2, with a minimum of 7.2 for vertical transportation and a maximum of 15.1 for interior finishes and partitions, as shown in Table 1. This relatively high index suggests that current commercial construction is governed by stronger market subcontracting mechanisms than those prevailing in home building. The value of the index, however, was expected in commercial construction, considering the size of the typical projects, their technical complexity and wider geographic latitude of operations by surveyed contractors. There is also the possibility that the value of the index reflects the generally limited bonding capacity of subcontractors (the capability of growth by acquiring more or larger jobs per unit of time) and, therefore, the fragmented nature of the specialized construction industry. Supply conditions, in addition, affect the purchasing strategy of contractors who, depending on the situation, develop more than one package for the same category of work by balancing the need for increased competition with, at the same time, the need for decreased responsibility and supervision efforts. If the ratio of the average number of projects per year and the average number of subcontractors is considered, the index 3.4 suggests some continuity in the business relationship between contractors and their subcontractors. In a pure market competition (with many sellers), in fact, the value of the very same index would be far less. New empirical data are needed to support these explanations.

Length of general contractor–subcontractor relationships

According to the survey the average length of long relationships is 21.1 years, while the length of a typical business relationship averages 9.6 years. The value of these last 'fidelity' indexes shows that general contractors have business relations with a selected group of subcontractors for a long period of time. This relation transcends the short term nature of pure market transactions, and must have been beneficial for both parties

to continue for so many years. The substantial value of these indexes suggests that business relationships in commercial construction may transcend the anonymity of corporate operations and that personal relationships emerge, as in the case of hierarchically integrated firms. The length of business relations suggests also that the number of subcontractors used in each trade probably reflects more a natural threshold induced by the fragmented nature of the specialized construction industry structure (e.g. the small size of firms), than a set of firms determined by pure market transactions.

Use of labour-only subcontractors

In the sampled commercial construction little if any labour-only subcontracting exists. This result reflects the fact that the surveyed contractors perform minimal work with their own forces, as shown later in this paper. Labour-only subcontracting offers economic advantages to both the contractor and subcontractors. The former avoids the mark-up of full subcontracting and the latter do not incur the initial cost for mobilization (if required) and purchasing materials. This incomplete form of contracting, however, does not allow a clear cut complete transfer of responsibilities. Quality problems and claims may still occur at the interface between the supply and installation of components and materials. This possibility is avoided by contractors by choosing full subcontracting to shift risk and liability, and also to cope with the complexity of construction technology.

Procedures used for selecting subcontractors for a project

The survey reveals that the methods according to which a general contracting firm decides on subcontractors are closely related to the type of agreement it has with the client, as shown in Table 2. When a negotiated agreement is held, over 60% of those surveyed stated that their choice was based on the best price from a qualified and proven subcontractor, while another 25% stated that their choice was based on the lowest price after negotiation. Only a small minority (5%) used competitive bidding with no questions asked.

Predictably, almost the reverse approach was found when a non-negotiated agreement (following competitive bidding) was held between owner and general contractor. Only 30% of surveyed firms stated that their choice was based on the best price from a qualified and proven subcontractor, while in 51% of the cases lowest price after negotiation was used. Surprisingly, only 10% of the firms stated that their choice was based on the lowest bidder with no questions asked. In this regard, some surveyed contractors stated that relying on lowest bids continuously inhibits a sound business approach. In both negotiated and non-negotiated contracts and in 8–10% of the cases, the subcontract award decision was based on dividing the yearly work among subcontractors to maintain business relations. In the commercial construction area surveyed, in conclusion, the organizational choice of production appears to follow a thrust towards recurrent cooperation with a limited number of subcontractors that offer competitive prices. The choice, however, is strongly influenced by the extent of market competition that is experienced by contractors.

Subcontracting practice

Following Eccles's study, the authors' also survey data gathered about the subcontracting practice by general contractors, particularly in regard to the rate of subcontracting, reasons behind this choice and business relationship with subcontractors.

Rate of subcontracting

Predictably, the overwhelming majority of contractors subcontracted all the ten listed categories of work more than 75% of the time. Only 4 surveyed contractors subcontracted work in specific trades less than 75% of the time in 1997, mainly in the areas of site-work and concrete work. In summary, less than 5% of surveyed contractors subcontracted specific categories of work less than 75% of the time.

Contractors were also asked to state what type of work was considered to be self-performed in the current marketplace. The most common answer (65%) was general requirement items (cleaning and safety), followed by finish carpentry (39%) and concrete (35%). Occasionally, some concrete operations (concrete and reinforcement placement) were performed by labour directly hired by general contractors. A follow-up to this question asked what had changed, if anything, from the past to the present in regard to the scope of self-performed work. Surprisingly, most replies indicated that nothing had changed other than a few very specific trades no longer practiced/self-performed, such as drywall work, demolition, site-work, and finishes (e.g. flooring, ceilings and wall treatment). The most common trade by far not practiced in the current marketplace by contractors is masonry activity (44% in the past, 0% in 1997).

Reasons for subcontracting

In the survey 11 different reasons for subcontracting were presented on a five-point scale to respondent contractors. The strongest agreement was found in the

need for reducing liability exposure (4.22) This factor was followed by reduced overhead cost (3.87), reduced overall construction cost (3.78), market volatility (3.48), faster construction time (3.35), reduced equipment/maintenance cost (3.30), value to the owner (3.27) and better workmanship (3.09). The high ranking given to liability concerns reflects the fact that in the last 20 years the US construction industry has witnessed a steady growth of claims and legal actions (Collier, 1996). Building contractors, therefore, have been using subcontracting to shift liability risks, as stated before. The thrust towards shifting liability exposure suggests that general contractors use more 'complete' contracts in subcontracting. This approach implies a diminished need for cooperative relations.

Business relationship with subcontractors

The contractors surveyed were also asked to state the average number of subcontractors invited to bid for a given category of work. As shown in Table 2, the average value of 6 with a minimum of 5.6 (foundations) and maximum of 8 (site work) suggests again that contractors entertain business with a restricted number of subcontractors. The questionnaire even went so far as to ask why more bidders were not asked to bid. Almost half (48%) of those surveyed did not have an answer why more bidders were not asked to bid. The other 52%, on a five-point scale, cited excessive purchasing overhead (4.5), reduction in performance risks (4.42), and the potential of increased supervision of unknown subcontractors (3.67) as three predominant reasons for not increasing the number of competitive bidders. All these reasons are consistent with Williamson's approach to reducing transaction costs. The efficient governance of subcontracting is based more on mutual confidence and understanding, typical of professional services, than on the formal and anonymous relationship between a buyer and a seller of commodities.

The survey finally addressed the issues of whether the management (transaction) costs of subcontracting were specifically measured, and whether this type of information was a factor in subcontracting decisions. Only four contractors addressed these issues fully by stating that no systematic measurement system was in place for tracking this type of costs and that subcontracting decisions were a 'gut feel' issue. Only when a project has been completed can a project manager get a 'feel' for how much specific subcontractors have increased his/her time spent on the job, but always without any quantitative measure. So the explanation of subcontracting in terms of transaction costs is, in some way, a tautological one. Lower transaction costs (expected but not measured in practice) in fact justify subcontracting and, at the same time, the continuous use of subcontracting suggests that the related transaction costs are lower.

Discussion and implications for future research

The results of sampling the homebuilders and commercial contractors suggest that the various sectors that make up the US construction industry differ at least in terms of the business relationships between contractors and subcontractors and the subcontracting rate. These differences do not allow for generalized conclusions for the industry at large, as, on the contrary, past citations of Eccles's quasifirm have shown. The characteristics of the home building sector, in particular, differ considerably from those of other sectors in the US construction industry. A systematic investigation of all main sectors (particularly non-building construction) is needed to develop conclusions of more general application. Ideally, future field studies should be based on larger samples than the limited ones presented by the authors and focus on the reasons for the different subcontracting rates across sectors. The variables of complexity and size of projects, and market extent that were used in a previous study, based on census data, are a good starting point (Eccles, 1981a).

The importance of market extent (e.g. suburban/metropolitan areas) and conditions (e.g. extent of demand) on governance structures is underlined by the findings of the field studies presented. In the homebuilders, the limited geographic area of their operations reduces the range of possible choice/substitution of input resources, and thus contributes to the internalization of production. In the commercial contractors, the larger area of their operations allows for more input choices and substitution, and thus it contributes to the externalization of production, in addition to complexity factors. Similar arguments can be found in Eccles (1981a). Some of the results of the two recent field studies reflect a period of considerable growth of construction demand in the USA. High demand is reflected in the high rate of negotiated agreements with clients. In contractors' terms, certainty of demand affects certainty of output (or price) and the procedures for selecting subcontractors, as shown in the sampled commercial contractors. Extent of market and demand, i.e. level of uncertainty of input resources and output, is consistent with Williamson's discussion on the determinants of bilateral and unified structures, namely the combination of bounded rationality and uncertainty/complexity (Williamson, 1979).

The characteristics of local markets that vary considerably across the USA are another variable to be

considered, in addition to those of market extent and demand. The professional experience of one of the authors shows that a firm may outsource most of the production for a given project in one state and self-perform a significant portion of the same type of project in another state, for competitiveness reasons. This observation suggests that, under particular conditions, local competition and market are a stronger determinant than technological complexity of the governance structure of transactions. Future empirical studies should consider the importance of this issue, particularly at the firm level.

Notwithstanding specific requests for information and data, the contractors surveyed seemed uninterested in measuring their transaction costs for improving efficiency in decision-making. By recognizing the measurement problem, Williamson (1975) proposed a less quantitative but broader way of considering this matter by introducing the concept of 'atmosphere': 'The standard economic model. . .assumes that individuals regard transactions in a strictly neutral, instrumental manner. However, it may be more accurate, and sometimes even essential, to regard the exchange process itself as an object of value. Concern for atmosphere tends to raise such systems issues; supplying a satisfying exchange relation is made part of the economic problem, broadly constructed'. The value of a 'satisfying exchange relation' varies according to the situation of transacting contractors. As stated before, homebuilders operate in a market whose geographically limited size reduces the possible choices/substitutions of specialized labour and supplies. By living and operating in the same area, homebuilders and subcontractors de facto form a close-knit local construction community. The modest size of the firms and the use of labour-only subcontracting, in addition, suggest a more direct management involvement with site production and subcontracting activities. All these factors foster the emergence of an 'atmosphere' between homebuilders and subcontractors. In this context the features of the quasifirm are immediately recognizable. The commercial contractors, on the other hand, operate in a larger geographical area and across states. By having access to a larger pool of resources, they can select/replace subcontractors more easily. In large and more complex organizations, in addition, the management in charge of outsourcing production is generally not directly involved with construction activities, and therefore is less sensitive to atmosphere issues. There is an inclination to consider a subcontracting relationship more as a spot and techno-economic exchange than as a 'satisfying exchange relation' to be developed over time through repeated jobs. In this case the governance structure of contractor and subcontractor relationship gets closer to that of a pure competitive market.

Without doubt the thrust towards future effective measurement of transaction costs should start with an initial comprehensive classification of their components before and during the execution of contracts. In this case the focus of analysis should be a limited set of firms engaged in the same type of construction work and the gathering of transaction and production cost data. The overall objective of the study is to verify whether the combination of the two costs is effectively minimized according to the chosen governance structure. The authors are aware of the difficulty of this task. In this regard, Williamson's concept of 'atmosphere' suggests a possible alternative, namely the consideration of the price differential that a contractor is willing to pay for retaining the services of a 'trusted' subcontractor instead of choosing any lowest bidder. This additional cost (i.e. the premium for a better 'atmosphere') is a rough indicator of the transaction cost differential between the two alternative contractual structures. This indicator does not reflect a direct measurement, but instead the decision makers' perception of costs, as they are incurred within a chosen governance structure and may be incurred within an alternative one.

Conclusions

Table 3 highlights the main characteristics of the observed samples of home building and commercial construction.

The quasifirm, as suggested by the subcontracting practice of the homebuilders sampled in 1978 and 1999, is less evident as a form of organization in the 1998 sample of surveyed commercial contractors. Out of the four features of the quasifirm, only two are common to these two types of construction firm: long term business relationships with subcontractors, and use of negotiated subcontracts.

The commercial contractors' business relationship with subcontractors is strongly influenced by their need for maintaining competitiveness in a market segment that is characterized by more open competition and more frequent recourse to competitive bidding than that of homebuilding. In this regard, the growth of opportunistic behaviour is probably reduced by repetitive contractual transactions over a long period of time. Commercial contractors subcontract most of the work. This practice is driven by the need for limiting overhead costs and, above all, liability exposure. Subcontracting attempts to transfer this last risk to subcontractors. In this regard, we expect the use of more 'complete' contractual agreements than those used by homebuilders.

Williamson's 'atmosphere' can be used to explain the behaviour of homebuilders. Their selection and

Table 3 Comparison of the main characteristics of the homebuilders and commercial constructors sampled

Homebuilding 1978 survey	Commercial construction
The surveyed homebuilders are modestly sized firms.	The surveyed general contractors are medium and large firms.
Few subcontractors are used for each category of work.	A larger number of subcontractors is used for each category of work.
Homebuilders and subcontractors cooperate in a highly recurrent way over long periods of time.	General contractors and subcontractors may not cooperate in a highly recurrent way; nevertheless they entertain long term business relations.
There is a significant use of labour-only subcontracting.	Minimal labour-only subcontracting exists.
Formal competitive bidding is used in only 20% of the cases. Various forms of negotiated subcontracts prevail.	Various forms of negotiated subcontracts are used, depending on market conditions. There is more emphasis on creating competition among subcontractors.
High rate of subcontracting with sizeable self-performed work.	Very high rate of subcontracting with minimal self-performed work.
Lower overhead costs and construction costs, insufficient amount of work and supervision problems are the main reasons for subcontracting.	Reduction of liability exposure, lower overhead costs, market volatility and shorter construction time are the main reasons for subcontracting.
The average number of subcontractors invited to bid for a given category of work is (probably) very low.	The average number of subcontractors invited to bid for a given category of work is relatively high (six).

management of subcontractors is probably influenced by the need for maintaining a satisfying exchange relation, given the fact that subcontracting options are reduced by the limited geographic size of the market in which homebuilders operate and that successful labour-only subcontracting builds upon established good working relationships. This need is somewhat diluted in the case of the commercial contracting firms in which size and delegation, and lack of labour-only subcontracting, contribute to create a more bureaucratic and anonymous business relationship.

The survey, in addition, has shown that the contractual relationship between commercial contractors and subcontractors is strongly dependent on the type of relationship between owner and general contractor in a given project. Negotiated contracts with the owner foster a type of business relationship with a subcontractor that is closer to that of the quasifirm. Without doubt any future thrust toward semi-integrative forms of organizations, such as the quasifirm, depends also on the evolution of the typical contractual relationships between clients and contractors, and of construction industry culture.

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