Long Run Relationships, Vertical Integration and International Competition: Can They Contribute to Explaining Regional Construction Cost Differences?

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Abstract: The existence of opportunistic behavior by contractors or sub-contractors in the bidding process encouraged by the governance structure of construction companies as well as the kind of relationship that exist between contractors and clients is thought to have some bearing on the rising construction cost observed in some regions of Sweden. Three hypotheses that are intended to test the impact that long run relationship between contractors and developers, vertically integrated firms, and the increase of international competition could have on the construction cost increase levels were tested on a predetermined number of projects from six cities in different regions. The semi-structured survey produces inconclusive results. Long run and collaborative relationship was prevalent in small region though respondents in this region did not draw strong connection between construction cost increase levels and the kind of observed relationship. In Stockholm region, short-term relationship was mostly prevalent. Vertical integration and foreign competition impacts on construction costs were not significant in either region.

Key words: Construction costs, competition, long-term relationship, vertical integration.

1. Introduction

Swedish housing construction costs has risen more than the rate of inflation during the last decade. The effect of the construction costs escalation was not evenly felt in all regions and there was also an imbalance of housing stocks in various regions [1]. Some regions of the country, i.e., metropolitan regions (Stockholm, Gothenburg and Malmö) experienced a soaring construction costs whilst small regions felt lower construction cost increases [2]. The supply of new residential apartments stagnated at the same time the constructions costs were high particularly in the metropolitan regions where the housing demands were stronger.

There is countless literature dealing with the problems of the high construction cost but only few

studies tackle this issue within the context of changing economic conditions and governance structure of construction firms. In order to unearth the roots of escalation construction costs disparities between large and small regions, one can put the lenses solely on the component of construction costs—direct and indirect costs and anticipate that unit price (labor, materials, and equipments) and overhead costs differences that exist between the regions will explain the observed divergences. Another alternative is to examine other factors such as supplier structure and client-contractor relationship as well as competition and expect that some overhead and transaction costs associated with them would explain the differences of cost escalation between the regions.

The unit price variations between the large and small regions can persist up to a point where trading of the materials and labor movement becomes uneconomical. In the absence of any institutional restrictions such as labor regulations and tariffs,

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construction workers and materials will be constantly and freely transferred from low to higher economic rent places of these resources. Inflation is one general factor that influences the unit prices of construction input resources and only a national measurement of inflation occurrence exist in Sweden but not regional. Thus, a systematic comparative study of regional construction unit prices may be difficult if not impossible.

The organization structure of construction industry as well as competition and level of construction activities encourage opportunistic behavior and market driven attitudes that are detrimental the dyad relationship developed between the parties and consequently increases construction costs due to the excessive transaction costs. Improved relationship and integration of key stakeholders are critical to deal with what is perceived as industry's underperformance, inefficient, fragmented and wasteful [3]. In order to improve the relationship between different parties in the building process or propose any sort of integration, one may need to discuss the nature of construction industry and the organization structure of house-building sectors. These two key concepts—relationship and integration—will be the line of reasoning that our analysis of factors causing regional construction cost escalation disparities is also based.

Against this backdrop, three hypotheses that could explain the implications of supplier structure, the degree of working relationship between contracting parties, and the level of foreign competition on construction costs were put forward. The aims of this paper are twofold: First, it is intended to ascertain factors that developers perceive crucial to the construction costs increases; Second, it tries to evaluate respondent views on factors influencing construction costs based on these hypotheses, LRR (long run relationship), vertical integration and foreign competition by testing their statistical validity.

The rest of the paper is organized as the following.

Section 2 covers literature review and some brief discussion of the research issues. Methodology and project descriptions are described in Section 3. Section 4 contains the results of the questionnaire that respondents perceive as the cause of construction costs disparities among the regions. Discussions and analysis of results especially the responses related to long run relationship between client and contractor, vertical integration, and foreign competitions are treated in Section 5. Finally, a short summary can be found in the last section of this paper.

2. Theory and Literature Review

The cyclicity of the construction industry especially the housing building sector plays big role in determining the longevity of the relationship that exist between contractors and clients or between contractors and their sub-contractors. A sector study carried out by the NIB Capital Bank [4] exemplifies how small and medium sized construction companies might suffer most from the cyclicity and how long-term relationship might provide a solution to fluctuations in demand.

One can argue that relationship and integration are two opposite strategies not complementary ones if we assume that London and Kenley [3] imply physical integration of key stakeholders not integration in the sense of cooperation. First, the need of long-term relationship diminishes if the actors of the construction process are integrated and have unified management. Second, in the absence of integrated actors, long or short-term relationship becomes the alternative strategy to successfully undertake building projects because of the nature of the construction industry that is characterized to be project-based activity where the relationship lasts during the undertaken project. In other words, project collaborating dominated the working relationship between the parties rather than strategic collaborating that could have lasted longer. Thus, the direct or indirect benefits experienced by the players in the

industry cannot be long lasting due to the nature of construction industry and varying economic conditions.

A feature of construction industry that brings to the fore the concept of relationship is the extensive use of subcontracting. Eccles [5] states two prominent characteristics of the construction industry that resonate the relationship prevalence between construction actors, the organization of the production work force into a variety of trades and the practice of subcontracting parts of the project to other contractors and subcontractors. Subcontracting develops a set of stable relationships between the general contractor and special trade subcontractors, called quasi-firm that is in some way intermediate to market and hierarchy [6]. Good past relationship with contractor among other factors was found to have the greatest effect on lowering the subcontractor's bid to general contractors [7]. 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).

There is a large amount of literature and research about vertical integration and its application in different industries such as electricity markets [8], cable television industry [9], Gas supply [10, 11] and Pulp and Paper industry [12]. Bushnell et al. [8] suggest that vertical integration dramatically affects estimated market outcomes. Traditional approaches to vertical integration have tended to focus on vertical integration as a response to preexisting market power problems or as a strategic move to create or enhance market power in upstream or downstream markets [13]. Acemoglu et al. [14] state that contracting costs and financial development by themselves appear to have no effect on vertical integration. However, integration could exacerbate coordination and control problems further contributing to poor project performance [15].

In spite of limited theoretical support of vertical integration and its applicability on construction firms,

it could be speculated that the structure of residential construction firms (vertically integrated) influence the construction costs. The reason behind this speculation is that many construction projects are so enormous and only few large vertically integrated firms can undertake. Swedish vertically integrated firms, which have strong financial muscles to undertake numerous large developments [16] may tender higher price for a new rental or condominium projects. On one hand, winning that contract safeguards the prices of other similar properties own by the integrated firm. On the other hand, not winning the tendered contract will not exempt them developing rental units or condominiums of their own and still be competitive in the market. They can divert those resources, e.g., machinery and equipment to other projects undertaken by the firm without incurring too much loss of productivity. Their strong financial position also allows them to survive even if they loose few customers by raising opportunistically the construction costs.

Presence of foreign contractors and subcontractors may not only increase the competition and lessen the dependency of fewer actors in the deliverance of building projects but it also enhances the availability of construction workers as well as cost-effectively construction materials. The cost of construction materials, which constitute approximately one-third of total construction costs, have shown price increases over and above other industrial products, with price rises even during periods of low demand [17]. One of the reasons is that construction trade is concentrated to a small number of large companies i.e. one company accounts for more than 50% of total sales of cement, reinforcement steel and plasterboard.

3. Methodology and Project Descriptions

Vermande and Mulligen [18] describe three approaches for comparing costs of building of a hypothetical international project and they are: (1) standardized identical buildings; (2) standard building with local modifications; (3) functionally similar

building. The first two approaches seem to be theoretically possible but practically difficult to carry out due to the differences that exist in architecture, standards, availability of projects, etc.. The third approach of typical, functionally similar buildings is suitable in our regional comparative study.

In Sweden, the three main owners in residential apartments are municipal housing companies, private real estate companies, and tenant-owner associations. All rented housing is built with some form of financial public support [19]. Thus certain information related to production costs and project specifics are reported to the authority. Information of condominium projects especially cost related ones are not easily available since majority of the contractors who carried out the construction work are also developers and thus the final transaction is included not only the construction costs but land cost as well as profits. There are also considerable price differences in condominiums because of amenities and luxuries associated with. These two facts were enough to exclude condominiums in our survey and concentrate only the rental projects.

A survey was carried out in Stockholm and five medium cities that are deemed to represent regions for both escalating and non-escalating costs (Table 1). Projects that were built between 1998 and 2003 are considered in the survey since that period encompasses both high and low construction activities. Only projects that contain more than 20 units and equipped with elevator were chosen in order to have functionally similar buildings.

Questionnaires were addressed to project managers that were in charge in the projects. Each questionnaire contained thirty-seven questions based on factors that were identified from the literature and informal discussions with professionals. Closed questions and Likert scaled-response format questions that elicit structured response from the project managers were employed in this six-part questionnaire. From quantitative point of view, 63% response rate of the preliminary survey (33 out of 52) seems very high compared with the typical 20%-30% postal questionnaire surveys of the construction industry. Only ten questionnaires were answered fully and properly while the rest of respondents preferred to complete the questionnaire during the interview. Construction industry professionals were also interviewed in order to gather their views of the construction cost increase disparities.

4. Survey Results

Factors that were raised as the cause of construction cost disparities are competition and local market conditions and labor costs. It has been indicated that medium size construction companies with 50 or less employees are dominant in the residential construction market in non-metropolitan cities that makes competition among them highly noticeable. Respondents have noted that this reflects why developers in small-medium cities do not only consider the lowest price the sole criteria for choosing contractor but also consider the relationship between parties, quality of product delivered, and reputation of

Table 1 Surveyed projects.

City	Type of developer			Number of respondent (both mail and interview)
	Municipal	Private	Tenant-owner association	
Stockholm	9	7	3	12
Västerås	4	1	-	4
Örebro	6	1	-	6
Linköping	2	4	2	2
Jönköping	2	-	-	2
Umeå	8	3	-	7
Grand total	31	16	5	33

the contractor.

In Stockholm, respondents believe that construction costs were higher in those years because of market conditions (high demand) that were in favor to contractors. In other words, contractors have had the upper hand and selected only those projects that they could make extra profit and developers were competing for the few contractors that were offering their services. Lucrative constructions of condominiums have had also big impact on construction costs in residential apartments. Early nineties condominiums were very profitable and that might have driven up the construction costs. The cost increases may have persisted and had spillover effect on other types of housing.

Labor cost and the price of construction material influences on the construction costs were investigated and produced a mixture of views. Labor in big cities may cost more in order to compensate them commuting expenses, high rents, etc.. Several respondent believes that labor cost is may be one factor that has biggest impact on construction costs due to labor laws and salary structure in the sector.

Several respondents believe price differences of construction material in various regions of the country may be negligible. They also indicated that material products get easily transported locally although they have different opinions in foreign materials. For instance, cheaper prefabricated concrete elements in Umeå got transported to Stockholm every Monday was one example given by industry insider.

The two regions do not only differ the level of construction costs of the surveyed projects (compared to similar projects in respective region) but they also differ the number of projects that have experienced overruns costs and exceeded their original budget. Construction cost of all the projects from small cities except one project were reported to be within the average construction costs of their regions (Table 2).

Conversely, several projects from small regions have reported to exceed the original budget when

respondents were asked the level of the construction cost of the same project with respect to its original budget. Only one project in small regions have encountered higher construction costs than similar projects in the region but the number of projects that exceeded their estimated budget was almost twenty percent of the surveyed projects in the small regions.

Several projects in Stockholm reported that construction cost of their project were more than the average construction costs of the region. Good number of projects has experienced somewhat higher or much higher construction costs compare to the original estimated cost. Construction costs of some projects in both regions were reported to be high because of its location dependency (i.e., Hammerby sjöstad—delicate soils), strong demand of the construction works existed in that time, high quality requirements, and design changes initiated by the owners. Respondents along the region affiliation gave different accounts of what has caused the overruns. All the respondents from the small region claim that the construction costs were higher because of the design changes initiated by the owner and not excessive costs inflicted by the contractor. Respondents in the Stockholm region have indicated that contractors were mainly responsible the extra costs of the projects incurred by the owners except when labor disputes prolonged the completion time of the projects. They claim that contractors were opportunistically increasing the construction costs and capitalizing the higher demand of their services during the upbeat construction market.

Two issues that are always associated with cost increase were quality and completion time of the

Table 2 Construction cost and relative construction cost levels (in brackets) by region type.

Construction cost level	Region type	
	Big region	Small region
Low	2 (1)	1 (1)
Average (within budget)	6 (2)	19 (13)
High	4 (9)	1 (7)

project. Factors contributing to delays or quality inferiority were not the focus of the survey but the occurrences of either anomaly were investigated. Four municipal projects in Stockholm have experienced delays and dissatisfaction of the quality of the projects. Though developers accepted that certain delays cannot be blamed on contractors and indicated their willingness to share the costs of the delays, they also pointed out that delays induce the contractor to hasten finishing the job that could result deficient quality work. Nevertheless, most of the claims and disputes were solved through mutual agreements.

The survey also shows that extent in which metropolitan and small regions use different contract form and tendering process, which may have some implications on construction costs. Most of the projects in small region were under the control of a single contractor with all-in-one contract form and reported average construction costs. Only one project under general contract was reported to have higher construction costs. Meanwhile, two thirds of projects in Stockholm used general contract form and four of them incurred higher construction costs. Since the coordinated contracts entails the participation of several contractors and subcontractors, respondents pointed out that this type of procurement can increase the construction costs in two aspects. First, sometimes substandard or deficient work become no one fault and subsequent repair necessitates extra cost succumbed by the developer. Second, developers incur extra costs stemming from coordination and monitoring of the various actors and activities, not to mention the demand of greater competence from developers. Small region companies have indicated that employing All-in-one contract procurement

method with one or two large contractors over a period of time have provided an opportunity to foster a long-term relationship and consequently less unjustifiable construction costs increases.

As we have contend at the beginning of the paper, these typical factors of direct and indirect costs may not be enough to elucidate the cost escalation differences that exist between large and small regions. In the next section, we will explore other factors that could explain the cost disparities by testing the three hypotheses that we have put forward earlier in relation to the construction costs.

5. Discussion and Analysis of Results

A meaningful analytical of the survey answers is quite difficult if not impossible due to the size of the sample and the quality of the responses and thus mainly descriptive and limited analytical discussions will be conducted.

5.1 Hypothesis 1

A long run relationship between contractor and client tends to a lower cost increase during the boom. In this hypothesis, we postulates that if the actors in the construction process especially contractors and developers establish a good lasting working relationship, it may inhibit contractors or subcontractors' enticement to increase construction costs in hot markets.

Most of the developers in big region agree that LRR would decrease construction costs while the opinion of the developers from small region about long term relationship affects on construction costs is evenly divided in the three response options (Table 3). About one third of them agree that long run

Table 3 Region Type by Long-Run relation and Construction costs.

Region type	LRR (Long run relation) and CCs			Total
	Decrease costs	Cost Un-affected	No opinion	
Big region	9	1	2	12
Small region	8	7	6	21
Total	17	8	8	33

relationships decreases construction costs while other two thirds either believe that LRR has no implications on construction costs or simply do not have opinion.

In Stockholm, municipal companies did experience LRR with contractors but it was hardly characterized mutual because project bulkiness and large contractor shortage always constrained developers' choices. Some private developers have specified that when they were not satisfied the cost and quality of one project that has affected their decisions working with that contractor in another project. Meanwhile, a developer (municipal), despite their dissatisfaction with the contractor on both the quality and cost, decided to do the opposite and work with the same contractor in another project. The response from the respondent when asked the rationale behind that decision appear to mirror what Bidder [20] described as client/contractor relationship mutual metaphor (Table 4).

First, few competitors offered their service of undertaking the second project and none of them tendered a lower price (competition regulatory policy) than the first contract did. Basically, there was a shortage of contractors who were capable of undertaking that kind of workload financially and technically (285 MSEK project). One municipal company respondent has mentioned that some times political pressures to speed up project implementation constrains their search of viable contractor and forced them to accept higher estimated bids that could have been avoided had they have time to extend the tender period or delay the project until construction activity cools down. Second, knowing what kind of contractor that we are dealing with gave us an opportunity to envisage the desired outcome and hence device an appropriate tool to achieve it rather than starting new adventure with another contract. Third, the

relationship with the contractor is multi-dimensional and one has to look the overall performance of the contractor, which has been satisfactory in all other areas except these increased construction cost emanated from the poor quality.

Good working relationship did not only produce non-increasing construction costs (average or lower) for the developers but it also secures more projects for the contractor as some respondents expressed. Municipal company in small region reported that a collaborative working relationship with the contractor resulted lower construction costs for them and consequently more work for the contractor. A practice that is much related to the LRR is the prior commitment of repeated work with the contractor and all the respondents from small regions and two thirds of big regions rated as important factor. Respondent indicated that this practice is not formal promise but rather informal one where a contractor undertakes a project that is part of similar successive projects. The developer desires to maintain uniformity of the projects and contractor needs for steady workload. It is win-win situation for both actors where accumulated information and skills acquired from one project get utilized in subsequent project. One respondent stated that three more projects were rewarded same contractor after very successful delivery of an earlier project as result of LRR.

Private developers are not obliged to practice strict competition regulatory as Municipal companies do. For instance, open tender and lowest bid price must be practised in the public procurement when choosing a contractor, which does not encourage municipal companies to exploit the benefits of LRR. How municipal companies balance between competition required by the law and cooperation necessitated by the market? In other words one municipal company

Table 4 Client/contractor relationship: mutual metaphors.

Topic	Client's thoughts	Contractor's thoughts
Clients	A dog's life	Our life blood or a necessary evil
Contractors	A necessary evil	A dog's life

practised what much literature termed as “coopetition” where client tries to balance both the benefits of competition and cooperation. The respondent described a case where a losing contractor complained that a project was not rewarded on the basis of lowest bidding price policy and thus forced tender to be re-opened. The lowest bid price was replaced with best offer strategy that has enabled the municipal developer to consider not only the price but also previous working relationship and past project performance with the contractor.

The test shows that we can reject the null hypothesis (10% significance level) that there are no differences in developers’ opinions about whether long run relationship between clients and contractors affects construction costs (Table 5). Both the asymptotic and Exact Sig. are less than the 10% significance level and we reject the null hypothesis. In other words, we can conjure that the existence of long run relationship in the small regions may have helped to prevent opportunistic behavior between the parties though only one-third of developers in the small region acknowledged the benefits of LRR (Table 3). Developers in big regions also vehemently agree that LRR decreases construction costs but they also have reported higher construction costs.

5.2 Hypothesis 2

If the contractor on the rental housing market is also active as developer on the same market, the construction costs tend to be higher. The research question is to substantiate any connection between vertical integration and higher construction costs increase. In other words, there is a difference of

opinions between the developers in large and small regions on whether a vertically integrated firm tenders higher price than non-integrated firm. A Mann-Whitney U test shows that we can reject the null hypotheses (at 10% significance level) that state vertically integrated contractors operating in both regions do not tender higher prices than non-integrated contractors (Table 5). In other words, there is a difference of opinions between developers of large and small regions and indeed one can infer with cautious that vertically integrated contractors could influence construction costs.

In some small region municipal companies where the highly dependence of the services of few large contractors and the dissatisfaction of employing divided or coordinated general contracts is making their situation to be described as between stone and hard rock. Large contractors have often chosen not to participate in a coordinated contract. One possible explanation given by the respondents was that contractors margin of profits may diminishes with this procurement method because large contractors, including vertically integrated contractors make their profits from different source such as labor, material, land cost. Non-participation could also be the result of contractor’s strategic decision of prioritizing other projects including his own projects.

Several explanations could be given why vertical integration was not big issue in the Stockholm region. Higher overhead costs as result of being vertically integrated coupled with high construction activities and fewer competitions may have exacerbated the construction costs in the big regions. Size of projects and limited easily constructible land that requires

Table 5 Mann-Whitney U test statistics (grouping variable: region type).

	LR relation and CCs	Foreign main contractor	Imported material	Vertically integrated
Mann-Whitney U	42.50	40.00	15.00	7.00
Wilcoxon W	162.50	145.00	120.00	112.00
Z	-2.167	-2.782	-3.474	-3.844
Asymp. Sig. (2-tailed)	0.030	0.005	0.001	0.000
Exact Sig. (2-tailed)	0.040	0.009	0.000	0.000

special techniques and equipments may have limited the number of qualified contractors. Thus, the few capable contractors benefit from the low competition with the privilege to choose the most profitable project. Small regions may have benefited the presence of many medium and small construction firms that have at least not only increased competition but also contributed the fostering of long run relationships between with the developers.

5.3 Hypothesis 3

If it is easier for foreign suppliers to enter the market, then cost increase will be lower. The final hypothesis that regards the foreign contractor and subcontractor participation would decrease construction cost was statistically validated. The null hypothesis that there are no differences in developers' opinion about the impact of foreign supplier presence on construction costs was rejected at 10% significance level. While all the respondents from Stockholm region have certain opinion about the influences of foreign supplier on construction costs (8 agree and 4 disagree), developers from small region either have agreed with the statement (10 out of 17) or have no opinion at all.

Developers' responses about the effect of vertical integration and long run relationship on construction costs raise an interesting observation. Developers in the Stockholm region, where higher construction cost increases of the projects are observed and most of the projects are constructed by vertically integrated firms, have different perceptions than small region developers, who believe that vertically integrated firms tend to tender higher prices. Meanwhile, small region developers who reported to have lower construction cost increases and long run relationship with contractors indicated that they do not perceive that lower construction cost increases were a result of that relationship. Developers from Stockholm region (who mostly experienced non collaborative relationship with the contractors) believed more in the

benefits of long run relationship compared to their counterparts in the small regions. It is possible that developers from both regions responded to these questions (long run relationship benefits and vertically integrated firm's tendering behavior) from an expectation point of view rather than the situation they were operating in. In other words, the responses of small region developers were driven by concerns that the market power of a vertically integrated firm may lead to unfair pricing whilst the responses of Stockholm region developers were motivated by the desire of having long run relationship in the face of high competition and high construction activity that encourages market driven attitudes.

6. Conclusions

Semi-structured interviews and posted questionnaires yielded mixed results. In non-metropolitan region, long-term relationship between developer and contractor is a crucial strategy and incentive mechanism in securing repeated work for contractors and lower construction costs increase for the developers. Short-term relationship as well as normal and adversarial relationship was more prevalent in metropolitan region. The working relationship is also get affected by the level of construction activity, project characteristics (size, complexity, etc.). Many developers did not recognize the effects of vertically integrated contractors on construction costs and hence the relevance of concentration levels of vertically integrated firms in any region became inconsequential.

The involvement of foreign contractors was not reported in any project considered in the study and the usage of imported materials was almost non-existent. However, some respondents believe that foreign suppliers' participation might increase competition especially construction materials and labor and thus alleviate the rising construction costs in big regions. Other respondents agree partially with that assessment but argue that cheaper construction materials are

offset by higher transportation and maintenance costs.

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