

N00228-85-G-3247

1

AD-A220 717

GENERAL CONSTRUCTION CONTRACTOR
BIDDING STRATEGY VARIATIONS
BASED ON MARKET CONDITIONS

A Special Research Problem

Presented to

The Faculty of the School of Civil Engineering
Georgia Institute of Technology

by

Ronald S. Barr

In Partial Fulfillment

of the Requirements for the Degree of
Master of Science in Civil Engineering

Georgia Institute of Technology

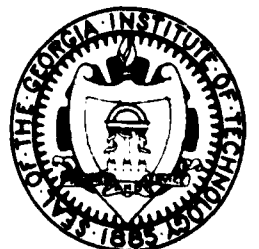
March, 1990

DISTRIBUTION STATEMENT A

Approved for public release;
Distribution Unlimited

GT

GEORGIA INSTITUTE OF TECHNOLOGY
A UNIT OF THE UNIVERSITY SYSTEM OF GEORGIA
SCHOOL OF CIVIL ENGINEERING
ATLANTA, GEORGIA 30332



04 17 00

GENERAL CONSTRUCTION CONTRACTOR BIDDING STRATEGY VARIATIONS BASED ON MARKET CONDITIONS

A Special Research Problem

Presented to

The Faculty of the School of Civil Engineering
Georgia Institute of Technology

by

Ronald S. Barr

In Partial Fulfillment
of the Requirements for the Degree of
Master of Science in Civil Engineering

Approved:

Faculty Advisor/Date

Accession For	
NTIS CRARI	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By <i>perform 50</i>	
Distribution/	
Availability Codes	
Dist	Availability or Special
<i>A-1</i>	

ABSTRACT

General construction contractors develop bidding strategies to guide them in determining what jobs to bid and how to bid those jobs. The objectives of this paper are to identify the market-condition related factors that the contractors consider when devising their bidding strategies and determine how they vary their bidding strategies based on those factors. *to model contractor bidding*

to model contractor bidding
to model contractor bidding

to model contractor bidding

TABLE OF CONTENTS

	PAGE
CHAPTER 1: INTRODUCTION AND OBJECTIVES.....	1
1.1 Introduction.....	1
1.2 Objectives.....	2
CHAPTER 2: DATA COLLECTION.....	3
2.1 Literature Review.....	3
2.1.1 Market-Condition Factors.....	3
2.1.2 Bidding Strategy Variations.....	3
2.2 Approach to Data Collection.....	4
2.3 Area of Survey.....	4
2.4 The Survey Form.....	5
2.4.1 Gross Revenue.....	5
2.4.2 Fundamental Bidding Strategy.....	6
2.4.3 Factors.....	7
2.4.4 Gaging Market Conditions.....	7
2.4.5 Predicting the Future.....	8
CHAPTER 3: SURVEY RESULTS.....	9
3.1 Introduction.....	9
3.2 Fundamental Bidding Strategy.....	11
3.3 Analytical Tools.....	13
3.4 Quantity of Work Available: Seasonal Basis...	14
3.5 Quantity of Work Available: Over One or Several Years.....	14
3.6 Competition.....	16
3.7 Economic Conditions.....	18
3.8 Labor Environment: Own Labor Force.....	19
3.9 Labor Environment: Additional Hires.....	20
3.10 Labor Environment: Labor Unions.....	21
3.11 Subcontractors.....	22
3.12 Equipment and Operators.....	25
3.13 Cash Flow.....	25
3.14 Overhead.....	27
3.15 Other Considerations.....	28
3.16 Gaging Market Conditions.....	29
CHAPTER 4: CONCLUSIONS AND FUTURE RESEARCH.....	32
4.1 Conclusions.....	32
4.2 Future Research.....	33
REFERENCES.....	35

APPENDIX..... 36

Contractor Interview Form..... 37

Cover Letter to Contractor..... 40

CHAPTER 1

INTRODUCTION AND OBJECTIVES

1.1 Introduction

There is much more to successfully bidding for construction work than accurately determining and pricing the material, equipment, and labor requirements for a job. "The bidding process can be expensive, involving direct costs for information search, evaluation of specifications, subcontractor solicitation, and proposal preparation." [Boughton 87] A contractor can not afford to haphazardly bid on jobs. He must formulate some economical approach to obtaining work that will provide him the right volume at profitable prices. General construction contractors develop bidding strategies, either precisely or loosely defined, to guide them in determining what jobs to bid and how to bid those jobs.

Contractors must consider many factors when they develop their bidding strategies. Boughton found in his survey (with useable responses from 126 general construction contractors from around the United States) that the factors in developing a bidding strategy (in descending order of importance to the contractors) are:

1. Clearness and detail of specifications
2. Past experience with similar work
3. Confidence in subcontractor bids
4. Location of project
5. Number of competitors

6. Duration of project
7. Workload
8. Market condition (busy or slow)
9. Size of bid
10. Opportunity for follow-on work
11. Relationship with architect/owner
12. Competitors bid history
13. Confidence in external events (interest rates, inflation, etc.)

Boughton concluded from this survey that the general construction contractor's number one concern about a prospective job is how well he will be able to control the construction process. However, the market conditions (more broadly defined than simply how much work is available) play a substantial role in the development of a contractor's bidding strategy.

1.2 Objectives

The objectives of this paper are to identify the market-condition factors that general construction contractors consider when devising their bidding strategies and determine how they vary their bidding strategies based on those factors.

CHAPTER 2

DATA COLLECTION

2.1 Literature Review

The literature review was conducted in the libraries at the Georgia Institute of Technology and Georgia State University, both in Atlanta, Georgia; and the library at the Southern College of Technology in Marietta, Georgia. Very little information was found that related contractor bidding strategies to market conditions.

2.1.1 Market-Condition Factors

In addition to Boughton's article referred to previously, articles by [Ahmad 88] and [Tavakoli 89] and a book by [Berger 77] indicated factors that could be included under the general heading of "market conditions." These factors were used to prepare the survey form described later.

2.1.2 Bidding Strategy Variations

The few possible bidding strategy variations based on market conditions found in the literature search are:

1. Contractors are more (less) selective of jobs and seek more (less) profit when more (less) work is available. [Boughton 87]
2. General contractors reduce the amount of work they subcontract so they can bid tighter in a lean market because there are fewer layers of markup and they can better control the

work.[ENR 84]

3. Contractors seek out projects with higher risks, higher returns, and fewer competitors.[ENR 84]

4. When labor is readily available, workers tend to make a special effort to put in a good days work; when labor is scarce, laborers are less productive. Contractors must account for these variations in productivity when they prepare their labor estimates.[Berger 77]

2.2 Approach to Data Collection

Because of the limited amount of information on this subject found during the literature review, virtually all of the information was collected by surveying general construction contractors. Three alternatives for conducting the survey were considered. A telephone survey was chosen over face-to-face interviews or mailed survey forms because of the convenience and time efficiency for both the author and the contractor (compared to a face-to-face interview) and because it allowed for interaction between the author and contractor to assure a more consistent understanding of the questions (compared to mailed survey forms) and to allow probing by the author. In a few cases, the company representatives wanted to respond to the survey via mail and survey forms were sent to them.

2.3 Area of Survey

The survey was restricted to companies with their home office

or a branch office in the Atlanta, Georgia, area. The companies were selected primarily from the top 25 general contractors in the Atlanta area as listed in the 1988 edition of the *Atlanta Business Chronicle*. The range of latest available annual gross revenues for the companies was \$3.5 million to \$1.25 billion with a mean of about \$225 million. There was not sufficient data collected to evaluate variations in bidding strategies based on gross revenues.

In each case, someone in the contractor's estimating and purchasing shop responded to the survey. The representatives' position titles included chief estimator, head of marketing, and vice president for estimating. For convenience, the general construction contractor representative who responded to the survey, since he spoke on behalf of the contractor, is usually referred to simply as the "contractor" throughout the remainder of this paper.

2.4 The Survey Form

The survey form was designed to solicit the needed information while limiting the time of the interview to 15 to 30 minutes (in consideration of the value of time to the busy executives responding). At the beginning of each interview, the respondent was told the purpose of the survey and assured that all reporting would be strictly anonymous (no company or personal names used).

2.4.1 Gross Revenue

The first question on the survey form asked the contractor to state his most recent available gross revenue. As it turned out,

this question was superfluous because there was not sufficient data collected to evaluate differences in bidding strategies based on gross revenue.

2.4.2 Fundamental Bidding Strategy

The second question asked each contractor to categorize his fundamental bidding strategy and indicate if he uses any analytical tools when making bidding strategy decisions. The three strategies listed on the form are summaries of the strategies described by Boughton. Each contractor was read the brief description of each strategy and asked to identify which of the three, or what combination of the three, best describes his strategy; or to identify some other strategy he uses.

There are analytical tools available that assist contractors in making bidding strategy decisions. Tavakoli describes an expert system that helps the contractor determine the correct overhead and fee to include in a bid. The contractor must first determine a base overhead and a base fee in the usual manner. The expert system then provides a correction multiplier for overhead and one for fee based on the contractor assigning a numerical value (representing how he rates each factor) for each factor that applies. These factors include the market-condition factors (investigated in this paper) of competition, labor market, subcontractor market, and need for work. Other tools available to assist contractors in making bidding strategy decisions are quantitative analysis (which requires contractors to compile and analyze large volumes of data) and

bidding strategy models.

However, these tools are not widely used. Concerning the use of mathematical models in bidding strategy, Boughton said, "There is little empirical evidence to suggest that they have enjoyed widespread use or have practical application to most bidding situations." Ahmad said, "Contractors use experience, judgement, and subjective assessment rather than statistical or mathematical techniques to make bid decisions." Ahmad went on to say that only about 20 percent of contractors use statistical or mathematical techniques to assess competitive situations. The contractors surveyed were asked to identify any analytical tools they use.

2.4.3 Factors

The third question on the survey asks each contractor to identify the factors he considers in determining what the market conditions are and to tell how he varies his bidding strategy based on those factors that he considers. The factors listed on the survey form and the examples of possible variations of bidding strategies are a compilation of factors and variations found in various references and the author's experience. In each case, the contractor was asked to identify any factors he considers that were not listed on the survey form.

2.4.4 Gaging Market Conditions

The fourth question asks the contractor to identify the sources he uses to determine what the market conditions are.

2.4.5 Predicting the Future

The fifth question asks the contractor how far out into the future he considers predicted market conditions when preparing a current bid. For example, a contractor currently preparing a bid on a job that is expected to take two years to complete may be inclined to bid that job more aggressively if he predicts that a construction industry bust period will occur during that two years. He may view the job he is currently bidding as key to his survival during the bust period.

CHAPTER 3

SURVEY RESULTS

3.1 Introduction

The emphasis of this research was determining the factors that contractors consider in evaluating market conditions and determining the way the contractors vary their bidding strategies based on those factors. Therefore, the results are presented by factor in the order found on the survey form. Each contractor has been assigned a number so that reference to a particular contractor can be made without using company names. By following a number through the presentation of results, a reader can determine how a single contractor responded to the survey.

Table 1 on the next page summarizes the survey results. An "X" indicates the factors that a contractor stated he considers in his bidding strategy. The letters in parentheses next to the contractors' numbers in this table correspond with the fundamental bidding strategies discussed previously [(A) = Adaptive, (Q) = Quantitative, (S) = Strategic, and (N) = None of These]. In the following text, discussion of the responses and/or paraphrased comments by the contractors are presented. Unless otherwise indicated, any reference to a contractor varying a dollar amount (e.g., unit price, fee, overhead) indicates he would change his estimate for that item in his bid.

CONTRACTOR	FACTORS											
	A		B	C	D			E	F	G	H	I
	1	2			1	2	3					
1 (N)		X	X		X					X		X
2 (N)			X					X				
3 (A)		X	X	X	X			X		X		X
4 (Q)		X	X					X	X		X	
5 (Q)			X		X	X	X	X		X	X	X
6 (Q)		X			X			X		X		
7 (Q)		X	X		X							
8 (Q)		X	X		X		X	X		X	X	X
9 (S)			X			X	X	X				
10 (S)			X	X	X		X	X	X	X		X
11 (S)		X	X								X	
12 (S)		X	X					X		X		
13 (S)			X	X	X	X		X		X	X	
14 (A,Q)		X	X			X		X		X		
15 (Q,S)		X	X		X		X	X		X		X
16 (A,Q,S)	X	X	X	X		X	X	X		X		X
17 (A,Q,S)		X	X		X			X		X	X	X

Table 1 Survey Results - An "X" indicates the contractor considers that factor in his bidding strategy. (A) = Adaptive; (Q) = Quantitative; (S) = Strategic; (N) = None of These

3.2 Fundamental Bidding Strategy

Of the seventeen contractors surveyed, two (Contractors 1, 2) said they use none of these strategies, one (Contractor 3) uses mostly adaptive, five (Contractors 4, 5, 6, 7, 8) use all or mostly quantitative, five (Contractors 9, 10, 11, 12, 13) use all or mostly strategic, and four (Contractors 14, 15, 16, 17) use two or more of these strategies. Of those who said they use two or more, Contractor 14 uses adaptive and quantitative, Contractor 15 uses quantitative and strategic, and Contractors 16 and 17 use all three strategies.

Some comments made by contractors concerning their bidding strategies are:

1. Contractors 1 and 4 get almost all of their work by negotiating and if there is not enough negotiated work available, they will bid work but only on a selected bidders list basis. Contractor 1 does some fee bidding in which an owner gives the general scope of the job and determines which general contractor will charge the least for his services (e.g., fee, general conditions, site overhead). Neither does public work.

2. Contractor 2 said that his strategy is to diversify and bid in the market(s) (e.g., public, residential, commercial) that he thinks is the most desirable at the time. Once he decides to bid in a market, he does not vary his bid based on market conditions.

3. Contractors 3, 4, 5, 6, 7, 8, 9, and 14 do a lot or mostly negotiated work. When there is not enough negotiated work

available, they will bid on jobs. Contractor 6 stated that all contractors can get about the same material prices so the difference between competitors is their labor costs. His strategy to remain competitive is to closely manage his people to minimize labor costs and he does not reduce his fee or unit costs to be more competitive on a bid. Contractor 8 may reduce one or more of his fee, overhead, and unit prices when he has a reason to bid a job more aggressively. Contractor 14 does mostly low rise work.

4. Contractor 10 has a standard fee that he will not go below. If he does not think he can win a bid with that standard fee included he will not bid the job. He must include overall company overhead in the bid. This makes him less competitive on relatively smaller jobs (i.e., less than \$20 million) so he does not usually bid those jobs. When he varies his bid price he only adjusts his fee up or down (with contingencies included in his fee except that when liquidated damages are included in the contract he may put in a separate additional contingency cost).

5. Contractor 11 gets his work strictly by negotiation. He uses real estate brokerage firms to obtain work. He does almost exclusively large (\$0.5 million and above) warehouse work.

6. Contractor 12 selects his jobs mainly based on the owners involved. He mostly does repeat business. He mostly negotiates jobs but will bid on jobs if not enough negotiated work is available. He does not markup materials.

7. Most of the price variation that Contractor 13 does is in his unit prices. If he wants a job badly he will use lower unit

prices than he would use if he was not as anxious to get the job.

8. Contractor 16 said that the only pricing item he will vary is his fee. His overhead is based on what he projects his actual costs will be based on experience.

9. Contractor 17 said his bidding strategy varies with the job. He looks for low competition but sometimes bids volume when he needs the work. Also, he likes to bid jobs in areas where he has had success and jobs where he knows the owner and has had a good experience with him.

3.3 Analytical Tools

Only two contractors (12%) stated that they use any analytical tools to help them make bidding strategy decisions. Contractor 15 uses some quantitative analysis to help him make decisions on whether to bid and how much to bid. He categorized his fundamental bidding strategy as a combination of quantitative and strategic. It is not inconsistent that contractors who identified themselves as having quantitative fundamental bidding strategies do not use quantitative analysis to assist them in making bidding strategy decisions. Several contractors stated that many of the bidding strategy decisions are made based on perceptions or bits of information without formal collection and analysis of data.

Contractor 5 has a formula for determining his exposure and if his computed exposure is not acceptable, he will not bid on a job. Although he was not willing to discuss the formula in detail, he stated that it includes fee (he has a minimum fee regardless of

the size of the job), his own labor force (he will not take a job that requires his own labor cost to exceed his fee), and general conditions such as cash flow (the job must generate a certain amount of dollars per month).

3.4 Quantity of Work Available: Seasonal Basis

Only Contractor 16 stated that the quantity of work available on a seasonal basis is a factor in his bidding strategy. He stated that some work is highly seasonal. He gave as an example, mall renovations that are to be completed before Christmas. He said the jobs are available for bidding in October, November, and December. In October and November, he bids on the jobs he feels he has the best chance of getting. If he does not get the amount of work he wants in that time period he will tighten his bid (use a lower fee and maybe take a closer look at his anticipated overhead to see if he might have over estimated it) on jobs bid in December.

3.5 Quantity of Work Available: Over One or Several Years

Twelve contractors stated that the quantity of work available over one or several years is a factor in their bidding strategies. Some comments made by contractors are:

1. Contractor 1 uses a lower fee in his estimate if less work is available. Because he does not shop for low subcontractors, he has a good relationship with his regular subcontractors and gets preferred prices from them. This contributes to the contractor's competitiveness during lean times.

2. If there is less work available, Contractors 3, 7, 8, and 12 use lower overhead and fee in their estimates to try to win bids. Contractor 7 anticipates subcontractor estimates being lower during lean periods as they compete to get work. To reduce overhead during lean times, Contractor 8 performs some of the work with his own labor force that he would normally subcontract.

3. Contractor 4 will bid on more jobs during lean times to get the volume of work he wants. He may put less fee in a bid but he does not adjust his overhead.

4. Contractor 6 reduces his home office overhead in a bid when less work is available (gets rid of employees if necessary). He does not adjust his fee or his unit prices.

5. Contractor 11, who gets his work strictly by negotiation, will lower his beginning negotiating position if there is too little work available.

6. Contractor 14 lowers his fee and tightens up on time related unit prices when there is a lean market.

7. Contractor 15 expects more and hungrier bidders in the second half of a lean year as contractors begin to recognize that the volume of available work has declined. He tries to anticipate a lean year and bids more aggressively in the early part of the year to ensure he gets the volume of work that he wants.

8. Contractor 16 tries to anticipate lean periods and stocks up on work to carry him through that period. He looks for jobs that have delayed start dates or longer term (several years) construction schedules so that he will have enough work during the

anticipated lean period.

9. Contractor 17 prefers to do work in the Atlanta area but when work is less available he will bid on jobs outside the Atlanta area. He also lowers his fee during lean periods.

3.6 Competition

All but one of the contractors said that who and/or how many competitors there are for the job plays a role in their bidding strategies. Their comments are as follows:

1. Contractor 1 does not bid against contractors who shop for the lowest price from subcontractors and contractors who continuously underbid him.

2. Contractors 2, 3, and 13 might not bid on a job if there are too many competitors (Contractor 3 said about ten is too many; Contractor 13 said between six and eight is too many); but if they decide to bid, they do not change their bidding strategies due to the competition.

3. Contractor 4 will not bid on a job unless the bid list is pretty select.

4. Contractor 5 does not bid if there are more than four competitors because he feels that with more competitors the chances are too great that at least one of them needs the job badly and will underbid intentionally to get the job. He also avoids bidding against "home town favorites" and contractors who routinely bid low on jobs.

5. Contractor 7 might not bid on a job if there are a lot of

bidders. If he decides to bid against a lot of competitors he will lower his fee.

6. Contractors 8, 15, 16 and 17 might not bid on a job if there are a lot of competitors (Contractor 16 said nine or ten is too many, Contractor 17 said more than six is too many because the chance is too great that someone will make an error or intentionally underbid the job). They also avoid bidding against particular contractors who routinely underbid them or who they know need the work and will underbid to get the job. If Contractor 8 decides to bid against a lot of competitors, he may lower one or more of his fee, overhead, and unit prices.

7. Contractor 9 tries to get on select or invited bidders lists. He will not bid against a lot of competitors.

8. Contractor 10 will not bid against a lot of competitors on a small job but will bid against a lot (unless there are an unusually large number) of competitors on a large job. A particular competitor may cause him not to bid (e.g., a competitor who bids erratically; very low on some bids and very high on others).

9. Contractor 11 might lower his initial negotiating position if he knows that one of his tougher competitors is also negotiating for the job.

10. Contractor 12 lowers his overhead when he is competing against three or more bidders.

11. Contractor 14 lowers his fee and time-related unit prices when there is a lot of competition.

3.7 Economic Conditions

Contractor 3 said that taxes are a consideration in his bidding strategy. All of the contractors who stated that economic conditions are a factor (Contractors 3, 10, 13, 16) said they consider inflation. No other economic conditions were identified as factors in bidding strategy decisions. Comments by the contractors are:

1. Contractors 3 and 16 escalate costs based on current and projected inflation when they are bidding on a job that has a work start date several years in the future.

2. On jobs that construction will cover more than one year, Contractor 10 uses his projected construction schedule for the job to predict the materials he will buy each year and escalates those materials based on projected inflation. He asks suppliers what their escalation will be and also tries to get suppliers to give firm commitments on material costs for as far in the future as possible. To minimize his risk on jobs that construction will cover four to five years, Contractor 10 tries to subcontract more of his work and tries to get firm-fixed-price contracts with the subcontractors to shift the risk to them.

3. Contractor 13 escalates costs on jobs that will cover more than one year by adding a lump sum to each cost category (e.g., labor, materials) to account for anticipated inflation.

Comments by contractors who said economic conditions are not a factor are:

1. Contractors 1, 6, and 17 say everyone handles inflation

pretty much the same way so this is not a determining factor in who wins the bid.

2. Contractors 4 and 5 have firm-fixed-price contracts with their subcontractors and they expect the subcontractors to account for inflation if necessary.

3. Contractors 8 and 14 bid on jobs with construction periods less than one year so inflation is not a factor.

4. Contractor 15 can usually get suppliers and subcontractors to commit to their prices for the duration of the project.

3.8 Labor Environment: Own Labor Force

Ten contractors stated that their own labor force was a factor in their bidding strategies. Comments by these contractors are:

1. Contractor 1 will bid a job more aggressively if he needs the work to protect his superintendents and foremen (some of these are stockholders in the company).

2. Contractors 3, 7, and 8 lower their fee and overhead to win a bid if they need the job to keep their supervisors working.

3. Contractor 5 has determined that the productivity of his people varies with the geographical area and he accounts for these differences when estimating the time to complete a task. He also accounts for the geographical variation in wage rates.

4. Contractor 6 accounts for higher insurance costs in jobs that are more labor intensive.

5. Contractor 10 lowers his fee and bids on more jobs if he needs the work to keep his supervisors (including some foremen)

employed.

6. Contractor 13 might bid a job more aggressively (lower unit prices) if he needed the work to keep supervisors employed.

7. When he needs a job to keep superintendents and foremen working, Contractor 15 reduces the bottom line rather than reducing any particular bid items.

8. Contractor 17 reduces his fee and assumes a higher productivity factor in his estimate if he needs a job to keep key people employed.

Contractors 4 and 14, who said they do not consider their own labor force in their bidding strategies, relocate key people to other job sites to keep them working.

3.9 Labor Environment: Additional Hires

Five contractors said that the additional direct hires they will need to perform a particular job if they win the bid is a factor in their bidding strategies. Their comments are:

1. Contractor 5 gives the same considerations to geographical productivity and wage rate variations for additional hires that he gives for his current employees (as discussed above).

2. Contractor 9 tries to determine that the local area has ample common labor available before he submits a bid.

3. When there is a shortage of qualified workers in an area, Contractors 13 and 14 increase wages to attract good workers.

4. When he is considering bidding on a job, Contractor 16 does a survey of local wages for use in estimating. If he must pay

inflated wages to get the people he needs and he thinks this will result in him struggling to make a profit he will not bid.

3.10 Labor Environment: Labor Unions

Six contractors said labor unions play a role in their bidding strategies. Their comments are:

1. Contractor 5 does not bid on jobs in heavily unionized areas. He cited higher costs and troublesome union activity as the reasons. If an area is not heavily unionized and he can pay the union wages without paying the union benefits he will bid on jobs in that area if work is not plentiful in nonunion areas.

2. Contractor 8 avoids bidding in areas where unions are very strong because of lower productivity and higher costs. When he bids on jobs in unionized areas, he makes sure the subcontractors he uses are unionized.

3. Contractor 9 does not bid in unionized areas.

4. Contractor 10 is a union contractor. Even when he bids on work in areas with weak unions he must consider the national force of the unions. His treatment of the unions in one area could lead to union problems in other areas of the country. By an agreement he has with the unions, the unions must beat the open shop price or Contractor 10 can use open shop labor. In some cases the unions have stipulated that an open shop subcontractor must use a certain percentage of union workers in his labor force. This stipulation tends to discourage open shop subcontractors from participating in such jobs because the union workers often intentionally slow

progress to reduce the profitability of the job to the subcontractor.

5. Contractor 15 is an open shop contractor. He does not necessarily avoid jobs in strong union areas but he does stay away from areas where unions cause trouble.

6. Contractor 16 avoids bidding on jobs in strong union areas.

3.11 Subcontractors

Fourteen of the contractors stated that subcontractors are a factor in their bidding strategies. Their comments are:

1. Contractor 2 selects the subcontractors that he wants to receive bids from when he is negotiating for work and takes open bids from subcontractors when he is bidding on a job.

2. Contractor 3 subcontracts seventy to eighty percent of his work. In areas that he has regular subcontractors he said subcontractors are not a factor in his bidding strategy. In areas where he does not have regular subcontractors, he deals with this factor on a case-by-case basis.

3. Contractor 4 negotiates for most of his work. He said that owners who negotiate to get their work done typically are more concerned about getting a quality job than getting a low cost job. These owners are counting on the general contractor to hire qualified subcontractors who will do a good job, which is what Contractor 4 tries to do. Even when he considers bidding on competitively bid jobs, he will not use a low ball subcontractor to reduce his bid even though he realizes that his competitors may.

4. Contractor 5 will only use bondable, reputable subcontractors that he has worked with before.

5. Contractor 6 said that he has to use the lowest subcontractor bid on competitively bid jobs because he knows the other general contractors will. He may increase his bottom line to account for the risk he is taking that the low bid subcontractor may cause problems.

6. Contractor 8 uses subcontractors that he knows are good when he is bidding on invited bidders list jobs. He uses the lowest bidding subcontractor on open bid jobs.

7. Contractor 9 tries to ensure that he has known, reliable subcontractors providing him with estimates.

8. Contractor 10 tries to use subcontractors that have done good work for him previously. If he really needs the work he will use a low ball subcontractor's bid (he sometimes inflates it to account for possible change orders) to prepare his estimate for the bid but will try to get a better subcontractor to do the work at or near the low estimate. If he can not get a good subcontractor to do the work at the lower price and he is very skeptical of the low ball subcontractor's ability to do the work, he will perform that portion of the job with his own labor force.

9. Contractor 12 has about three subcontractors in each trade that he works with regularly and he generally lets all three give him a bid and uses the lowest bidder.

10. Contractor 13 said there are plenty of subcontractors available, the problem is getting good quality. He gets a lot of

unsolicited bids from subcontractors and when he gets a low ball bid he must decide whether or not to use that bid in developing his bid on the job. Generally, he splits the difference between the low ball estimate and the other bids that are usually grouped fairly close together and takes the chance that he may have to use a higher bidding subcontractor if the low ball subcontractor fails to show up on the job.

11. Contractor 14 invites particular subcontractors to give him bids for work that he is negotiating with the owner. When he bids on public work, where the lowest bidder usually wins, he takes a chance and uses the subcontractor who offers the lowest bid.

12. Contractor 15 said subcontractors are the number one consideration in his bidding strategy. He uses regular subcontractors when he can. He anticipates getting lower bids from good subcontractors when they are hungry for work but he will not use a low ball subcontractor.

13. For Contractor 16, the availability of quality subcontractors is a factor when he is deciding whether to bid a job, but not when he is deciding how much to bid.

14. Contractor 17 selects the subcontractor with the lowest bid from among those he feels can do the work. Contractor 17 will not bid on a job if he has to risk working with a low ball subcontractor to win the bid.

Contractor 1, who said that subcontractors are not a factor in his bidding strategy, said that he has regular subcontractors in most areas that he works and he has good relationships with

them.

3.12 Equipment and Operators

Only two contractors stated that they consider equipment and equipment operators when making bidding strategy decisions. Their comments are:

1. Contractor 4 pays particularly close attention to getting good subcontractors for his equipment needs.

2. In remote areas or areas that have had little recent construction, Contractor 10 adjusts his equipment and operator costs to account for anticipated lower productivity.

3.13 Cash Flow

Twelve contractors consider cash flow to be a factor in their bidding strategies. Their comments are:

1. Contractors 1, 6, 16, and 17 sometimes bid a job more aggressively if they expect the cash flow on that job to be good and sometimes avoid bidding on a job that they expect will have poor cash flow. Contractor 1 does not have to finance jobs because he has enough retained earnings to cover costs until he receives payment. However, he includes a higher fee for jobs with poorer cash flow to compensate for lost opportunity costs of money that is used to cover costs on a job when it could be invested elsewhere. Contractor 17 includes the cost of financing in his bid on a job that requires financing.

2. Contractor 3 may not bid on a job if he doubts that the

owner is able to pay on time.

3. Contractors 5, 12, and 13 include costs of financing jobs in their overhead. A job must generate at least a set minimum amount of dollars per month for Contractor 5 to bid. Contractor 12 says he only includes finance costs in situations such as the owner paying within 45 or 60 days of receiving his bill and his subcontractors requiring payment within 30 days of their bill submittal.

4. Contractor 8 tries to get jobs with good cash flow and tries to avoid jobs with low cash flow but to stay competitive he does not include the cost of financing in his bids.

5. Contractor 10 says cash flow is very important to him. He particularly likes doing work for the Army Corps of Engineers because they have gone to zero percent retainage and provide money up front for mobilization. He might avoid bidding on a job because of poor cash flow but he would not bid on a job more aggressively because of good cash flow. He sometimes adds the interest cost on loans to his bid when cash flow is low and he must finance the job.

6. Contractor 14 recognizes that payment on public jobs is consistently on time and sometimes bids those jobs a little lower for that reason.

7. If Contractor 15 is concerned about an owner's ability or intention to pay for the work, he will ask the owner to provide a set-aside letter from his lender. The set-aside letter must state that financing has been approved for the job. The contractor then submits his bills directly to the lender who has independent

inspectors verify the work is completed as billed. Contractor 15 has never had a problem with getting an owner to provide a set-aside letter.

3.14 Overhead

Six contractors said overhead is a consideration in their bidding strategies. Their comments are:

1. Contractor 4 may reduce his fee to win a bid if he needs the work to cover his overhead.

2. Contractor 5 does not bid on a job if he can not include the proportionate amount of his overhead and remain competitive.

3. Contractor 8 reduces his fee and overhead estimates in a bid to be more competitive if he needs the work to cover his overhead.

4. Contractor 11 reduces his beginning negotiating position by reducing the fee and overhead in his estimate when he needs work to cover his overhead. He also shops around for better prices from suppliers and subcontractors and may ask them to give him special consideration by lowering their prices so he can get the work.

5. After Contractor 13 has covered his overhead for the year, he does not include overhead in subsequent bids.

6. Contractor 17 bids more jobs but does not reduce his estimates when he needs work to cover his overhead.

Contractor 6, who said overhead is not a consideration in his bidding strategy, would reduce his home office staff if he was having trouble covering his overhead costs.

3.15 Other Considerations

Eight contractors said there are other factors under the heading of "market conditions" they consider in bidding strategy decisions. Their comments are:

1. Contractors 1 and 10 bid aggressively to maintain their respective market shares in the types of work that they consider to be their bread and butter. Contractor 1 says he is the preeminent contractor in Georgia in a particular type of construction and he bids that type of work very aggressively to maintain his market share.

2. Contractor 5 considers the geographical variations in the economy. He does not bid on jobs in geographical areas where the economy is depressed and there are likely to be some very hungry contractors bidding.

3. Contractor 8 said the bidding structure plays a role in his bidding strategy. He said that when the job is negotiated, the owner is depending on the general contractor to provide a quality job and the general contractor has the money he needs to hire the best subcontractors. When the contract is awarded based on bids from an invited bidders list, Contractor 8 knows who his competitors are and that they all generally use similar bidding strategies so there will not be any low ball bids. In this case he uses subcontractors that he knows will do good work and who give him a competitively priced bids. On jobs that are open to all bidders, he usually uses the subcontractor with the lowest bid. Additionally, Contractor 8 may avoid bidding on a job that he

thinks will be too difficult.

4. Contractor 15 considers the personality of the owner. If he thinks the owner will be difficult to work with or is dishonest he may not bid on that job.

5. Contractor 16 may reduce his fee on a job to expand into, or enhance his experience in, a particular type of work.

6. Contractor 17 considers the owner's financial status. If he doubts the owner's ability to pay for the work he will not bid on the job.

3.16 Gaging Market Conditions

Fifteen of the contractors said they have some method of determining the market conditions. The resources they use to determine the market conditions are as follows (how far into the future that projected market conditions will be a factor when preparing a bid is indicated in parenthesis):

1. Contractor 1 determines who his competition is from the selected bidders lists. He does not use the *Dodge Report* because he says it is outdated before it is printed. (At least one year)

2. Contractor 2 has three people in his marketing group who talk to owners, real estate brokers, subcontractors, and architects to determine what work will be available in the future. (None)

3. Contractor 3 has a marketing department that reviews the *Dodge Report* and *Construction Market Data* (an Atlanta area publication) and talks to architects, owners, and suppliers to determine market conditions. (From one to two years)

4. Contractor 4 asks the owner who the competition is before he decides whether to bid on a job. (One year)

5. Contractor 5 uses the *Dodge Report* and *Construction Market Data*. (Varies)

6. Contractor 6 uses his suppliers and subcontractors as his primary sources of market information. (None)

7. Contractor 7 uses the *Dodge Report* and *Construction Market Data*. The number of subcontractors calling to offer bids and the number of owners calling to discuss negotiated work are also indicators of market conditions. (None)

8. Contractor 8 uses the *Dodge Report* and *Construction Market Data*. The number of bids from, and the unit prices used by (lower unit prices means less work is available), subcontractors are good indicators of the market. (None)

9. Contractor 9 uses the select or invited bidders list to determine market conditions. (Until the scheduled end of that job)

10. Contractor 10 has a business development group that uses the *Dodge Report* and talks to owners to determine what their long range needs are and who the competition will be. (One to two years)

11. Contractor 11 gets his information from owners and real estate brokers. (One year)

12. Contractor 14 has a vice president for marketing who uses the *Dodge Report* and *Construction Market Data* to help determine market conditions. (About six months)

13. Contractor 15 uses the *Dodge Report* and *Construction Market Data* and talks to owners, competitors, and suppliers. (About

one year)

14. Contractor 16 uses the *Dodge Report* and *Construction Market Data* and talks to subcontractors, suppliers, and architects. He said that when architects do not have a lot of work that probably indicates a construction business bust period is coming soon. (Until the scheduled end of that job)

15. Contractor 17 uses the *Dodge Report* and *Construction Market Data* and talks to subcontractors and suppliers. (None)

CHAPTER 4

CONCLUSIONS AND FUTURE RESEARCH

4.1 Conclusions

For several reasons, it is very difficult to draw conclusions or make generalizations from the information collected. First, there is very little pattern to the responses of the contractors. Second, the author suspects that if any of the contractors reviewed the responses of the other contractors, that contractor would recognize other bidding strategy variations that he uses that did not occur to him at the time of his interview. Third, a response by a contractor that stated he does not take a particular factor into consideration in making his bidding strategy decisions may mean that he would never take that factor into consideration or simply that he has not previously but might under different market conditions.

In other words, using the data in Table 1 to compute the percentage of contractors who consider each market-condition factor may not give a true reading of Atlanta area contractors. Certainly, it is reasonable to make generalizations such as (a) the competition for a job is a factor for most contractors and (b) the amount of work available on a seasonal basis is a factor for few contractors. However, even where the contractors were nearly unanimous that a factor plays a role in their bidding strategies, there was usually wide variation in how they change their bidding

strategies based on that factor.

The author is skeptical of the value of any generalizations that one might try to make from this information. The contractors' bidding strategies are as varied as the individuals involved in developing those strategies and the market-place experiences of the companies.

The value of this paper lies primarily in the insight that Chapter 3 offers into the wide range of ways that contractors vary their bidding strategies based on market conditions. A general contractor might use this information to evaluate his bidding strategy and perhaps make some adjustments. For example, Contractor 3, who said he may not bid on a job if he doubts that the owner is able to pay, might benefit from using the set-aside letter described by Contractor 15. By doing so, he could increase his opportunities for work because he would not eliminate potential sources of work (i.e., owners who appear to be on shaky financial ground) and he could turn a potentially risky venture into a very secure one because he could have a virtual guarantee up front that he would be paid for his work.

4.2 Future Research

One possible approach to future research is to expand the survey to a national level. Although a few of the companies surveyed for this paper do work nationally, most of them work only in the Southeastern United States and there may be regional differences in market-condition related bidding strategy decisions

that were not reflected here.

Another approach is to determine if contractors vary their management of jobs to coincide with the variation of their bidding strategies. For example, some contractors obtain most of their work through negotiation but bid on jobs if there is not enough negotiated work available. These contractors may reduce their estimates (compared to what they would use if they were negotiating) to be competitive on the jobs they bid. Do they manage these jobs the same way that they manage the jobs they obtain by negotiation?

REFERENCES

- [Boughton 87] Boughton, P., "The Competitive Bidding Process: Beyond Probability Models," *Industrial Marketing Management*, Vol. 16, Number 2, pp. 87-94
- [Ahmad 88] Ahmad, I. and I. Minkarah, "Questionnaire Survey on Bidding in Construction," *Journal of Management in Engineering*, Vol. 4, Number 3, pp. 229-243
- [Tavakoli 89] Tavakoli, A. and J. Otomo, "Bid Markup Assistant: An Expert System," *Cost Engineering*, Vol. 31, Number 6, pp. 28-33
- [Berger 77] Berger, S. and J. Godel, *Estimating and Project Management for Small Construction Firms*, Van Nostrand Reinhold Co. Publishers, 1977
- [ENR 84] "Yonkers Contracting on a Winning Streak," *Engineering News-Record*, Vol. 212, pp. 26-27

APPENDIX

CONTRACTOR INTERVIEW FORM

Date:

Contractor:

Address:

Telephone:

Point of contact:

Introduction: Who I am; what I am doing and why; strictly anonymous; stress research focuses on market conditions

1. Gross revenue for 1989 (1988 if latest available)

2. Determine contractor's fundamental bidding strategy and any tools used for making bid strategy decisions (e.g., quantitative analysis, expert system, bidding strategy model)

A. Adaptive: bid low and often, markup based on recent success or failure in winning bids and current workload

B. Quantitative: markup based on number of competitors, size of bid, competitors' past bidding performance, trying to maximize profit while keeping in mind that competitors may under bid you

C. Strategic: bid based on value of job to company, value based on company's goals such as expanding market share in a particular geographical area or particular type of construction

3. What factors considered in market conditions and how does contractor vary bidding strategies due to each or combination of two or more? (Possible variations include overhead, profit, contingencies, less subcontracting; more selective in type jobs bid, owner involved, location, type contract (competitive bid vs. negotiated); seek jobs with higher risks, fewer competitors;

diversify to respond to market changes, competition changes, clients needs)

A. A lot or a little work available

1) Seasonal

2) One or several years boom or bust

B. A lot or a little competition

C. Economic conditions (e.g., inflation, taxes)

D. Labor environment

1) Own labor force working or idle

2) Additional work force: quantity and quality

3) Strong union area or not

E. Subcontractor market: quantity and quality

F. Equipment and operators: quantity and quality

G. Low cash flow

H. Must cover overhead

I. Others

4. How does contractor determine market conditions: Dodge lists contractors bidding on a job, suppliers, bankers

5. How far in the future does contractor look when making a bid on a current job?

6. Remarks:

Date

Mr. John Doe
XYZ Construction Company
Any Street
Atlanta, Georgia 12345

Dear Sir:

Per our telephone conversation today, I have enclosed a copy of the survey form I have been using to collect information from local general construction contractors about how they vary their bidding strategies depending on market conditions. My report will not identify companies or individuals. I will use this information to write a research paper for my Master of Science Degree in Civil Engineering from Georgia Tech. I have enclosed a return envelope.

Your responses to numbers 1 and 2 will help me categorize your other responses with similar companies. For number 2, please indicate which of the three fundamental bidding strategies (A,B,C) your company follows. If your company uses a mixture of these or is better classified some other way, please indicate this. Please indicate what, if any, tools your company uses to make bidding strategy decisions (e.g., whether or not to bid, how much to mark up).

For number 3, please indicate for each factor or subfactor whether you consider it in your bidding decisions and if you do, how you might vary your bidding strategy for that factor or subfactor. To give you an idea of the types of variations I am referring to, I have listed some examples.

Short answers that provide detail but fit within the space provided should give me the information I need without requiring a lot of writing on your part. If you have any questions, or if after seeing the questions you decide it would be more convenient for you to answer over the telephone, please call me at 881-8770.

Thank you for your time and assistance.

Sincerely,

Ron Barr