ECONOMIC DISPARITY BETWEEN DBE[1] AND NON-DBE CONTRACTORS IN COMPETITION FOR GOVERNMENT CONTRACTS

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ABSTRACT

Is the disparity between DBEs and non-DBEs reduced once a DBE is utilized by an agency? Presently, disparity studies are used to establish goals for race and sex preference procurement programs by calculating the ratio of available:utilized DBEs. The agency then sets the goal to achieve maximum utilization. However, little assistance is provided to the DBEs once they are utilized by the agency. This study examines the disparity between DBEs and non-DBEs who are in competition for an agency's contracts, and this study found that non-DBEs have four distinctive competitive advantages when competing with utilized DBEs and found that DBEs do enjoy some degree of competitive parity with non-DBEs.

INTRODUCTION

This study asks whether the disparity between DBEs and non-DBEs is reduced once a government agency utilizes the DBEs. DBE procurement programs[2] have been controversial since their inception, and numerous court cases[3] have challenged their viability. The bellwether case is the *Croson* decision (1) (2) (3) (4) that declared the City of Richmond's minority business program unconstitutional.

> In *City of Richmond v. J.A. Croson Co.*, 109 S. Ct. 706 (1989), the Supreme Court inflicted another, perhaps lethal, blow to state and municipal set-aside programs that contain race-conscious remedies or racial preferences. (5).

As a result of the *Croson* decision, state and local governments needed to support their DBE participation policy with a disparity study to establish whether a significant disparity existed between the number of available DBEs and the number of DBEs utilized by state or local government to meet its procurement needs. Disparity studies also determined whether DBEs are limited in their ability to do business with a governmental agency. Based on the disparity study, a DBE participation policy could then be established by the agency to correct the disparity.

This study asks whether disparity is also reduced once DBEs are utilized by an agency? Does success in government contracting automatically put DBEs in parity with non-DBEs? Does a race-preference procurement program create a pool of DBEs who realize the same competitive advantages as enjoyed by the non-DBEs? This study uses five economic factors to explain the disparity in performance between DBEs and non-DBEs in competition for government contracts. The economic factors measure the disparity between the merits of the contractors' respective bids in order to measure competitiveness between DBEs and non-DBEs.

LITERATURE REVIEW

This study applies to the study of race and sex preference purchasing policies and the disparity studies prolongated as the result of the *Croson* case, and applies to the study of the competitive environments encountered by DBEs.

Disparity studies answer important questions asked in the *Croson* case. Disparity studies determine whether race-conscious remedies are constitutionally permissible by showing that the remedies are based on evidence that discrimination caused a significant underutilization of minority businesses. Several disparity studies found a statistical disparity between the utilization and availability of DBEs. The Massachusetts Water Resources Authority study (6) found " . . . evidence of pervasive and ongoing discrimination against minorities and women and businesses owned by minorities and women in the geographic market and industries from which MWRA procures goods and services." The Dade County Public School Disparity Study (7) found " . . . significant disparity between the availability of minority firms in the relevant market and their utilization by DCPS gives rise to an inference of discrimination." The City of New York study (8) found that "M/WBEs received a substantially smaller share of the dollars spent . . . than we would expect given the availability of M/WBEs in the geographic market and industries from which the City procures goods and services." The Cook County study (9) found " . . . substantial evidence of

pervasive, historical discrimination against M/WBEs in the Chicago area economy . . . These barriers have contributed substantially to the historical underutilization of M/WBEs by the County."

Even though these studies found disparity in the utilization of DBEs, DBE programs are still controversial. The heart of the controversy is succinctly stated in a current suit over the City of Chicago DBE goals.

> *"The City has established a program setting quotas (*Getzendanner, 1990*) (10) for work reserved for MBE/WBEs through a system of mandatory subcontracting obligations, rather than establishing a program whereby qualified MBE/WBEs and non-minority contractors compete on the merits of the respective bids. The race, ethnicity and gender of an individual bears no rational relationship to an individual's willingness, qualification and ability to engage in construction contracting with the City."* (11)

Are "mandatory subcontracting obligations" the principal way to decrease the disparity between DBE and non-DBE firms versus establishing a program whereby qualified MBE/WBEs and non-DBE contractors compete on the merits of their respective bids. This study examines DBEs' ability to compete on the merits of their respective bids in competition for government contracts.

Several studies have critically compared DBE and non-DBE firms to answer the question of how these firms differ when examined within the competition context of government bidding and contracting in the private sector. These studies analyze the competitive differences between DBEs and non-DBEs to understand how various organizational and competitive factors impact the competitive circumstances encountered by DBEs. The objective of these studies is to explain why the playing field is not level for DBEs and to find a policy where DBEs become an equal competitor for government contracts as well as contracts in the private-sector.

In 1982, Thomas G. Black (12) reported that selling to the government can become a traumatic experience which could result in financial loses, because government contracting laws and regulations are a complex maze from which small businesses are not exempt. Black said, "Ignorance is not bliss when it comes to contracting with the federal government. Failure to stay informed can prove to be legally and financially disastrous." In 1989, Cantor (13) (14) surveyed small business to identify the perceived barriers of small business owners to participation in the government market. He reported the following:

> " ... problems encountered in securing and completing federal work are different from those encountered when doing private sector work. Regardless of the size of the firm, businesses reported that doing work for the federal government was more costly than doing work for the private sector due to (1) higher costs in making proposals, (2) higher costs of producing goods and services, and (3) less profitability from revenues."

Davis (15) studied the effect of legislation on DBEs' ability to secure new or additional government contracts or subcontracts, and he found that the set-aside provision of the Small Business Act legislation had significantly helped DBEs secure new or additional government contracts, but he found some weakness or dissatisfaction with other laws and their implementation. Enz, Dollinger, and Daily (1990) studied the value orientations of DBE firms and found that DBE owners placed greater emphasis on six value orientations: collectivism, rationality, materialism, duty, novelty, and power. The GAO (16) found that competition for DOT-assisted contracts have been concentrated in a few specialty areas that require relatively little capitalization. Non-DBEs complained that they are denied contracting opportunities in the few specialty areas because of the number of DBEs obtaining subcontracts for the specialty work. Conversely, DBEs express concern that it is difficult for them to expand and diversify. Dollinger, Enz, and Daily (17) used a transaction costs framework to analyze race and sex preference purchasing programs. They examined the buyer-supplier stalemate where DBEs perceive and experience barriers that hamper contracting opportunities, and corporate purchasers recognize the barrier, but do not treat the barriers seriously. They recommended companies should shift transaction costs away from purchasing personnel to specialists, and companies should adopt multiple criteria for evaluating DBE programs as well as experiment with innovative programs to maximize purchaser's and DBE resources. Scott (18) compared the financial performance of mature and financially viable DBE and non-DBE firms and found that DBE firms had virtually the same financial performance in terms of profitability, indebtness, and liquidity as non-DBEs. Bates and Furino (19) matched pools of similar DBEs and non-DBEs to determine the viability of minority firms in non-traditional lines of business. Their study found that DBEs in fields other than retailing earned higher returns on business net worth than non-DBEs, that DBEs were in a high leverage position and therefore exposed to greater vulnerability to business fluctuation, and that DBEs' net worth and liquidity are the most predictive variables in distinguishing profitable from unprofitable DBEs. Giunipero (20) studied DBEs performance from the purchasing agent's perspective, and found that purchasers perceived greater problems when contracting from DBEs as compared to non-DBEs. In particular, purchasers had

problems in locating DBEs and identifying DBEs with the necessary technical, management, and marketing skills. Pearson, Fawcett, and Coopers (21) examined the impediments and approaches to buyer/supplier relationships between Fortune 500 firms that have corporate minority purchasing programs and their DBE suppliers, and they found that corporate purchasers and DBEs are slowly reducing the barriers to successful contracting relationships. Dimeo (22) also performed a notable study of DBE contracting.

RESEARCH METHODOLOGY

This study uses five economic factors of competition to explain the difference between DBEs and non-DBEs in competition for government contracts. The government agency under study is the Chicago Transit Authority[4], and its annual-order contracts issued from 1981 to 1992. Logit analysis is the statistical method used to develop a multivariate regression model.

Sample Selection

The sample of annual-order contracts is drawn from the population of overmoney[5], annual-order contracts[6]. The principal criterion for selecting the sample is the contracts' commodity, because the sample must account for the variations that exist among different commodities and/or industries in order to be an effective overall measure of the agency's purchasing situation[7]. The sample is shown in TABLE I and shows that the sample fairly represents the array of commodities and dollar values of contracts issued by the agency.

TABLE I shows that an average of 209 annual-order contracts was competitively bid annually, and these contracts represent 9 different commodities purchased by the agency. The final sample used for this analysis includes 166 different annual-orders and 800 contracting events. This sample represents approximately 20% of all competitively bid[8] annual-order contracts issued by the agency during the ten-year period under study[9]. The sample was further reduced to compare DBEs and non-DBEs on a similar basis. The pools of DBEs and non-DBEs are selected based on their competition for similar-size contracts in order to evaluate the difference in the economics factors that can explain the difference between these two pools of successful firms. TABLE II shows that both DBEs & non-DBEs are competing for contracts of similar value.

Research Design: A Multiple Regression Policy Model

A multivariate logit regression model is the principal method used to explain the disparity between change in DBEs versus change in non-DBEs who are in competition for an agency's contracts. The model uses five economic factors to describe the circumstances under which firms tend to win and to lose contracts.

The response variable, change in contractor, is binary due to the phenomenon being measured. In government contracting, there are only two mutually exclusive possible outcomes from every competitive bid event: the incumbent contractor wins the consecutive annual-order contract or the incumbent contractor does not win the award of the consecutive annual-order contract. The binary outcome creates two mutually exclusive events and permits inferences regarding not only the incumbent contractor, but also inferences regarding the challenging firm. TABLE III shows the multivariate logit model. I call this model the *policy model*, because it measures whether the public good is being sought by the agency through its effort to seek low-cost goods and services. The foundation for the *policy model* is change. Change in contractor, the response variable, is measured simultaneously with change in all the explanatory variables.

Variable Definition

This section defines the response variable and the 13 explanatory variables used to measure the *policy model*'s five economic factors. TABLE IV states the hypothesized relationship between the explanatory variables and the response variable.

The response variable is change in contractor. The unit of measure is the firm, and a dummy variable is created to identify whether the same firm or a different firm wins the annual-order contract. The response variable is intended to measure two different winning events: (a) the incumbent contractor wins a consecutive annual-order contract, or (b) a challenging firm wins the annual-order contract. The logit analysis models the response variable to explain the probability that the incumbent wins a consecutive annual-order contract, i.e., Pr(WIN=0). The probability of the other event, the challenging firm wins the annual-order contract, is found by a simple calculation in accordance with probability theory for two mutually exclusive events, i.e., Pr(WIN=1) = 1 - Pr(WIN=0).

The policy model uses five economic factors to explain change in contractor:

Financial factors. Two financial variables are used as a measure of the financial factor of the contracting event: annual sales to the agency during the year of contract award and the authorized contract expenditure. Both financial variables are measured in actual dollars during the year of contract award and are not adjusted for inflation.

Low-bid position factor. Two variables are used to measure whether the successful contractor was also the low bidder: low-bidder and percentage-low-bidder. The low-bidder variable measures whether the successful contractor was also the one who submitted the lowest-overall bid price or whether the contractor submitted a price higher than the lowest-overall bidder but, due to the evaluation of non-price factors, won the contract anyway. The percentage difference between the successful bidder and the next lowest bidder measures the actual percentage difference between the two bidders.

Price and CPI change factor. This factor measures price change between consecutive annual-order contracts in order to determine the degree of price competition for the agency's contracts. Three variables are used to measure price change: actual and absolute value of the price change between consecutive annual-order contracts and change in the consumer price index.

Competition factor. This study uses three variables to count the actual number of firms interested in doing business with the agency, and each variable represents a different level interest on the part of the firm. The three levels of measurement are the number of firms solicited, the number of firms responding to the bid solicitation, and the number of firms submitting a bid price.

Firm's pricing tactics factor. The fifth economic factor used to explain change in contractor is pricing tactics. The three pricing tactics used to measure this factor are the firm's offer of a fixed or escalated price, the firm's offer of some payment terms for early payment of an invoice, and the firm's offer of a percent discount for early payment of an invoice.

EMPIRICAL FINDINGS

Response Variable

The sample is balanced between incumbent and challenger for non-DBEs and is imbalanced for DBEs. This finding shows that non-DBEs have an equal chance of winning a contract as an incumbent or a challenger whereas a DBE has a better chance of winning a contract as a challenger. This finding indicates that the agency's DBE policy is successful in reducing the barriers to the government market for DBEs and thereby reducing the disparity as defined by the *Croson* case. However, the agency's DBE policy does not decrease the disparity between the DBEs and non-DBEs who are in competition for the agency's contracts. This finding is consistent with the agency's DBE policy, because its policy does not contain any provision for providing management assistance to DBEs after its first contract award.

Explanatory variables

TABLES V and VI present the univariate description of the explanatory variables used for DBEs and non-DBEs, respectively. The univariate analysis revealed two unexpected findings. First, DBEs who compete for same-sized contracts have significantly greater sales ($V7_{DBE}$=\$187,000 vs. $V7_{non\text{-}DBE}$=\$31,000) to the agency than non-DBEs, and DBE's ratio of sales/contract expenditure (V7/V28) is significantly greater ($V7/V28_{DBE}$=2.15 vs. $V7/V28_{non\text{-}DBE}$=0.49). This finding indicates that successful DBEs win more than one contract whereas successful non-DBE firms were more likely to win only one annual-order contract, and DBEs are more successful at maximizing sales in proportion with contract value. Second, DBE firms are more likely to win as the lowest overall bidder and non-DBEs are more likely to win as other-than-low-bidder ($V9_{DBE}$=0.52 vs. $V9_{non\text{-}DBE}$=.89) . However, DBEs realize a price increase where non-DBEs average a decrease in the consecutive contract price ($V24_{DBE}$=+1.75% vs. $V24_{non\text{-}DBE}$=-0.99%). In addition, the contract price variance shows that successful non-DBE firms vary greater (-92% to +82%) than DBE firms (-41% to 55%). This finding suggests that the non-DBEs have greater product and market knowledge to know when they have a competitive edge in product quality or pricing to win the contract, and non-DBEs use that competitive edge to win contracts as incumbents while maximizing profits. In some cases non-DBEs will drastically cut prices in order to win the subsequent annual-order. Whereas DBEs were more conservative in their pricing strategy. One explanation for non-DBEs' ability to vary their pricing more than DBEs is that non-DBEs faced slightly less competition than DBEs.

Logit Analysis Findings

Power of the incumbent is confirmed by these findings. Four of the five findings are consistent with the hypothesized relationship that incumbent firms have a significant advantage when competing for government contracts. The fifth significant finding showed that incumbent non-DBEs won contracts when the change in contract price increased from one year to the next

year. Even though this finding is not as hypothesized, it does indicate the incumbent's economic power to win contracts at higher prices.

Power of the incumbent also explains why non-DBEs, who have traditionally dominated the government market, may continue to remain successful in government contracting in spite of race and sex preference government contracts. This study finds that non-DBEs have a competitive advantage because all the five economic factors used to measure competition for government contracts explained the success of incumbent non-DBEs. Non-DBEs' competitive edge over DBEs in competition for the same-size contracts is summarized as follows:

Non-DBEs realize a competitive advantage with an increase in annual sales to the agency. This is an unexpected finding, because non-DBEs' sales to the agency is significantly less than DBEs' sales. DBEs' annual sales to the agency greatly exceed the annual sales of non-DBEs, and it is expected that the firm with the greater sales to the agency would have the economic power to be more successful in winning contracts. However the opposite is found. The pool of firms with significantly less sales are more effective in winning contracts. This finding suggest that non-DBEs concentrate their economic influence over one or two selected contracts, rather than dispersing their effort over a broad range of contracts.

Non-DBEs win contracts by offering firm prices for the duration of the contract. A substantive part of every price proposal is whether the bidder is offering a firm price or escalated price for the duration of the contract. A firm offering a superior product at the lowest overall price can lose the bid if its price is subject to escalation. Non-DBEs' capability of proposing a firm price for the duration of the contract is a clear competitive advantage.

Non-DBEs probability of winning a consecutive annual-order contract increases as the change in contract price increases. This relationship is not as hypothesized, but it indicates a competitive edge enjoyed by non-DBEs who apparently have the market knowledge of how to price their product so as to win contracts at higher prices in a competitive market.

The agency solicited bids from fewer firms, producing less competitive, for contracts which have a non-DBE contractor. The agency's decision to seek less competition suggests that incumbent non-DBEs enjoyed a proprietary position when bidding for the consecutive annual-order contracts. Apparently, the agency did not see the need to maximize competition when a non-DBE was the incumbent contractor.

Three economic factors explain DBEs' success and indicate that DBEs have attained some competitive parity in competition with non-DBEs for government contracts. DBEs who enter the competitive arena due to the agency's race and sex preference purchasing program compete for contracts using three economic factors.

DBEs significantly underbid the next lowest bidder. The probability that a DBE incumbent wins a consecutive annual-order contract increases as the price difference between the incumbent's price and the next lowest price increases. Apparently, the incumbent DBE feels the market pressure and competes on price by significantly lowering its price. This strategy enables the DBE to win the consecutive annual-order contract and remain the incumbent. However, as the incumbent, DBEs risk loss of the bid for the consecutive annual-order contract, because non-DBEs also compete using this strategy.

DBEs are more likely to win contracts under stable contract pricing. DBEs face the same price competition as non-DBEs, and the probability that an incumbent DBE or non-DBE will win a consecutive annual-order contract increases under stable contract prices. This finding suggests that all incumbents are most successful when they can use historical pricing information as a basis for estimating the optimum price for the consecutive contract year. Conversely, historical pricing information is less reliable in a volatile market.

DBEs are more likely to win a consecutive annual-order contract when fewer firms submit a bid price. The probability that DBEs and non-DBEs will win a consecutive annual-order contract increases as the competition for the particular contract decreases. DBEs are in parity with non-DBEs regarding this competitive factor.

Two Other Findings

The inflation rate does not create any competitive advantage or disadvantage for either DBEs, non-DBEs, incumbents, or challengers. The change in CPI was measured between consecutive annual-order contract, and CPI did not explain the success of either type of contractor

The dollar value of the contract did not increase competitive for the contract. There is no statistical difference between DBEs and non-DBEs winning small contracts or large contracts. as is the case with non-DBEs. Larger contracts did not attract more competition as hypothesized. Incumbent contractors experience no more or less likelihood of losing a consecutive contract than incumbents who have contracts of lesser value.

CONCLUSION

In competition for the agency's contracts, DBEs have no competitive advantages over non-DBE. However, DBEs do enjoy some degree of competitive parity with non-DBEs. Conversely, non-DBEs have four distinctive competitive advantages when competing with DBEs for government contracts.

Non-DBEs' competitive advantages are positively related with their total annual sales to the agency, with the agency's decision to seek less competition, with their ability to propose contract prices that are firm for the duration of the contract, and with their ability to win a consecutive contract at a higher price. DBEs do not enjoy any other these advantages. However DBEs do enjoy three competitive factors with non-DBEs indicating some degree of competitive parity. Both DBEs and non-DBEs are more likely to significantly underbid the next lowest bidder, to win a consecutive contract under stable service and product pricing, and face less competition. The disparity between DBEs and non-DBEs still persists in competition for government even though the agency has reduced the disparity between DBEs available:utilized ratio. Additional policies may be necessary to "level the playing field" between DBEs and non-DBEs in competition for government contracts.

ENDNOTES

1. DBE (Disadvantaged Business Enterprise) means a business that is 51% owned by individuals who are socially or economically disadvantaged and whose revenues fall below certain size thresholds set by the U.S. Small Business Administration. This definition is set forth by the Federal Transportation Administration includes women-owned businesses (WBE) and minority-owned businesses (MBE).

2. DBE procurement programs have their roots in the Small Business Act of 1963 and subsequent federal acts such as Titles VI and VII of the Civil Rights Act of 1964 and Executive Orders 11246, 11375, and 11478. DBE procurement programs hold the promise of providing equal business opportunity for all persons regardless of race, color, creed, national origin, or sex.

3. Several notable court cases include Fullilove v. Klutznick, 448 U.S. 448 (1980); Wygant v. Jackson Board of Education, 476 U.S. 267 (1986); City of Richmond v. J.A. Croson Co., 109 S. CT. 706 (1989); Metro Broadcasting Inc. V. Federal Communications Commission, 110 S.Ct. 2997 (1990); Cone v. Hillsborough County , 11th Cir. 89-3976, August 1990.

4. Chicago Transit Authority operates the second largest public transportation system in North America and serves the City of Chicago and 37 surrounding suburbs. It is a large purchaser of goods and services for bus and rail car parts, repair and maintenance services, construction, and other supplies and services normally required by any corporation with over 13,000 employees, an operating budget of over $800 million, and a capital budget of $300 million. In 1977, CTA initiated a policy to utilize disadvantaged businesses. The scope of this study examines the performance of DBE and non-DBE firms during a ten-year period from 1981 to 1992. This ten-year period includes the mayoral terms of four different mayors for the City of Chicago. CTA's policy is to maximize the contracting opportunities for minority and women-owned business in accordance with the FTA regulations and its Transit Board.

5. "Overmoney" means the contract's dollar value exceeds $5,000.

6. Annual-order contracts cover the purchase of regularly used commodity-type products and services that are needed by the agency to provide daily transit services. Annual-order contracts cover the purchase of commodity-type products such as salt, fuel, paper, filters, glass, printing, and chemicals as well as cover many basic services such as lab testing, cleaning, repair, security, rental services, and delivery services. The agency's need for these products and services is predictable and routine reflecting the routine of providing daily transit services. Annual budgets to purchase these products and services are easily established based on the previous year's usage.

7. Annual-order contracts are contract decisions best suited for the study of the agency's contract decisions over the 10-year period covered by this study, because the same commodity is purchased each year, and this commonality provides the common dominator for comparing years. The standard commodity allows us to compare the agency's contract decisions between years and across the total research period. The repetitive characteristics of annual-order contracts allows us to develop more accurate predictions regarding the influence of factors other than product related variances that effect a change in contractor.

8. The agency seeks competitive bids for the annual-order contracts on a yearly basis. Bids are solicited for contracts valued over $5,000, each year by mailing a bid solicitation package to the incumbent contractor and other interested firms in addition to publishing a public notice in the newspaper. Since the need is predictable and routine, practically no change is made in the bid solicitation from year-to-year. Generally, purchasing practice recommends that annual-order contracts not be for longer than one year, because firm, not escalated, contract prices are difficult to obtain for contracts with longer periods. However, two-year or longer requirements are made whenever the agency determines there is a pricing advantage.

9. For an in-depth discussion of all contracts executed by the agency during the study period and an in-in-depth explanation of the basis for sample selection, see my dissertation, ***Economic, Political, and Bureaucratic Factors Influencing a Public Agency's Contract Decisions.*** My dissertation identifies the commodities included in the sample and provides a detailed listing of the contracts included in the sample.

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TABLES

TABLE I: SAMPLE OF ANNUAL-ORDER CONTRACTS

Commodity	Total Contract Value ($1,000)	less than $5,000	Sole Source	Competi-tively Bid	Total number of contracts
Bus parts & service	$36,312	3	9	44	56
Rail parts & service	$ 4,092	3	6	14	23
Business Services	$ 7,111	42	15	34	91
Supply and materials	$ 3,652	19	7	48	74
Rental Contracts	$ 2,575	14	10	17	41
Non-technical: paper	$ 1,140	2	0	6	8
Non-technical: printing	$ 660	3	1	9	13
Technical: chemicals	$ 1,242	4	2	14	20
Technical: electrical	$ 1,584	10	2	23	35
TOTALS	$58,368	100	52	209	361

TABLE II: Dollar Value of Contracts Won By DBE and non-DBE Firms						
	mean	mode	minimum	maximum	range	std. dev.
DBE	$86,789	$20,000	$3,000	$1,000,000	$996,000	$139,443
non-DBE	$64,010	$20,000	$5,000	$850,000	$845,000	$91,666

TABLE III: POLICY MODEL - 5 Economic Factors that Explain Change in Contractor

$Pr(WIN=0) = B_0 + B_1FIN + B_2LOW + B_3PRICE + B_4COM + B_5TACT + U$, where

Pr(WIN=0) = Probability of an incumbent firm winning the consecutive annual-order contract;
Pr(WIN=1) = Probability of a challenging firm winning contract for an annual-order.
[Pr(WIN=1) = 1 - Pr(WIN=0)].

FIN = Financial Aspects Factor
LOW = Low-Bid Position Factor
PRICE = Price and CPI Change Factor
COM = Competition Factor
TACT = Contractor's Pricing Tactics Factor
B_0 = Intercept
B_1, B_2, B_3, B_4, B_5 = Coefficients
U = The unexplained variance.

TABLE IV: POLICY MODEL FACTORS THAT EXPLAIN CHANGE IN CONTRACTOR WITH HYPOTHESES		
EXPLANATORY VARIABLES:	RESPONSE VARIABLE[10]:	HYPOTHESIS[11]
VARIABLE NAME (Variable Number)	PROBABILITY OF THE INCUMBENT WINNING	
1. FINANCIAL ASPECTS FACTOR		
Annual Sales to the Agency (V7)	(+)	Incumbent's probability of winning increases as his/her sales increase (H:PM1) and decreases as the contract values increase (H:PM2).
Authorized Contract Expenditure (V28)	(-)	
2. LOW-BID POSITION FACTOR		
Low-Bidder (V9)	(+)	Incumbent's probability of winning increases when they submit the lowest overall bid price (H:PM3).
Percentage-Low-Bidder (V10)	(+)	Incumbent's probability of winning increases as the margin between low and second-low bidder increases (H:PM4).
3. PRICE AND CPI CHANGE FACTOR		
Contract Price Change (V24)	(-)	Incumbent's probability of winning decreases as change in contract prices, CPI, and contract price variance increase (H:PM5).
Absolute Value of Contract Price Change (V24A)	(-)	
Consumer Price Index (CPI) (V33)	(-)	
4. COMPETITION FACTOR		
Number of Firms Solicited (V11)	(-)	Incumbent's probability of winning decreases as competition increases (H:PM6).
Number of Firms Responding (V12)	(-)	
Number of Firms Bidding (V13)	(-)	
5. CONTRACTOR'S PRICING TACTICS FACTOR		
Fixed-Bid-Price (V27)	(+)	Incumbent's probability of winning increases when favorable pricing terms and conditions are offered (H:PM7A).
Terms-of-Payment (V26)	(+)	
Percent Discount for Early Payment (V52)	(+)	Incumbent's probability of winning increases as the percentage discount for early payment increases (H:PM7B).

TABLE V: DBE FIRMS: UNIVARIATE ANALYSIS OF BINARY AND CONTINUOUS VARIABLES						
VARIABLE NAME	VAR. NO.	NO. OF EVENTS	MEAN	STD. DEV.	MIN. VALUE	MAX. VALUE
Annual Sales to the Agency	V7	145	187,000	247,000	$0	1,000,000
Authorized Contract Expenditure	V28	147	86,800	139,400	3,000	1,000,000
Low or Other-Than-Low Bidder	V9*	148	.52	.50	0=OTHER-THAN- LOW BIDDER	1=LOW-BIDDER
Percent-Low-Bid	V10	139	9.1%	12.4%	0%	76%
Contract Price Change	V24	144	1.75%	13.3%	-41%	55%
Absolute Value of Percent Price Change Between Annual Order Prices	V24A	144	8.8%	10.1%	0.0%	55%
Consumer Price Index	V33	146	5.8%	2.8%	0.9%	16.2%
Number of Firms Solicited	V11	149	14.8	5.2	3	30
Number of Firms Responding	V12	149	5.9	2.5	0	14
Number of Firms Bidding	V13	149	5.0	2.3	1	14
Firm or Escalated Price	V27*	146	0.9	0.3	0=ESCALATED PRICE	1=FIRM PRICE
Discount offered for early payment	V26*	147	.69	.46	0=no discount offered	1=discount offered
% Discount for Early Payment	V52	147	1.5%	2.3%	0.0%	15.0%

TABLE VI: NON-DBE FIRMS: UNIVARIATE ANALYSIS OF BINARY AND CONTINUOUS VARIABLES						
VARIABLE NAME	VAR. NO.	NO. OF EVENTS	MEAN	STD. DEV.	MIN. VALUE	MAX. VALUE
Annual Sales to the Agency	V7	319	31,100	28,600	$0	100,000
Authorized Contract Expenditure	V28	330	64,000	92,000	5,000	850,000
Low or Other-Than-Low Bidder	V9*	319	.89	.33	0=OTHER-THAN-LOW BIDDER	1=LOW-BIDDER
Percent-Low-Bid	V10	275	12.6%	16.2%	0%	99%
Contract Price Change	V24	313	-.99%	14.6%	-92%	80%
Absolute Value of Percent Price Change Between Annual Order Prices	V24A	313	9.0%	11.5%	0.0%	92%
Consumer Price Index	V33	328	4.4%	3.0%	0.4%	15.6%
Number of Firms Solicited	V11	321	12.6	5.1	1.0	42
Number of Firms Responding	V12	321	4.6	2.2	1.0	13
Number of Firms Bidding	V13	320	3.6	2.0	0	12
Firm or Escalated Price	V27*	329	0.89	.3	0=ESCALATED PRICE	1=FIRM PRICE
Discount offered for early payment	V26*	329	0.5	.5	0=no discount offered	1=discount offered
% Discount for Early Payment	V52	329	0.9%	1.3%	0.0%	10.0%

* binary variable

TABLE VII LOGIT ANALYSIS RESULTS[12]						
VAR. #	DBE FIRMS		non-DBE FIRMS		VARIABLE DESCRIPTION AND ECONOMIC FACTOR	
	coeff.	p-value	coeff.	p-value	variable description	factor
V7	.0009	.3181	.0104	.0549	Annual sales to the agency	**FINANCIAL FACTOR**
V28	-.0013	.4949	.0021	.2150	Authorized contract expenditure	
V9	-.4577	.4218	.8231	.1921	Low or other-than-low bidder	**BID FACTOR**
V10	.0598	.0138	.0548	.0007	Percent-low-bid	
V24	.0445	.1739	.0464	.0078	Contract price change	**PRICE FACTOR**
V24A	-.0916	.0315	-.0817	.0004	Absolute value of contract price change	
V33	-.0132	.2155	-.0005	.9411	Consumer price index	
V11	.0189	.7233	-.0905	.0133	Number of firms solicited	**COMPETITION FACTOR**
V13	-.3824	.0150	-.1826	.0437	Number of firms bidding	
V27	-.7608	.3733	1.2474	.0155	Firm or escalated price	**PRICING TACTIC FACTOR**
V52	-.0253	.1421	-.0091	.4867	% discount offered for early invoice payment	