# Method for Predicting the Disadvantaged Business Enterprise Capacity of the Texas Highway Construction Industry

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A method for predicting the annual work capacity of disadvantaged business enterprises (DBE), both individually and collectively, is presented that considers variables used to predict failure of small businesses.

The Surface Transportation Assistance Act (STAA) of 1982 specified that at least 10 percent of all federal funds authorized to be appropriated under this Act shall be expended with small business concerns owned and controlled by socially and economically disadvantaged individuals as defined by the Small Business Administration. These small business firms are more commonly referred to as disadvantaged business enterprises (DBEs) and the program implemented by FHWA to fulfill STAA requirements has become known as the DBE program.

Since passage of STAA, each state has established separate DBE programs and added staff to monitor, administer, and evaluate DBE requirements. Programs have been the center of many political debates and controversies, with great pressures placed on highway departments to meet their goals while trying to prevent the creation of illegal firms, or "fronts," which are really not independent companies.

In 1987, STAA was amended to allow the 10 percent goal to be met by an accumulation of the total volume of work performed by DBE and women business enterprises (WBES). This change resulted in many highway construction firms seeking WBE certification. However, many were not approved because their owners were not deemed qualified. As a result, controversy was added to the administrative chores of state agencies. In addition, DBE contractors complained about the fairness of allowing WBEs to be included in their 10 percent goals, feeling that WBEs should have separate goals.

Each state transportation agency can set goals for the DBE program and does not have to reach the 10 percent goal if a lower goal can be justified. However, few states have been able to obtain approval for lower goals. The major difficulty for most agencies is the ability to accurately assess the true capability of minority firms in their state to perform highway construction work. A set of analytical procedures was developed that will assist the Texas State Department of Highways and Public Transportation (TSDHPT) in assessing DBE work capacity.

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## DEFINITION OF CAPACITY

The term "capacity" is used to describe the maximum amount of work per year, measured in dollars, that a group can perform at an acceptable level of quality without diminishing the future viability. This group can be an individual business firm or a collection of business firms such as found inside a governmental unit (i.e., a county, state, or highway district). Hence, the term "statewide capacity" refers to the collective capacity of designated individual firms within a state, whereas firm capacity pertains to a single business entity.

## LITERATURE REVIEW

No empirically valid solution or procedure exists for predicting the capacity of a construction firm. However, several rule-of-thumb procedures do exist. For example, the surety industry sets bonding capacity at 10 times working capital (i.e., current assets less current liabilities) or 5 times net worth. Other factors, such as company age, size, project experience, financial position, etc., affect bonding capacity as well. In another example, bidding capacity of prequalified general contractors is defined by TSDHPT as 20 times working capital adjusted for various factors. In both examples, neither empirical tests nor financial theory entered into that capacity-setting process. These limits were set by years of experience and an engineering judgment for what is correct. However, a logical and empirically verifiable thesis can be presented that construction revenue is positively correlated, in a statistical sense, with financial resources. An additional thesis is that owners, insurers, and creditors of construction projects desire that contractors have the necessary economic viability to complete these projects. In other words, construction firms should be as far from the prospects of bankruptcy as feasible in an economically cyclical industry like construction.

Empirical financial research has demonstrated that financial ratios are statistically significant and reliable predictors of financial distress from 1 to 5 years before business failure (*1–8*). This relationship holds for large publicly capitalized and traded concerns to small businesses regardless of the type of venture.

Table 1 presents the ratios investigated along with the name of the researcher. A strong amount of agreement exists among these researchers. Altman (*1*) and Ohlson (*2*) agree that liquidity, leverage, and profitability ratios are important in

TABLE 1 IMPORTANT FINANCIAL RATIOS FOR PREDICTING BANKRUPTCY

| Ratios | Altman 1968 | Beaver 1966 | Blum 1975 | Dambolena 1980 | Ohlson 1980 | Vinso 1979 |
|---|---|---|---|---|---|---|
| **Liquidity ratios:** | | | | | | |
| Working capital/Total assets (1,2) | X | | X | | X | |
| Current assets/Current liabilities (1) | | | | | X | |
| **Leverage ratios:** | | | | | | |
| Total assets/Total liabilities (1,2) | X | X | | | X | |
| Market value of equity/Book value of debt (1) | X | | | | | |
| Retained earnings / Total assets (1) | X | | | | | |
| **Profitability :** | | | | | | |
| Cash flow / Total liabilities (1,2) | | X | X | | X | |
| Earnings /Total assets (1,2,3) | X | X | | | X | |
| Net loss last 2 years | | | | | X | |
| Net income /Equity (1) | | | X | | | |
| **Other measures :** | | | | | | |
| High variability of income year-to-year | | | | | | X |
| High variability of financial ratios | X | | | X | | |
| Initial pool of funds (1,4) | | | | | | X |
| Size (1) | | | | | X | |

Notes :

(1) The lower the value the more likely the firm will become bankrupt

(2) Related measurements or concepts

(3) Earnings in this case pertains to either earnings before interest and taxes or net income

(4) The amount of long-term debt and equity it took to start the business

predicting bankruptcy. Blum (*3*) concurs with respect to liquidity and profitability, whereas Beaver (*4*) confirms the importance of leverage and profitability ratios. Dambolena (*5*) found evidence, as did Altman, that a high variability of financial ratios is a good predictor of bankruptcy. Finally, Vinso (*6*) found that high variability of income from year to year and the initial pool of funds (i.e., start-up capital) is important for predicting bankruptcy as well. If the Vinso study can be considered valid for DBEs in the highway construction industry, then this finding has ominous implications for DBEs because they are engaged in a cyclical industry (i.e., income varying from year to year depending on the economy) and many lack sufficient start-up capital. Overall, an inference can be made that unsuccessful firms are low in liquidity, highly leveraged, and unable to generate sufficient operating funds. The lack of working capital, net worth (i.e., higher net worth precludes higher leverage), and cash flow are important in the viability of a DBE.

The Edmister study (*7*) is particularly relevant to DBEs because this study concentrated on small business firms and found a relationship between undercapitalization and revenue. A net worth/revenue ratio of less than 7 percent was one indicator of future failure. The implication is that equity capital is insufficient to support revenue whenever this ratio reaches a level below 7 percent or its reciprocal becomes greater than 14 to 1.

## BASIC FORECASTING MODEL

Statewide highway capacity (in dollars) of certified DBEs can be divided into two components:

1. Amount of revenue produced annually by DBEs, and
2. Proportion of DBE annual revenue derived from state highway work.

Therefore, the basic capacity forecasting model can be expressed as

$$S_t = 0.1584 \sum_i R_{ti} \qquad i = 1, 2, \ldots, n \tag{1}$$

where $S_t$ equals the expected maximum amount in dollars contracted to DBEs in year $t$ (i.e., statewide DBE highway capacity), and $R_{ti}$ equals the annual dollar capacity of the $i$th DBE in year $t$.

The factor 0.1584 represents the average proportion of the revenue derived from Texas highway subcontracts to contracts for DBEs. This factor is the product of two proportions:

1. Proportion of certified DBEs winning state highway subcontracts (i.e., 24 percent); and
2. Proportion (i.e., 66 percent) of a DBE's revenue earned from state highway work, given that the DBE has won an award.

These two proportions were obtained by examining 1986 and 1987 TSDHPT DBE and WBE construction reports along with DBE financial statements and represent the average of the 2 years.

## METHODS OF ESTIMATING CAPACITY $R_{ti}$

According to the financial literature, a viable firm (i.e., one that will be solvent) has adequate capital (*1,6,7*), can generate suitable profits or cash flow relative to debt (*1,3,8*), and has sufficient liquidity (*2,7,8*). On the basis of these aforementioned characteristics, five different methods can be used to estimate annual capacity:

- Net worth method,
- Revenue method,
- Regression method,
- Minimax method, and
- Working capital method.

### Net Worth Method

In this method, capacity is a multiple of net worth, calculated as follows:

$$R_{ti} = 14.2NW_{(t-1)i} \tag{2}$$

where $NW_{(t-1)i}$ equals the net worth in year $t - 1$ of the $i$th DBE.

The rationale behind using net worth is that net worth is a permanent source of funding, provides a rough indication of the firm's profitability, and is an approximation of the amount of protection afforded creditors. In turn, the viability of a contractor depends on the ability to receive credit.

The multiplier 14.2 is a threshold number equal to the ratio of sales to net worth found by Edmister (7). In that study, small businesses that have ratios higher than this amount do not have adequate capital to support such sales.

### Revenue Method

In this method, capacity is defined as

$$R_{ti} = 2R\max_{(t-1,\ldots)i} \quad (3)$$

where $R\max_{(t-1,\ldots)i}$ equals the highest revenue earned before year $t$ for the $i$th DBE.

The multiplier 2 is the maximum that a contractor could reasonably expect to manage (9). The assumption behind this method is that past work-load experience, as expressed by revenue, influences future work-load performance.

### Regression Method

In this method, capacity was predicted by multiple regression techniques using Texas DBEs as the data base. The type of data under consideration evaluated the DBE's financial resources (as derived from financial statements), bonding capacity, human resources (such as work and business experience), and other factors like geographic location, sex and race of owner, and work specialty. This information was obtained from the TSDHPT using DBE files from questionnaires sent to DBEs in Texas.

The regression model was based on lagged variables (i.e., independent variables for year $t - 1$ given that the response variable is for year $t$) as in the previous three models. Therefore, only DBEs that had reported complete financial statements for two consecutive years could be considered. Furthermore, other factors reduced the pool of DBEs that qualified for the multiple regression analysis. Firms that had a negative net worth (i.e., insolvent firms) or those that did not report financial statements reflecting adequate accounting procedures were omitted as well. From approximately 500 certified, highway-related DBEs (engineering firms and trucking firms not engaged in hauling were not considered), the number of firms meeting the criteria was reduced to 90.

Independent variables for this multiple regression model were selected using the stepwise computer selection procedure. This procedure starts with the best one-variable equation, but before adding subsequent variables, the statistics are examined for insignificance, and, if found, the variable is eliminated and another variable chosen. The procedure terminates for specified significance levels when variables can neither be added nor deleted (10). This procedure was modified slightly in that goodness-of-fit criteria were considered as well. This procedure led to a model in which one parameter was included that did not have the same level of statistical significance as the others selected, but did achieve a better fit.

From the collection of variables presented in Table 2, four statistically significant variables were selected that had the most explanatory power. These variables were total assets (TA), long-term debt (LTD), total assets times bonding capacity in dollars (TA * BOND), and working capital (WC).

Tables 3 and 4 present the various statistical tests of the regression model. Table 3 indicates that the regression model has adequate goodness-of-fit as shown by the adjusted coefficient of determination (adjusted $R^2$) of 0.698. Second, the analysis of variance test reveals that a statistically significant model ($\alpha \leq 0.0001$) was developed. In Table 4, the test of the individual parameter statistics ($t$ values) reveals that the parameters TA, TA * BOND, and LTD are highly significant ($\alpha < 0.05$), whereas WC does not have this level of significance (i.e., the chances that the coefficient of WC is zero are almost 13 in 100). Furthermore, the sign of the coefficients indicates that total assets, bonding capacity, and working capital increase future revenue, whereas long-term debt has a tendency to reduce future revenue. Hence, large, unleveraged, liquid DBEs that are able to secure bonding should produce the greatest revenue.

Because capacity is the maximum annual revenue that a firm can manage consistent with its financial and human resources, the upper 99 percent confidence intervals for the

TABLE 2 VARIABLES CONSIDERED FOR SELECTION

| Code | Description |
|---|---|
| NORG | Proprietorship (1) , partnership (2) ,corporation (3) |
| NBUSYRS | Number of years in business |
| BOND | Bonding capacity in $ (000's) |
| HIREV | Highest revenue in $ (000's) earned in one year |
| CA | Current assets in $ (000's) |
| TA** | Total assets in $(000's) |
| CL | Current assets in $(000's) |
| LTD ** | Long-term debt in $(000's) |
| TLIA | Total liabilities in $(000's) |
| NW | Net worth in $(000's) |
| WC ** | Working capital in $(000's) |
| LBOND | Whether or not firm is bondable (1=yes,0=no) |
| TCAP | NW + LTD |
| TA *BOND ** | Total assets times bonding capacity |
| TREND | Trend in revenue (1=increase,0=same,-1=decrease) |
| LOC | Geographic location of business (code used) |
| DENS | Population density of location |
| ETHNIC | Ethnicity/gender of owner (1=Black male ,2= Hispanic male, etc. ) |

TABLE 3 ANOVA FOR REGRESSION MODEL

| Source: | DF: | Sum Squares: | Mean Square: | F-test: |
|---|---|---|---|---|
| REGRESSION | 4 | 240439428.7 | 60109857.2 | 52.5 |
| RESIDUAL | 85 | 97304276.2 | 1144756.2 | p=.0001 |
| TOTAL | 89 | 337743704.9 | | |
| R: | R-squared: | | Adj. R- squared: | |
| .844 | .712 | | .698 | |

TABLE 4 BETA COEFFICIENT TABLE

| Parameter: | Value : | Std. Err. | t-value : | Probability: |
|---|---|---|---|---|
| INTERCEPT | 198.374 | | | |
| TA | 2.360 | .263 | 8.97 | .0001 |
| LTD | - 2.392 | .633 | 3.78 | .0003 |
| TA*BOND | 1.723 E-4 | 4.920E-5 | 3.50 | .0007 |
| WC | .286 | .186 | 1.54 | .1270 |

four parameters are used as the coefficients for this model. Upper 100 (1 − α) percent confidence estimates $B_{(1-\alpha)j}$, are constructed from the following equation (*10*):

$$B_{(1-\alpha)j} = b_j + t_{(\alpha,q)}s(c_{jj})^{0.5} \quad (4)$$

where

$b_j$ = *j*th parameter coefficient estimate,
$s$ = estimate of standard error,
$t_{(\alpha,q)}$ = *t*-value for α and *q* degrees of freedom, and
$c_{jj}$ = *j*th row and column element of the variance-covariance inverse matrix **C**.

From Table 5, DBE capacity is estimated using the following regression:

$$R_{ti} = 198.374 + 3.053\ (\text{TA}) - 0.724\ (\text{LTD}) + 0.000302\ (\text{TA} * \text{BOND}) + 0.775\ (\text{WC}) \quad (5)$$

All quantities for these variables are expressed in thousands.

### Minimax Method

The minimax method selects the minimum estimate of the previous three capacity (maximum revenue) methods applied to an individual DBE. The method can be expressed as

$$R_{ti} = \min\{R[1]_{ti}, R[2]_{ti}, R[3]_{ti}\} \quad (6)$$

The numbers in square brackets signify net worth, revenue, and regression methods, respectively. The working capital method was omitted because of possible accounting classification problems concerning current liabilities resulting in negative working capital, or some valid relationships between a DBE and prime contractor permitting assistance in bill-paying ability. Also, the regression method puts some weight on working capital.

The underlying concept of the minimax method is one of conservatism. Recall that the lack of net worth has been significantly associated with bankruptcy. Hence, some measure of an upper bound should be instituted.

TABLE 5 CONFIDENCE INTERVALS AND PARTIAL *F* TABLE

| Parameter: | 99% Lower: | 99% Upper: | Partial F: |
|---|---|---|---|
| INTERCEPT | | | |
| TA | 1.666 | 3.053 | 80.454 |
| LTD | -4.059 | -.724 | 14.285 |
| TA*BOND | 4.270E-5 | 3.020E-4 | 12.269 |
| WC | -.203 | .775 | 2.375 |

### Working Capital Method

Working capital is defined as the excess of current assets over current liabilities. The ratio of revenues to working capital is used as a measure of adequate liquidity by Robert Morris Associates (*11*) and Dunn & Bradstreet credit rating agencies (*12*). In addition, lack of adequate working capital was found to be a significant factor leading to bankruptcy (*1,3*).

This method calculates capacity as

$$R_{ti} = 20\text{WC}_{(t-1)i} \quad (7)$$

where $\text{WC}_{(t-1)i}$ equals the working capital in year $t - 1$ for the *i*th DBE.

The multiplier 20 is essentially that used by the TSDHPT for evaluating the bidding capacity of prequalified prime contractors. Although there is nothing sacrosanct about the value 20, this figure does place DBEs on an equal evaluation basis with Texas prime contractors. In addition, this value is more than twice the median value for typical highway contractors as determined by Dunn & Bradstreet (*12*).

## EVALUATION OF THE CAPACITY METHODS

Table 6 presents a comparison of the multiplier values used for the working capital, net worth, and revenue methods and the values from five highly capitalized general contractors—Blount, Morrison-Knudsen, Perini, Fluor, and the Slattery Group. Data were obtained from the Value Line Investment Survey (*13*) and represented the maximum values for each firm over the last 5 years. In each case, the DBE multiplier exceeds the median value for these large, publicly traded general contractors.

Both for the net worth and revenue methods, the DBE multipliers exceed the maximum values of these contractors. This is what one would desire for a number that purports to be a reasonable maximum. The working capital method does not achieve this, which suggests that this method may have too much variability to be a good predictor of capacity. Each multiplier for these methods exceeds the median value of several highly successful construction management firms in the heavy construction industry.

However, some caveat regarding the use of a sample of five largely capitalized general contractors for valid compar-

TABLE 6 COMPARISON OF MULTIPLIER VALUES

| | | Large Capitalized General Contractors (n=5) | | |
|---|---|---|---|---|
| Method | DBE Multiplier | Minimum | Median | Maximum |
| Working Capital | 20.0 | 5.4 | 16.9 | 130.0 |
| Net Worth | 14.2 | 3.0 | 5.7 | 8.7 |
| Revenue | 2.0 | 1.0 | 1.3 | 1.5 |

ative purposes is in order. First, the comparison of multipliers in Table 6 is used only for estimating purposes. Second, the five large general contractors used may not be representative of typical highway construction firms. Last, if the study team would have been able to obtain the multipliers for Texas prime contractors, these data would have been preferred. However, TSDHPT does not require all of the financial information necessary for this type of analysis from their prime contractors. Notwithstanding these drawbacks, the DBE multipliers are adequate maximums for the following reasons:

1. The multiplier of 14.2 is the threshold value cited in an empirically valid study (*7*);
2. The revenue multiplier of 2.0 implies workload growth of 100 percent per year, an enviable rate for any firm; and
3. As confirmed by Table 6, each of these multipliers exceeds the maximums of large, well-organized, and established construction firms.

Table 7 presents advantages and disadvantages of each of the methods. Each of the three multiplier methods has a drawback by basing capacity on a single factor. Net worth and revenue methods have the advantage of being consistent when compared with the large capitalized contractor values presented in Table 6. The working capital method does not achieve this consistency, but is widely used in the bonding industry. With respect to DBEs, this method may present accounting classification problems. The regression method overcomes the disadvantages of the other three in that several factors are considered. However, the regression model does not entirely explain DBE revenue-producing process. The minimax method has the advantage of using all of the methods previously discussed (except working capital), provides a conservative estimate, and seeks to place an upper bound on the estimates that is consistent with the financial research on bankruptcy. All methods have merit; however, the minimax method is judged to be the most reasonable method to use.

TABLE 7 EVALUATION OF CAPACITY ESTIMATION METHODS

| Method | Advantages | Disadvantages |
|---|---|---|
| Working Capital | • emphasizes importance of liquidity<br>• wide acceptance in bonding industry | • values too volatile for good predictor<br>• account problems<br>• considers only one factor<br>• can not measure explanatory power of model |
| Net Worth | • emphasizes importance of retained earnings & start up capital<br>• fairly consistent predictor*<br>• valid predictor of business failure | • considers only one factor<br>• can not measure explanatory power of model |
| Revenue | • most consistent predictor *<br>• considers past experience | • considers only one factor<br>• can not measure explanatory power |
| Regression | • several factors considered<br>• procedure can measure explanatory power of model | • explanatory power of model adequate, but not exceptional |
| Minimax | • considers 3 methods<br>• conservative estimates<br>• provides upper bounds | |

* as compared to Table 6 Comparison of Multiplier Values

## APPLICATION: ESTIMATION OF STATEWIDE CAPACITY

Texas DBE capacity is estimated by Equation 1, in which the values of $R_{ti}$ are computed using the minimax method as expressed by Equation 6. Table 8 presents example calculations for Texas DBE capacity.

First, the three maximum methods designated $R[1]$ to $R[3]$ on Table 8 are applied to each firm. Second, for each firm the minimum value designated $R[4]$ is calculated. Third, the statewide capacity is found by summing the $R[4]$ column and multiplying by a factor of 0.1584 as indicated by Equation 1. For firms that do not provide essential pieces of financial information required by this procedure, the average DBE capacity (i.e., $0.1584\Sigma R[4]/N$) is used. In Table 9, the value of $N$ is 140.

Table 9 presents 1988 DBE capacity estimates for the western, central, and northern regions of Texas, as well as those derived from DBEs headquartered out-of-state. For the state, work totaling an estimated $81 million can be performed by DBEs working in Texas. More than 53 percent is expected to come from the central portion of the state, 26.5 percent from the northern districts, and approximately 9 percent from the western region of Texas. According to this model, Texas would obtain 11 percent of its expected capacity from out-of-state sources.

The capacity figures for each region were calculated in the following manner:

$$\text{Total region capacity} = 0.1584\Sigma_i R[4]_i + (\text{Average firm capacity} \times K) \quad (8)$$

where $i$ equals $1, \ldots, m$, the number of firms in the region that have the essential pieces of financial information, and $K$ equals the number of certified DBE firms in the region not having the required financial information.

The average firm capacity is $0.1584\ \Sigma\ R[4]/140$.

The estimate of $81 million presented in Table 9 compares favorably with the $88 million that was actually achieved by Texas DBEs for the 1988 fiscal year.

## MODEL LIMITATIONS

Limitations of the model are the following:

1. Possible lack of generalizability of the model to other transportation departments. Data presented are based on

TABLE 8 EXAMPLE CALCULATIONS FOR DBE CAPACITY

All values in $(000's)

| | Required Financial Information | | | | | | | Capacity Estimation Method | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Firm | Revenue | TA | LTD | BOND | TA*BOND | WC | NW | R[1] | R[2] | R[3] | R[4] |
| 1 | 46.0 | 42.0 | 0.0 | 0.0 | 0.0 | 2.9 | 33.4 | 474.3 | **92.0** | 328.8 | **92.0** |
| 2 | 1400.0 | 406.0 | 180.0 | 200.0 | 81200.0 | 145.3 | 204.0 | 2898.6 | 2800.0 | **1444.7** | **1444.7** |
| . | | | | | | | | | | | |
| . | | | | | | | | | | | |
| . | | | | | | | | | | | |
| N | 6200.0 | 3038.2 | 1549.4 | 0.0 | 0.0 | 964.6 | 697.4 | 9903.1 | 12400.0 | 9099.8 | 9099.8 |

Notes:

R[1] = 14.2 NW

R[2] = 2 REV

R[3] = 198.374 +3.053TA - 0.724LTD +0.000302TA*BOND +0.775WC

Total capacity of Texas DBE's= .1584$\Sigma$ (R[4])

TABLE 9 ESTIMATION OF DBE CAPACITY FOR 1988

| **Region** | **Estimated Capacity ($ thousands)** | |
|---|---|---|
| Out of State | 8,900 | 11.0% |
| West Texas Districts: 3-8,23-25 | 7,600 | 9.4% |
| Central Texas Districts: 12-16,21 | 43,000 | 53.1% |
| North Texas Districts: 1,2,9-11,17-20 | 21,500 | 26.5% |
| **Total** | **81,000** | **100.0%** |

financial information of acceptable quality from Texas DBEs. Few firms provided audited financial statements.

2. Stability of the multiplier 0.1584 in Equation 1. Recall that this multiplier is derived from (a) the proportion of certified Texas DBEs receiving a contract or subcontract, and (b) the proportion of revenue applicable to DBE highway work, which represents a 2-year average.

3. Adequacy of the regression model. Even though the adjusted coefficient of determination was 0.698, approximately 30 percent of the variation in the response variable is unexplained by the model. The literature reveals that profitability was a good predictor of bankruptcy. This factor may be the needed variable. However, TSDHPT does not require this information, which therefore was unobtainable.

## CONCLUSION

The proposed minimax method for predicting firm capacity used in conjunction with Equation 1 appears to be a logical analytical procedure for estimating statewide capacity of DBEs. This methodology includes carefulness to not violate the empirical findings regarding the prediction of bankruptcy or firm failure.

However, the method presented is exploratory in nature and more data are needed to further adjust and validate the prediction model. An analysis of complete financial data for DBEs that have terminated their operations would help in this validation process. The problems are

1. Obtaining financial data of such distressed firms. The Small Business Administration, state highway departments, banks, and Dunn & Bradstreet would be likely sources. However, because of the sensitive and personal nature of this information, such organizations may be reluctant to release these data.

2. High likelihood that such DBE firms did not keep reliable financial statements that conform to acceptable quality standards. Lack of a proper record-keeping system contributes to a firm's downfall. The typical DBE in construction may be familiar with the construction aspects of a project, but not with the management aspects, such as budgeting, cost control, scheduling, and financial expertise.

In addition, regression parameters could be derived for nonminority subcontractors for comparative purposes. The problem is the cooperation needed from nonminority subcontractors. Experience indicates that the DBE program is such a controversial subject that the cooperation of nonminority subcontractors would be difficult to obtain. Because a substantial number of DBE and WBE firms have 5 years or less experience, a true comparison would require nonminority subcontractors to furnish financial information reflecting their status as contractors at the same level of experience. However, nonminority subcontractors may not have retained this type of information.

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