AN EVALUATION OF ACCOUNTING-BASED FINDING COSTS AS EFFICIENCY
MEASURES FOR OIL AND GAS EXPLORATION

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Executive Summary

We operationalized firm-specific exploration efficiency as the difference between a firm-specific intercept estimated in a fixed-effects panel data Cobb-Douglas production frontier model and the maximum firm-specific intercept estimated in that model. The production model was estimated during two different time periods, 1982-1985 and 1989-1992, allowing efficiency to vary intertemporally. This efficiency estimate served as a benchmark against which we compared various measures of inverse finding costs. We assumed that the degree of association with an efficiency benchmark is an important attribute of any finding cost measure and that, further, the degree of association may be used as a metric for choosing between alternative finding cost measures. Accordingly, we evaluated the cross-sectional statistical association between estimated efficiency and alternative inverse finding cost measures.

We discovered that the inverse finding cost measure that exhibited the strongest association with efficiency during the two time periods was a three-year moving-average finding cost which included exploration plus development expenditures as costs and reserve extensions and additions plus revisions as the units added. This result is interesting for three reasons. First, our results lend empirical support for the common practice of reporting three-year or five-year moving-average finding costs in

addition to single year. Second, our results lend empirical support for the argument that exploration plus development expenditures is a better measure of reserve replacement cost than exploration expenditures alone. Third, results add further documentation of an anomaly we reported a year ago in our preliminary report: Inverse finding cost measures computed with reserve revisions exhibit stronger statistical association with efficiency than those measures that exclude reserve revisions. This finding is anomalous because reserve revisions should represent random estimation errors and, therefore, would be expected to weaken the association rather than strengthen the association. That reserve revisions strengthen the association suggests that reserve revisions contain a systematic component and are not merely random estimation errors.

Finally, our study presented efficiency measures for 66 firms that survived the tumultuous decade of the 1980s, 146 firms that did not survive the decade, and 53 firms that entered the industry during the 1980s. The results suggest that survivor firms were more efficient than non-survivors or new firms, and that non-survivor firms were least efficient among the three groups. The results also show that the relative dispersion in efficiency measures decreased during the period 1989-1992 as compared to the relative dispersion during the period 1982-1985, suggesting that industry restructuring produced a more homogeneous set of firms.

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Introduction

This study presents empirical evidence intended to answer two related research questions. The first question asks whether finding cost measures developed from publicly available accounting data accurately assess the relative exploration efficiency of oil and gas firms. The question arises because experts in financial analysis disagree about the potential usefulness of the finding cost measure as an assessment tool. Answering this question is important because financial statement users are believed increasingly to use accounting-based finding costs to assess relative exploration efficiency.

The second question asks which types of accounting data produce a finding cost measure that constitutes the best gauge of relative exploration efficiency. The question arises because there exist several different ways of computing finding costs, and it remains an open question as to which measure, if any, is most strongly associated with exploration efficiency. Answering this question will provide helpful information to those who wish to assess the relative exploration efficiency of oil and gas firms using publicly available accounting information.

We estimate a fixed-effects panel data Cobb-Douglas production frontier model with heterogeneity in intercepts that is invariant within estimation periods (1982-1985, 1989-1992) but varies between estimation periods. These intercepts measure each

firm's productivity, and firm-specific efficiency is assessed relative to the estimated production frontier. The resulting efficiency measures are cross-sectionally correlated with various accounting-based inverse finding cost measures to determine which finding cost measure, if any, exhibits the strongest association with firm-specific efficiency. The analysis found that accounting-based inverse finding cost measures are strongly associated with exploration efficiency. In particular, a three-year moving-average finding cost which includes development expenditures and reserve revisions appears to dominate all others in terms of association with efficiency.

While not our principal focus, the research design also allowed us to explore how the relative efficiency of firms changed between the two estimation periods and to compare the mean efficiency of survivor firms to nonsurvivor firms and new entrants. The analysis showed that the mean efficiency measure of survivor firms was greater than both nonsurvivor firms and new entrants. The relative dispersion in the efficiency measure was greater during the 1982-1985 time period than during the 1989-1992 time period while the mean efficiency measure was greater during the later period, suggesting that the restructuring in the extractive petroleum industry during the 1980s eliminated less efficient firms and produced a more homogenous group of firms. The results provide reasonable and believable evidence on the pattern of efficiency changes that occurred during a period of widespread industry restructuring.

Motivation

The issue of whether average finding costs computed from publicly available financial statement data provide useful information about exploration efficiency, profitability, and future cash flows of an oil and gas firm is unsettled. These finding costs typically are computed by dividing the units of oil and gas discovered (with gas converted to a barrel of oil equivalent unit) into the costs incurred to "find" those units.

The conventional view that finding costs provide useful information is articulated by a recent textbook on financial statement analysis (White, Sondhi, and Fried 1994, p. 483), whose authors write that "While periodic finding costs are volatile, over longer time periods they provide evidence as to management's proficiency at the discovery of reserves." Echoing this view, the director of stock research at Salomon Brothers, Inc. argues that "After reserve replacement ratios, finding costs are the most critical internal factor for the oil companies" (Randol 1992, p.17).

Other analysts are less persuaded that finding costs provide useful information about an oil and gas company. Mayer (1992, p. 29) writes that

Wall Street performs a big disservice to the institutional investment community by placing undeserved emphasis on reserve replacement ratios and finding costs as measures of how well a company has done. Oil companies do not pay particular attention to these numbers, and no major oil company bases its own internal economics on them.

Firms' and industry-wide average finding costs computed from publicly available financial statement data increasingly are

cited, compared, and discussed with little question about their relevance. Juxtaposed against the increased reporting of finding costs (and, presumably the increased reliance placed on the measure by those asking for or issuing the reports), the disagreement among financial analysts concerning the usefulness of finding costs underscores the need for empirical research to evaluate the usefulness of the measure. We are aware of no study that has rigorously evaluated the potential usefulness of accounting-based finding costs computed from publicly available financial statement data.

Whether or not finding costs computed from publicly available financial statement data are useful is not the only important unsettled issue concerning finding costs. A second issue concerns how to compute finding costs. Among the key conceptual issues identified by Gaddis, Brock and Boynton (1992) are what 1) costs to use, 2) reserves to use, and 3) time period to use.

An important dimension of the cost issue concerns whether development costs should be included in the finding cost measure. Those opposing such inclusion argue that finding costs are intended to gauge exploration activity so that the finding cost measure should include exploration costs but not development costs. Others argue that the cost of developing reserves is actually a dimension of the effort to replace reserves and so the average finding cost measures should include development costs.

The reserve revision issue concerns whether to include revision of reserve estimates as part of reserve additions, while the time period issue is concerned with whether single-year or multiple-year finding costs are most appropriate. The usual argument advanced is that a lag structure exists between exploration spending and reserve additions, rendering single-year finding costs measures meaningless and multiple-year finding cost measures necessary. Three-year moving average finding cost measures are often advocated as a useful alternative to single-year measures.

In summary, our study is motivated by the disagreement among financial analysts concerning the 1) potential usefulness of finding costs as an assessment tool and 2) the relevant costs, reserves, and time periods to be included within the measure.

Research Design

Model

Our model is motivated by the work of Cornwell, Schmidt, and Sickles (1990) and Schmidt and Sickles (1984) who propose using panel data to estimate frontier production models. In their model, the intercept varies across firms, and differences in the intercept are interpreted as variation in productivity levels (or technical efficiency). The attractive feature of their model is that no strong distributional assumptions are required about technical efficiency, and no assumption of independence between technical efficiency and the explanatory variables is needed.

Reiss (1990) proposes a Cobb-Douglas reserve addition discovery function where reserve additions are a function of four factor inputs - exploratory wells drilled, development wells drilled, proved leaseholdings, and undeveloped leaseholdings. We use this reserve discovery function but propose a more parsimonious set of explanatory variables. Specifically, we propose to use current and lagged exploration and development spending as indices for the quantity of input factors used in reserve discovery. We also include production volume as an index of all other oil and gas activities, plant property and equipment, and labor and energy consumption. Our reserve discovery function (log transformed) is

(1) Model 1

$$\ln ADD = \ln \alpha_1 + \beta_1 \ln EXP + \beta_2 \ln DEV + \beta_3 \ln OUT + \beta_4 \ln LAGEXP + \beta_5 \ln LAGDEV + e$$

where

LNEXP	=	natural log of worldwide exploration expenditures
LNDEV	=	natural log of worldwide development expenditures
LNOUT	=	natural log of worldwide oil and gas production measured in barrel-of-oil equivalent units (BOE), with 6 mcf of natural gas equal to 1 BOE.
LAGEXP	=	one year lagged LNEXP

LAGDEV = one year lagged LNDEV
 LNADD = natural log of worldwide oil and gas reserve additions and extensions measured in BOE units.

The frontier intercept α is estimated as $\hat{\alpha} = \max_i (\ln \hat{\alpha}_i)$, and the level of efficiency for firm i (EFF) is $\ln \hat{\alpha}_i - \ln \hat{\alpha}$. We estimate model 1 as a fixed-effects least squares dummy variable model with $n-1$ firm dummies, so that $\ln \hat{\alpha}_i$ is computed as the sum of the estimated model intercept plus the estimated parameter for the firm dummy.

We estimate model 1 separately for the period 1982-1985 and the period 1989-1992 to permit firms' productivity levels to change during these two very different periods of oil and gas exploration activity. We assume that the years 1986-1987 were transition years between the exploration environments that characterized the two periods and therefore omit these years from the analysis. Data for 1981 and 1988 are used to provide lags for 1982 and 1989. We therefore use data from 10 of the 12 years in 1981-1992 omitting only the center two years, 1986 and 1987.

Sample

Our sample consists of firms for which uninterrupted observations on the variables were available in the Arthur Andersen Reserve Disclosure Database during either the period 1981-1985 or 1988-1992. This data source collects data on the oil and gas exploration activities disclosed by publicly held oil

and gas firms pursuant to Statement of Financial Accounting Standards No. 69.

The data screen produced three groups of firms. Group A consisted of 66 firms for which data were available during both the 1981-1985 period and the 1989-1992 period. Group B consisted of 146 firms for which data were available during the 1981-1985 period but were unavailable during the period 1985-1992. Group C consisted of 53 firms for which data were available during the period 1985-1992 but unavailable during the period 1982-1985. In general, firms within Group B were firms that merged, liquidated, or ceased oil exploration. We refer to Group B firms as "Non-survivors". In general, Group C consists of new firms or reorganized firms, so we call these firms "New Entrants". We term Group A firms as "Survivors" for obvious reasons. Descriptive statistics on the sample are presented in Table 1.

Table 1.--Descriptive statistics on sample firms.				
	Group A		Group B	Group C
	1982-1985	1988-1992	1982-1985	1989-1992
Exploration expenditures (millions of dollars)	\$46,826	\$30,064	\$15,199	\$21,183
Reserves added (BOE units)	8,252	9,167	3,721	8,514

Empirical Results

We pool Group A and Group B firms to form a panel dataset consisting of four annual observations (1982-1985) with one-year lags on 212 firms, and pool Group A and Group C firms to form a second panel dataset consisting of four annual observations (1989-1992) with one-year lags on 119 firms. To facilitate discussion, we refer to 1982-1985 and 1989-1992 as the early and late periods, respectively. Model 1 is separately estimated across pooled Group A/B and across pooled Group A/C and efficiency measures computed. The parameter estimates of Model 1 appear in Appendix A (printing of firm dummies was suppressed).

Comparing the Model 1 parameters estimated across 1982-1985 with the parameters estimated across 1989-1992 shows that both LNEXP and LNDEV are strongly significant in both periods, while neither LNOUT, LAGEXP, and LAGDEV are significant in either period. The estimated parameters show that a 1% increase in current exploration spending during 1982-1985 is associated with a 0.18% increase in current reserve additions, while a 1% increase in current exploration spending during 1989-1992 is associated with a 0.33% increase in current reserve additions. Similarly, a 1% increase in development spending during the early period is associated with 0.34 % increase in current reserve additions while a similar increase during the later period is associated with a 0.50 % increase in reserve quantities. It is interesting to note that the estimated elasticities for exploration and development spending in the early period are very

similar to the 0.11 and 0.44 (for exploration and development wells, respectively) reported by Reiss (1990) for a similar time period.

We tested the null hypothesis that exploration and development exhibit constant returns to scale by testing whether the estimated elasticities for LNEXP, LNDEV, and LNOUT sum to 1. The data were able to reject the null hypothesis in the early period but were unable to reject the null hypothesis in the later period. Because Reiss (1990) is unable to reject the null hypothesis of constant returns to scale during a time period that roughly corresponds to our early period, the issue of potential model misspecification arises. Our concern is not with whether a correlated omitted variable has biased the estimated elasticities. Rather, we are concerned with the effect an omitted variable might have on the estimated firm-specific intercepts since we are principally concerned with using these parameters from the model to estimate efficiency. More specifically, if a consistent estimate of the firm-specific intercept is given as

(2)

$$\hat{\alpha}_i^* = \bar{RA} - \beta' \bar{X} + \theta' \bar{Z}$$

but the estimated firm-specific intercept is

(3)

$$\hat{\alpha}_i = \bar{RA} - \beta' \bar{X}$$

then the estimated firm-specific intercept will be equal to $\hat{\alpha}_i^* + \hat{\theta}'Z$ (assuming Z is uncorrelated with the explanatory variables in the X vector). In particular, if Z is correlated with size then the estimated efficiencies, discussed below, could be attributed to size rather than to any underlying efficiency.

To evaluate whether the low estimated elasticities are attributable to a size-related omitted variable, we expand model 1 to include LNTRB - a size proxy operationalized as the natural log of beginning oil and gas reserves measured in BOE units. This model is labeled Model 2 in Appendix A. LNTRB is statistically significant in the early period but not in the later period, suggesting the possibility of size-related bias in the efficiency estimates from Model 1 during the early period. Consequently, we will test the robustness of our efficiency analysis from Model 1 by using firm-specific intercepts from Model 2 as well.

Appendix B presents the firm-specific efficiency measures (EFF) computed from Model 1 as $EFF = \ln \hat{\alpha}_i - \max_i (\ln \hat{\alpha}_i)$. We computed the mean EFF for firms in Group A and compared to the mean EFF computed for firms in Group B and Group C. These results are reported in Appendix C. Two results are especially noteworthy. First, notice that the mean EFF in Group A during the early period (.147) is greater than the mean EFF in Group B (.068), with the null hypothesis of equal means rejected at the 0.0001 level of significance. Similarly, the mean EFF in Group A during the late period (.283) is also greater than the mean EFF

in Group C (.254), but the difference is not statistically significant. Second, the relative dispersion in EFF as measured by the coefficient of variation shows much less dispersion in the later period (CV=69.18) than in the earlier (CV=122.28), suggesting that oil and gas firms not only have increased their overall level of efficiency but also are less dissimilar in terms of their level of efficiency - that is, firms are more homogenous in the later period.

While the level of and change in these efficiency measures is interesting in its own right, analysis of these measures is not our principal focus. These efficiency measures are simply a means to an end - they give us a benchmark against which we can compare alternative measures of average finding costs.

We operationalize eight different measures of average finding costs. Each definition represents a cell within a 2x2x2 matrix that is defined by whether 1) only exploration costs or both exploration and development costs are included in the numerator, 2) reserve revisions are or are not included in the denominator, and 3) whether finding costs are computed for a single year or as a moving average across 3 years. As a practical matter, we use the inverse of these finding costs in our analysis because reserve additions per dollar expended should be positively correlated with exploration efficiency, while dollars expended per unit of reserve additions should be negatively correlated with exploration efficiency. Table 2 summarizes these eight inverse finding cost measures.

Table 2.--Operational definitions of inverse finding costs	
Variable	Definition
IFC1	$1/[WWEXPL_t/WWBOEEXT_t]$
IFC3	$1/[\sum_{l=0}^2 WWEXPL_{t-1}/\sum_{l=0}^2 WWBOEEXT_{t-1}]$
IFC1R	$1/[WWEXPL_t/(WWBOEEXT_t+WWBOEREV_t)]$
IFC3R	$1/[\sum_{l=0}^2 WWEXPL_{t-1}/\sum_{l=0}^2 WWBOEEXT_{t-1}+WWBOEREV_{t-1}]$
IFC1D	$1/[(WWEXPL_t+WWDEV_t)/WWBOEEXT_t]$
IFC3D	$1/[(\sum_{l=0}^2 WWEXPL_{t-1}+WWDEV_{t-1})/\sum_{l=0}^2 WWBOEEXT_{t-1}]$
IFC1RD	$1/[(WWEXPL_t+WWDEV_t)/(WWBOEEXT_t+WWBOEREV_{t-1})]$
IFC3RD	$1/[(\sum_{l=0}^2 WWEXPL_{t-1}+WWDEV_{t-1})/(\sum_{l=0}^2 WWBOEEXT_{t-1}+WWBOEREV_{t-1})]$
<p>Note:</p> <p>WWEXPL is worldwide exploration expenditures. WWDEV is worldwide development expenditures. WWBOEEXT is worldwide reserve extensions and additions measured in BOE equivalent units. WWBOEREV is worldwide reserve estimate revisions measured in BOE equivalent units.</p>	

We are interested in assessing which definition of inverse average finding costs is most strongly associated with EFF. We present two forms of analyses - one in Appendix D and one in Appendix E. Appendix D reports correlation coefficients (both the Spearman rank and Pearson product moment) between EFF and the eight average inverse finding cost measures pooled across firms and across years within periods. That is, we pool inverse average finding cost measures for the years 1983-1985 for Groups

A and B and compute correlation coefficients. We do the same for Groups A and C for the period 1990-1992. We do not compute correlations coefficients for the years 1981-1982 and 1988-1989 because computation of inverse three year moving average finding costs requires two year lags, and thus inverse moving average finding cost measures are unavailable for these years. Appendix E repeats the analysis in Appendix D on a year-by-year basis. We present Appendix E for completeness but largely confine our discussion to Appendix D.

The Spearman rank correlations in Appendix D show that inverse average finding costs are strongly associated with EFF in both the early and late periods, and the association remains quite strong across the various definitions of inverse average finding costs. Thus, the data reject the null hypothesis that inverse average finding costs are independent of exploration efficiency as measured by EFF. However, the statistical insignificance of the Pearson correlation coefficients show that the association between EFF and inverse average finding costs is nonlinear, at least in the early period.

In both the early and later periods, inverse average finding cost measures that include exploration and development expenditures (IFC1D, IFC3D, IFC1RD, IFC3RD) consistently are more strongly associated with EFF than inverse average finding cost measures that include only exploration expenditures (IFC1, IFC3, IFC1R, IFC3R). The pattern is less consistent with respect to revision/no revisions and single-year/multiple-year measures. In

the early period, inverse average finding cost measures that include reserve revisions (IFC1R, IFC3R, IFC1RD, IFC3RD) consistently are more strongly associated with EFF than inverse finding cost measures that exclude reserve revisions (IFC1, IFC3, IFC1D, IFC3D). In the later period, however, the presence of reserve revisions appears to interact with the time period used: Single-year inverse average finding cost measures without reserve revisions (IFC1, IFC1D) are more strongly associated with EFF than single-year finding cost measures with reserve revisions (IFC1R, IFC1RD), while inverse moving-average finding costs with reserve revisions (IFC3R, IFC3RD) are more strongly associated with EFF than inverse moving-average finding costs without reserve revisions (IFC3, IFC3D). That inverse average finding cost measures which include reserve revisions are more strongly associated with EFF than those inverse average finding cost measures without revisions is anomalous if one assumes that reserve revisions represent random errors in estimating reserve quantities. One potential explanation for the result is suggested by the recent work of Clinch and Magliolo (1993) who report evidence consistent with investors discounting oil and gas stocks of firms with volatile reserve quantity estimate revisions. Their work suggests that managers bias their estimates of reserve estimates and that investors regard reserve revisions as value relevant and not as mere random estimation errors. Our findings reinforce the notion that reserve quantity revisions are more than just random estimation errors.

The pattern of association is also less consistent with respect to the use of single-year versus moving-average inverse finding costs, with the time period and the presence of reserve revisions appearing to interact during the early period: Single-year inverse finding cost measures without reserve revisions (IFC1, IFC1D) are more strongly associated with EFF than moving average inverse finding cost measures without reserve revisions (IFC3, IFC3D), while moving-average inverse finding costs with reserve revisions (IFC3R, IFC3RD) are more strongly associated with EFF than single-year inverse finding costs with reserve revisions (IFC1R, IFC1D). In the late period, three out of the four single year inverse finding costs (IFC1, IFC1R, IFC1D) are more strongly associated with EFF than moving-average inverse finding costs (IFC3, IFC3R, IFC3D).

During both the early and late periods, inverse finding cost measure IFC3RD is most strongly associated with EFF, having a Spearman rank correlation coefficient of .32 and .42 in the early period and late periods, respectively. This inverse finding cost measure is a moving-average measure that includes both reserve revisions and development costs.

Additionally, a comparison of the Spearman rank correlation coefficients between the two periods reveals that the strength of the association between EFF and inverse finding costs increased for all eight definitions of inverse finding costs. Apparently the usefulness of inverse finding costs as a measure of exploration efficiency has increased in recent years.

We repeated the analysis using efficiency measures estimated from Model 2 and the results were qualitatively unchanged. We computed the Pearson product moment correlation coefficient between the EFF from model 1 and model 2 and found the two measures to be virtually the same (correlation coefficient of 0.98 significant at $p=.0001$). Thus, our results appear robust to potential size-related omitted variables that might cause size to bias the efficiency estimates.

Summary and Conclusions

We operationalized firm-specific exploration efficiency as the difference between a firm-specific intercept estimated in a fixed-effects panel data Cobb-Douglas production frontier model and the maximum firm-specific intercept estimated in that model. The production model was estimated during two different time periods, 1982-1985 and 1989-1992, allowing efficiency to vary intertemporally. This efficiency estimate served as a benchmark against which we compared various measures of inverse finding costs. We assumed that the degree of association with an efficiency benchmark is an important attribute of any finding cost measure and that, further, the degree of association may be used as a metric for choosing between alternative finding cost measures. Accordingly, we evaluated the cross-sectional statistical association between estimated efficiency and alternative inverse finding cost measures.

We discovered that the inverse finding cost measure that exhibited the strongest association with efficiency during the

two time periods was a three-year moving- average finding cost which included exploration plus development expenditures as costs and reserve extensions and additions plus revisions as the units added. This result is interesting for three reasons. First, our results lend empirical support for the common practice of reporting three-year or five-year moving-average finding costs in addition to single year. Second, our results lend empirical support for the argument that exploration plus development expenditures is a better measure of reserve replacement cost than exploration expenditures alone. Third, results add further documentation of an anomaly we reported a year ago in our preliminary report: Inverse finding cost measures computed with reserve revisions exhibit stronger statistical association with efficiency than those measures that exclude reserve revisions. This finding is anomalous because reserve revisions should represent random estimation errors and, therefore, would be expected to weaken the association rather than strengthen the association. That reserve revisions strengthen the association suggests that reserve revisions contain a systematic component and are not merely random estimation errors.

Finally, our study presented efficiency measures for 66 firms that survived the tumultuous decade of the 1980s, 146 firms that did not survive the decade, and 53 firms that entered the industry during the 1980s. The results suggest that survivor firms were more efficient than non-survivors or new firms, and that non-survivor firms were least efficient among the three

groups. The results also show that the relative dispersion in efficiency measures decreased during the period 1989-1992 as compared to the relative dispersion during the period 1982-1985, suggesting that industry restructuring produced a more homogeneous set of firms.

Further Studies

This study suggests two potentially fruitful avenues for future work. First, the finding that inverse finding cost measures are associated with exploration efficiency implies that finding cost measures may provide useful information to investors if knowledge of relative exploration efficiency assists investors in assessing a firm's future cash flows or systematic risk. Understanding whether investors use finding costs in pricing oil and gas common stocks would provide insight into the actual relevance of finding cost measures. Thus, one avenue for future research would be to test whether finding cost measures convey useful information to investors.

Second, the finding that reserve revisions may contain a systematic component begs the question of what that component might be. Clinch and Magliolo (1992) similarly conclude that reserve revisions appear to contain systematic aspects, and they find this result puzzling because they see no apparent reason why management would benefit from biasing their reserve estimates. Future research could attempt to identify and explain the apparent systematic component of reserve revisions.

APPENDIX A
PRODUCTION MODELS

Appendix A
 Production Model for 1982-1985 Time Period
 Group A (Survivors) and Group B (Non-survivors)
 (Printing of Firm Dummies Suppressed)

09:38 Sunday September 25, 1994

Model: Model 1
 Dependent Variable: LNADD

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	216	4033.85682	18.67526	26.272	0.0001
Error	631	448.53700	0.71084		
C Total	847	4482.39382			

Root MSE	0.84311	R-square	0.8999
Dep Mean	7.21897	Adj R-sq	0.8657
C.V.	11.67909		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T	Variable Label
INTERCEP	1	1.041721	0.66102802	1.576	0.1155	Intercept
LNEXP	1	0.186407	0.04809661	3.876	0.0001	LOG EXPLORATION COSTS
LNDEV	1	0.343057	0.05234754	6.553	0.0001	LOG DEVELOPMENT COSTS
LNOUT	1	-0.041525	0.08678492	-0.478	0.6325	LOG PRODUCTION IN BOE
LAGEXP	1	-0.020541	0.04841353	-0.424	0.6715	LAG LNEXP
LAGDEV	1	0.027625	0.04768289	0.579	0.5626	LAG LNDEV

Appendix A
 Production Model for 1982-1985 Time Period
 Group A (Survivors) and Group B (Non-survivors)
 Test of Linear Restrictions

09:38 Sunday September 25, 1994

Dependent Variable: LNADD
 Test: R1

Numerator: 19.7045 DF: 1 F value: 27.7202
 Denominator: 0.710835 DF: 631 Prob>F: 0.0001

Dependent Variable: LNADD
 Test: R2

Numerator: 19.6086 DF: 1 F value: 27.5853
 Denominator: 0.710835 DF: 631 Prob>F: 0.0001

Dependent Variable: LNADD
 Test: R3

Numerator: 19.5218 DF: 1 F value: 27.4632
 Denominator: 0.710835 DF: 631 Prob>F: 0.0001

Dependent Variable: LNADD
 Test: R4

Numerator: 0.1510 DF: 2 F value: 0.2124
 Denominator: 0.710835 DF: 631 Prob>F: 0.8087

R1: $LNEXP + LNDEV + LNOUT = 1$
 R2: $LNEXP + LNDEV + LNOUT + LAGEXP = 1$
 R3: $LNEXP + LNDEV + LNOUT + LAGEXP + LAGDEV = 1$
 R4: $LAGEXP = LAGDEV = 0$

Appendix A
Production Model for 1989-1992 Time Period
Group A (Survivors) and Group C (New Entrants)
(Printing of Firm Dummies Suppressed)

09:38 Sunday September 25, 1994

Model: Model 1
Dependent Variable: LNADD

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	123	2280.20305	18.53824	25.216	0.0001
Error	352	258.78304	0.73518		
C Total	475	2538.98609			

Root MSE	0.85743	R-square	0.8981
Dep Mean	8.42914	Adj R-sq	0.8625
C.V.	10.17217		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T	Variable Label
INTERCEP	1	0.830332	1.01387661	0.819	0.4134	Intercept
LNEXP	1	0.333934	0.06687624	4.993	0.0001	LOG EXPLORATION COSTS
LNDEV	1	0.501753	0.09017741	5.564	0.0001	LOG DEVELOPMENT COSTS
LNOUT	1	-0.069418	0.25254020	-0.275	0.7836	LOG PRODUCTION IN BOE
LAGEXP	1	-0.048903	0.07280234	-0.672	0.5022	LAG LNEXP
LAGDEV	1	-0.006336	0.08773834	-0.072	0.9425	LAG LNDEV

Appendix A
 Production Model for 1989-1992 Time Period
 Group A (Survivors) and Group C (New Entrants)
 Test of Linear Restrictions

09:38 Sunday September 25, 1994

Dependent Variable: LNADD
 Test: R1

Numerator:	0.6616	DF:	1	F value:	0.9000
Denominator:	0.735179	DF:	352	Prob>F:	0.3434

Dependent Variable: LNADD
 Test: R2

Numerator:	1.0662	DF:	1	F value:	1.4503
Denominator:	0.735179	DF:	352	Prob>F:	0.2293

Dependent Variable: LNADD
 Test: R3

Numerator:	1.5153	DF:	1	F value:	2.0612
Denominator:	0.735179	DF:	352	Prob>F:	0.1520

Dependent Variable: LNADD
 Test: R4

Numerator:	0.1685	DF:	2	F value:	0.2292
Denominator:	0.735179	DF:	352	Prob>F:	0.7953

R1: $LNEXP + LNDEV + LNOUT = 1$
 R2: $LNEXP + LNDEV + LNOUT + LAGEXP = 1$
 R3: $LNEXP + LNDEV + LNOUT + LAGEXP + LAGDEV = 1$
 R4: $LAGEXP = LAGDEV = 0$

Appendix A
Production Model for 1982-1985 Time Period
Group A (Survivors) and Group B (Non-survivors)
(Printing of Firm Dummies Suppressed)

09:38 Sunday September 25, 1994

Model: MODEL2
Dependent Variable: LNADD

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	217	4037.62804	18.60658	26.356	0.0001
Error	630	444.76578	0.70598		
C Total	847	4482.39382			
Root MSE		0.84022	R-square	0.9008	
Dep Mean		7.21897	Adj R-sq	0.8666	
C.V.		11.63911			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T	Variable Label
INTERCEP	1	1.884333	0.75291702	2.503	0.0126	Intercept
LNEXP	1	0.177908	0.04807283	3.701	0.0002	LOG EXPLORATION COSTS
LNDEV	1	0.342229	0.05216959	6.560	0.0001	LOG DEVELOPMENT COSTS
LNOUT	1	0.144331	0.11809530	1.222	0.2221	LOG PRODUCTION IN BOE
LAGEXP	1	-0.012977	0.04835870	-0.268	0.7885	
LAGDEV	1	0.040856	0.04786325	0.854	0.3937	
LNTRB	1	-0.272307	0.11781855	-2.311	0.0211	LOG BEGIN. BOE RESERVES

Appendix A
 Production Model for 1982-1985 Time Period
 Group A (Survivors) and Group B (Non-survivors)
 Test of Linear Restrictions

09:38 Sunday September 25, 1994

Dependent Variable: LNADD
 Test: R1

Numerator:	23.4740	DF:	1	F value:	33.2504
Denominator:	0.705977	DF:	630	Prob>F:	0.0001

Dependent Variable: LNADD
 Test: R2

Numerator:	5.1788	DF:	1	F value:	7.3357
Denominator:	0.705977	DF:	630	Prob>F:	0.0069

Dependent Variable: LNADD
 Test: R3

Numerator:	4.0471	DF:	1	F value:	5.7326
Denominator:	0.705977	DF:	630	Prob>F:	0.0169

Dependent Variable: LNADD
 Test: R4

Numerator:	0.2596	DF:	2	F value:	0.3677
Denominator:	0.705977	DF:	630	Prob>F:	0.6925

R1: LNEXP+LNDEV+LNOUT+LNTRB=1
 R2: LNEXP+LNDEV+LNOUT+LAGEXP=1
 R3: LNEXP+LNDEV+LNOUT+LAGEXP+LAGDEV=1
 R4: LAGEXP=LAGDEV=0

Appendix A
Production Model for 1989-1992 Time Period
Group A (Survivors) and Group C (New Entrants)
(Printing of Firm Dummies Suppressed)

09:38 Sunday September 25, 1994

Model: Model2
Dependent Variable: LNADD

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	124	2280.86814	18.39410	25.013	0.0001
Error	351	258.11795	0.73538		
C Total	475	2538.98609			

Root MSE	0.85754	R-square	0.8983
Dep Mean	8.42914	Adj R-sq	0.8624
C.V.	10.17355		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T	Variable Label
INTERCEP	1	0.495420	1.07342652	0.462	0.6447	Intercept
LNEXP	1	0.333010	0.06689237	4.978	0.0001	LOG EXPLORATION COSTS
LNDEV	1	0.492210	0.09074621	5.424	0.0001	LOG DEVELOPMENT COSTS
LNOUT	1	-0.179937	0.27802736	-0.647	0.5179	LOG PRODUCTION IN BOE
LAGEXP	1	-0.051512	0.07286392	-0.707	0.4801	
LAGDEV	1	-0.039133	0.09428379	-0.415	0.6784	
LNTRB	1	0.156919	0.16500215	0.951	0.3423	LOG BEGIN. BOE RESERVES

Appendix A
 Production Model for 1989-1992 Time Period
 Group A (Survivors) and Group C (New Entrants)
 Test of Linear Restrictions

09:38 Sunday September 25, 1994

Dependent Variable: LNADD
 Test: R1

Numerator:	0.4630	DF:	1	F value:	0.6296
Denominator:	0.735379	DF:	351	Prob>F:	0.4281

Dependent Variable: LNADD
 Test: R2

Numerator:	1.6859	DF:	1	F value:	2.2925
Denominator:	0.735379	DF:	351	Prob>F:	0.1309

Dependent Variable: LNADD
 Test: R3

Numerator:	2.1588	DF:	1	F value:	2.9356
Denominator:	0.735379	DF:	351	Prob>F:	0.0875

Dependent Variable: LNADD
 Test: R4

Numerator:	0.2480	DF:	2	F value:	0.3372
Denominator:	0.735379	DF:	351	Prob>F:	0.7140

R1: LNEXP+LNDEV+LNOUT+LNTRB=1
 R2: LNEXP+LNDEV+LNOUT+LAGEXP=1
 R3: LNEXP+LNDEV+LNOUT+LAGEXP+LAGDEV=1
 R4: LAGEXP=LAGDEV=0

APPENDIX B
FIRM SPECIFIC EFFICIENCY MEASURES

Appendix B
Firm-Specific Efficiency Measures
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985

09:38 Sunday September 25, 1994

OBS	NAME	SMBL	EFF	GROUP
1	EXXON	XON	1.00000	A - Survivors
2	TENNECO	TGT	0.60001	B - Non-survi
3	SHELL OIL	4108A	0.54318	B - Non-survi
4	ATLANTIC RICHFIELD (ARCO)	ARC	0.51767	A - Survivors
5	** TEXAS OIL & GAS	TXO	0.45955	B - Non-survi
6	UNOCAL (UNION OIL OF CA)	UCL	0.45250	A - Survivors
7	SUN COMPANY	SUN	0.40726	A - Survivors
8	AMOCO (STD OF INDIANA)	AN	0.38217	A - Survivors
9	MOBIL	MOB	0.35055	A - Survivors
10	OCCIDENTAL PETRO.	OXY	0.34969	A - Survivors
11	DUPONT (CONOCO)	DD	0.33724	A - Survivors
12	CHEVRON (STD CALIFORNIA)	CHV	0.31772	A - Survivors
13	UNION PACIFIC	UNP	0.31235	A - Survivors
14	CANADIAN PACIFIC LTD.	CP	0.29291	A - Survivors
15	TEXACO	TX	0.27611	A - Survivors
16	ENSERCH	ENS	0.25191	A - Survivors
17	DOME PETROLEUM	DMP	0.24107	B - Non-survi
18	CONSOL. NAT. GAS	CNG	0.23621	A - Survivors
19	TEXAS EASTERN CORP.	TET	0.22930	B - Non-survi
20	PANHANDLE EASTERN	PEL	0.18882	B - Non-survi
21	MITCHELL ENERGY	MND	0.18637	A - Survivors
22	** PETRO-LEWIS	4356B	0.18603	B - Non-survi
23	PHILLIPS PETROLEUM	P	0.18352	A - Survivors
24	DIAMOND SHAMROCK	DRM	0.18251	B - Non-survi
25	KERR-MCGEE CORPORATION	KMG	0.18079	A - Survivors
26	NOBLE AFFILIATES	NBL	0.17622	A - Survivors
27	MURPHY OIL	MUR	0.17055	A - Survivors
28	PENNZOIL	PZL	0.16833	A - Survivors
29	MONOGRAM OIL & GAS	5235B	0.16288	B - Non-survi
30	CABOT CORP.	CBT	0.15784	A - Survivors
31	ENRON (HNG/INTERNORTH)	ENE	0.15698	B - Non-survi
32	ARKLA	ALG	0.15471	B - Non-survi
33	DEKALB CORP	ENRGB	0.14934	A - Survivors
34	** HIRAM WALKER RES.	D.HAV	0.14849	B - Non-survi
35	ODECO	ODR	0.14369	B - Non-survi
36	ARGO PETROLEUM	4268B	0.13673	B - Non-survi
37	ASAMERA	ASM	0.13652	B - Non-survi
38	WORLDWIDE ENERGY	WWE	0.13584	B - Non-survi
39	ENERGY OIL	EOI	0.13470	B - Non-survi
40	EQUITABLE RESOURCES	EQT	0.13439	A - Survivors

Appendix B
Firm-Specific Efficiency Measures
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985

09:38 Sunday September 25, 1994

OBS	NAME	SMBL	EFF	GROUP
41	SANTA FE SO. PACIFIC	SFX	0.13380	B - Non-survi
42	AMERADA HESS	AHC	0.13327	A - Survivors
43	COASTAL	CGP	0.13218	A - Survivors
44	CRYSTAL OIL	COR	0.13033	A - Survivors
45	** INEXCO OIL	INX	0.12980	B - Non-survi
46	AMERICAN PETROFINA	API.A	0.12473	B - Non-survi
47	READING & BATES	RB	0.12461	B - Non-survi
48	HUSKY OIL	HYO	0.12439	B - Non-survi
49	HAMILTON OIL CORP	HAML	0.12437	B - Non-survi
50	TRANSCO ENERGY	E	0.12406	B - Non-survi
51	STANDARD OIL (SOHIO)	SRD	0.12314	B - Non-survi
52	LOUISIANA LAND & EXPL.	LLX	0.11866	A - Survivors
53	WESTCOAST TRANSMISSION	WTC	0.11778	B - Non-survi
54	HOWELL CORP.	HWL	0.11749	A - Survivors
55	MESA LTD. P SHIP (MLP)	MLP	0.11737	B - Non-survi
56	APACHE CORP.	APA	0.11553	A - Survivors
57	CONQUEST EXPL.	CQX	0.11314	B - Non-survi
58	TEXAS GAS RES. (CSX)	CSX	0.11245	B - Non-survi
59	GOODYEAR/CELERON	GT	0.11024	B - Non-survi
60	LEAR PET. PTRS. (MLP)	LPP	0.10827	B - Non-survi
61	TOTAL PETROLEUM	TPN	0.10701	B - Non-survi
62	BOW VALLEY IND.	BVI	0.10696	A - Survivors
63	NUMAC OIL & GAS LTD	NMC	0.10485	A - Survivors
64	FREEPORT-MCMORAN	FTX	0.10443	B - Non-survi
65	TEXAS INT L	TEICC	0.09936	B - Non-survi
66	ASHLAND OIL	ASH	0.09532	A - Survivors
67	POGO PRODUCING CO.	PPP	0.09468	A - Survivors
68	** UNIVERSAL RESOURCES	UVR	0.09362	B - Non-survi
69	** MIDCON	MCN.1	0.09267	B - Non-survi
70	SOUTHERN UNION COMPANY	SUG	0.09251	B - Non-survi
71	PACIFIC LIGHTING CORP.	PLT	0.08819	B - Non-survi
72	SOUTHDOWN INC	SDW	0.08818	B - Non-survi
73	CONSOL. OIL & GAS	CGS	0.08801	B - Non-survi
74	PARK-OHIO INDUS.	PKOH	0.08791	B - Non-survi
75	SCURRY RAINBOW OIL	SRB	0.08671	B - Non-survi
76	SABINE CORP.	SAB	0.08620	B - Non-survi
77	INTER-CITY GAS	ICG	0.08541	B - Non-survi
78	QUESTAR CORPORATION	STR	0.08471	A - Survivors
79	COLUMBIA GAS SYS.	CG	0.08369	A - Survivors
80	NICOR	GAS	0.08221	A - Survivors

Appendix B
Firm-Specific Efficiency Measures
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985

09:38 Sunday September 25, 1994

OBS	NAME	SMBL	EFF	GROUP
81	QUAKER STATE OIL REFINING	KSF	0.081046	B - Non-survi
82	CHIEFTAIN DEV.	CID	0.080931	B - Non-survi
83	GLOBAL MARINE	GLM	0.080339	B - Non-survi
84	CENERGY CORP. (CENTEX)	CRG	0.074855	B - Non-survi
85	SOUTHWESTERN ENERGY CO	SWN	0.072902	A - Survivors
86	ALEXANDER ENERGY	AEOK	0.071823	A - Survivors
87	ONEOK INC	OKE	0.071806	A - Survivors
88	DIV. ENERGIES/DYCO PET.	DEI	0.068254	B - Non-survi
89	KANEB SERVICES, INC.	KAB	0.067658	B - Non-survi
90	** STATEX PETROLEUM	SEP	0.066747	B - Non-survi
91	CARLING O KEEFE	CKB	0.065725	B - Non-survi
92	TRITON ENERGY	OIL	0.065455	A - Survivors
93	OAKRIDGE ENERGY INC	OAKR	0.065018	B - Non-survi
94	WISER OIL	WISE	0.064541	A - Survivors
95	NORCEN ENERGY RES.	NCN	0.064456	A - Survivors
96	** PIONEER CORP.	PNA	0.064321	B - Non-survi
97	TIDEWATER	TDW	0.062840	B - Non-survi
98	BOGERT OIL	BOGO	0.059871	B - Non-survi
99	FOREST OIL	FOIL	0.059369	A - Survivors
100	SAGE ENERGY	6041C	0.058896	A - Survivors
101	HOMESTAKE MINING COMPANY	HM	0.058712	B - Non-survi
102	CROWN ZELLERBACH	JR1	0.058241	B - Non-survi
103	NORTHERN MICHIGAN EXPL.	CMS	0.057449	A - Survivors
104	ALLEGHENY & WESTERN	ALGH	0.057068	A - Survivors
105	MAY PETROLEUM	MAYP	0.056946	B - Non-survi
106	MOORE MCCORMACK	MMR	0.056347	B - Non-survi
107	NUGGET OIL CORP.	3NUGOC	0.056199	B - Non-survi
108	WAINOCO OIL	WOL	0.055112	A - Survivors
109	ZAPATA	ZOS	0.054716	B - Non-survi
110	AMERICAN OAKWOOD	D.AFM	0.051500	B - Non-survi
111	MAYNARD OIL	MOIL	0.051300	A - Survivors
112	** CAMBRIDGE ROYALTY	CRCO	0.050924	B - Non-survi
113	SUNSHINE MINING	SSC	0.050589	B - Non-survi
114	SONAT INC	SNT	0.050495	A - Survivors
115	MSR EXPL. LTD.	MSR	0.049662	B - Non-survi
116	ALAMCO	AXO	0.047836	B - Non-survi
117	MONTANA POWER	MTP	0.047830	A - Survivors
118	MAPCO	MDA	0.047474	B - Non-survi
119	CALLON PETROLEUM	CLNP	0.046738	B - Non-survi
120	GALAXY OIL	GOX	0.046009	B - Non-survi

Appendix B
Firm-Specific Efficiency Measures
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985

09:38 Sunday September 25, 1994

OBS	NAME	SMBL	EFF	GROUP
121	HADSON CORPORATION	HAD	0.045231	B - Non-survi
122	NORTH CANADIAN OILS	NCD	0.044878	A - Survivors
123	NEWHALL RESOURCES (MLP)	6048B	0.044335	B - Non-survi
124	CANADIAN OCCIDENTAL PETRO	CXY	0.043885	A - Survivors
125	CROWN CENTRAL PET.	CNP.A	0.043343	B - Non-survi
126	MCO RESOURCES, INC.	MCR.	0.042833	B - Non-survi
127	AMAX	AMX	0.042668	B - Non-survi
128	SPARTON CORP.	SPA	0.041667	B - Non-survi
129	W. R. GRACE	GRA	0.041455	B - Non-survi
130	ADAMS RES. & ENERGY	AE	0.041215	B - Non-survi
131	HELMERICH & PAYNE	HP	0.041074	A - Survivors
132	CAMPBELL RESOURCES	CCH	0.040647	B - Non-survi
133	NEWMONT MINING	NEM	0.040384	B - Non-survi
134	NUI CORP.	NUI	0.040277	B - Non-survi
135	MCFARLAND ENERGY	MCFE	0.039939	A - Survivors
136	TOM BROWN	TMBR	0.039935	A - Survivors
137	ALTA ENERGY	ALE	0.037591	B - Non-survi
138	PRESIDIO OIL	PRS	0.037230	B - Non-survi
139	PARTNERS OIL	PAROA	0.037098	B - Non-survi
140	RANGER OIL LIMITED	RGO	0.036184	A - Survivors
141	UNIT CORP. (UNIT D. & E.)	UNT	0.036056	A - Survivors
142	WILSHIRE OIL	WOC	0.034812	A - Survivors
143	BRACKEN EXPL.	BXCO	0.033844	B - Non-survi
144	TESORO PETROLEUM CORP	TSO	0.031799	A - Survivors
145	ENSOURCE, INC.	EEE	0.030824	B - Non-survi
146	TEXAS AM. ENERGY	COLD	0.029958	B - Non-survi
147	CHAPMAN ENERGY	CHPN	0.029415	B - Non-survi
148	GULF RES. & CHEM. CORP.	3GUSC	0.028173	B - Non-survi
149	BARUCH-FOSTER	BFO	0.027757	B - Non-survi
150	DISCOVERY OIL	DISQE	0.027418	B - Non-survi
151	BROCK EXPL.	BKE	0.027025	A - Survivors
152	KENCOPE ENERGY	KCOP	0.026270	B - Non-survi
153	BELCOR INC.	BLCR	0.024460	B - Non-survi
154	EQUITY OIL	EQTY	0.023692	A - Survivors
155	FIRST MISSISSIPPI	FRM	0.023337	B - Non-survi
156	HLH PETROLEUM	HLHP	0.022904	B - Non-survi
157	ROYAL RESOURCES CORP	RRCO	0.022544	B - Non-survi
158	UNITED CANSO	UTC	0.022532	B - Non-survi
159	TIPPERARY CORP.	TPY	0.022463	B - Non-survi
160	BURTON/HAWKS	HAWK	0.022390	B - Non-survi

Appendix B
Firm-Specific Efficiency Measures
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985

09:38 Sunday September 25, 1994

OBS	NAME	SMBL	EFF	GROUP
161	OXOCO	OXOCO	0.021421	B - Non-survi
162	PRAIRIE OIL ROY.	POY	0.021317	A - Survivors
163	PLANO PETROLEUM	6331B	0.021252	B - Non-survi
164	NOARKO RESOURCES	NOAHE	0.020264	B - Non-survi
165	BEARD OIL	BOC	0.019610	A - Survivors
166	PRIMA ENERGY	PENG	0.018977	B - Non-survi
167	COLUMBINE EXPL.	4654B	0.018336	B - Non-survi
168	HERSHEY OIL	HSO	0.018285	B - Non-survi
169	WESTBURNE INT L.	WBI	0.018167	B - Non-survi
170	ROBERTS OIL & GAS	3ROGI	0.017784	B - Non-survi
171	CIMARRON	CIMN	0.017749	B - Non-survi
172	HENRY ENERGY	HNRY	0.017628	B - Non-survi
173	REGAL PETROLEUM	RPLO	0.017484	B - Non-survi
174	PYRO ENERGY	BTU	0.017461	B - Non-survi
175	PLAINS RESOURCES INC	PLX	0.017075	A - Survivors
176	GEORESOURCES	GEOI	0.016980	B - Non-survi
177	** MAY ENERGY PTRS. (MLP)	MEP	0.015518	B - Non-survi
178	DECA ENERGY	DCAS	0.015453	B - Non-survi
179	AMERICAN NAT L. PET.	ANPC	0.015003	A - Survivors
180	TUCKER DRILLING	TUCK	0.014988	B - Non-survi
181	AMERICAN EXPLORATION	AX	0.014719	A - Survivors
182	INTRAMERICAN O & M	5278B	0.014462	B - Non-survi
183	BASIC EARTH SCIENCE	BSIC	0.014449	B - Non-survi
184	GREENWOOD RES.	GRRLC	0.014122	B - Non-survi
185	TOKLAN OIL	5827B	0.013828	B - Non-survi
186	RIDGEWAY EXCO	ROED	0.013069	B - Non-survi
187	GEODYNE RESOURCES	GEOD	0.012004	B - Non-survi
188	RESOURCE EXPL. INC.	REXI	0.011767	B - Non-survi
189	FALCON OIL & GAS	FLOG	0.011280	B - Non-survi
190	FOSSIL OIL & GAS	4217B	0.010707	B - Non-survi
191	ARCH PETROLEUM INC.	ARCH	0.010678	B - Non-survi
192	DOUBLE EAGLE PET.	DBLE	0.010442	B - Non-survi
193	SAGE DRILLING	SAGE	0.009939	B - Non-survi
194	ARGONAUT ENERGY	ARGN	0.009935	B - Non-survi
195	CIBOLA ENERGY	CBLA	0.009915	B - Non-survi
196	MINDEN OIL AND GAS	MOGI	0.009737	B - Non-survi
197	CONVEST ENERGY	CVST	0.009513	B - Non-survi
198	SUMMIT ENERGY	SUM	0.009300	B - Non-survi
199	GOLDEN OIL CO.	GOCO.	0.009297	B - Non-survi
200	ALTIX INDUSTRIES	3ALTIX	0.009038	B - Non-survi

Appendix B
Firm-Specific Efficiency Measures
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985

09:38 Sunday September 25, 1994

OBS	NAME	SMBL	EFF	GROUP
201	ASPEN EXPL.	3AXPN	.0078642	B - Non-survi
202	GREAT EAST. ENERGY	GREN	.0075614	B - Non-survi
203	WICHITA INDUSTRIES	WRO	.0070882	B - Non-survi
204	PAULEY PETROLEUM	PP	.0068581	B - Non-survi
205	ARAPAHO PETROLEUM	ARHO	.0066660	B - Non-survi
206	MARLIN OIL	MRLNE	.0066591	B - Non-survi
207	PANGEA PETROLEUM	PPET	.0057322	B - Non-survi
208	PARALLEL PETROLEUM	PLLL	.0056509	B - Non-survi
209	KRM PETROLEUM CORPORATION	KRMC	.0049875	B - Non-survi
210	KIRBY EXPLORATION CO INC	KEX	.0041939	B - Non-survi
211	SO. TEXAS DRLG. & EX.	3STXD	.0040455	B - Non-survi
212	TOMLINSON OIL	4566B	.0023458	B - Non-survi

Appendix B
Firm-Specific Efficiency Measures
For Group A (Survivors) and Group C (New Entrants) - 1989-1992

09:38 Sunday September 25, 1994

OBS	NAME	SMBL	EFF	GROUP
1	UNOCAL CORP	UCL	1.00000	A - Survivors
2	BURLINGTON RESOURCES INC	BR	0.98368	C - New Entra
3	ROYAL DUTCH/SHELL GRP COMB	RDSC.CM	0.79527	C - New Entra
4	ORYX ENERGY CO	ORX	0.69887	C - New Entra
5	SOCIETE NATIONALE ELF AQUITAINE	ELF	0.66998	C - New Entra
6	PHILLIPS PETROLEUM CO	P	0.66496	A - Survivors
7	ATLANTIC RICHFIELD CO	ARC	0.61510	A - Survivors
8	BRITISH PETROLEUM PLC -ADR	BP	0.60761	C - New Entra
9	CABOT CORP	CBT	0.57554	A - Survivors
10	MITCHELL ENERGY & DEV	MND	0.49312	A - Survivors
11	ENRON OIL & GAS CO.	EOG	0.48677	C - New Entra
12	THE PHOENIX RESOURCE COMPANIES, INC.	PHNI	0.48501	C - New Entra
13	UNION PACIFIC CORP	UNP	0.47922	A - Survivors
14	SOUTHWESTERN ENERGY CO	SWN	0.47453	A - Survivors
15	USX CORPORATION	MROX.CM	0.47282	C - New Entra
16	EXXON CORP	XON	0.46386	A - Survivors
17	MAXUS ENERGY CORP	MXS	0.43804	C - New Entra
18	TEXACO INC	TX	0.43759	A - Survivors
19	WASHINGTON ENERGY CO	WEG	0.43571	C - New Entra
20	AMOCO CORP	AN	0.42980	A - Survivors
21	CMS ENERGY CORP	CMS	0.41521	A - Survivors
22	KERR-MCGEE CORP	KMG	0.41276	A - Survivors
23	BHP	BHP	0.39783	C - New Entra
24	MOBIL CORP	MOB	0.39020	A - Survivors
25	CONSOLIDATED NATURAL GAS CO	CNG	0.38499	A - Survivors
26	PRESIDIO OIL COMPANY	PRS.B	0.37253	C - New Entra
27	SAGE ENERGY CO.	6041C	0.36118	A - Survivors
28	TOTAL	TOT	0.35472	C - New Entra
29	TRITON ENERGY CORP	OIL	0.35046	A - Survivors
30	NORCEN ENERGY RES	NCN	0.34286	A - Survivors
31	NORTH CANADIAN OILS LTD	NCD	0.34146	A - Survivors
32	HALLWOOD ENERGY CORPORATION	HEP	0.34041	C - New Entra
33	BARRETT RESOURCES CORP	BARC	0.33418	C - New Entra
34	APACHE CORP	APA	0.33102	A - Survivors
35	CHEVRON CORP	CHV	0.32801	A - Survivors
36	ENERGEN CORP	EGN	0.32668	C - New Entra
37	COASTAL CORP	CGP	0.32496	A - Survivors
38	CANADIAN OCCIDENTAL PETRO	CXY	0.32410	A - Survivors
39	BROWN (TOM) INC	TMBR	0.32331	A - Survivors
40	OCCIDENTAL PETROLEUM CORP	OXY	0.32213	A - Survivors

09:38 Sunday September 25, 1994

Appendix B
Firm-Specific Efficiency Measures
For Group A (Survivors) and Group C (New Entrants) - 1989-1992

OBS	NAME	SMBL	EFF	GROUP
41	COLUMBIA GAS SYSTEM	CG	0.31842	A - Survivors
42	DU PONT (E.I.) DE NEMOURS	DD	0.31652	A - Survivors
43	NOBLE AFFILIATES INC	NBL	0.31423	A - Survivors
44	ALEXANDER ENERGY CORP	AEOK	0.30289	A - Survivors
45	ANADARKO PETROLEUM CORP	APC	0.29820	C - New Entra
46	TESORO PETROLEUM CORP	TSO	0.29407	A - Survivors
47	QUESTAR CORP	STR	0.29286	A - Survivors
48	MURPHY OIL CORP	MUR	0.29151	A - Survivors
49	CANADIAN PACIFIC LIMITED	CP	0.28638	A - Survivors
50	BOW VALLEY INDUSTRIES LTD	BVI	0.28323	A - Survivors
51	SONAT INC	SNT	0.28066	A - Survivors
52	PENNZOIL CO	PZL	0.27993	A - Survivors
53	AMERICAN NATIONAL PETROLEUM	ANPC	0.27270	A - Survivors
54	POGO PRODUCING CO	PPP	0.27108	A - Survivors
55	ENSERCH CORP	ENS	0.27082	A - Survivors
56	GARNET RESOURCES CORP	GARN	0.26900	C - New Entra
57	HOME OIL COMPANY LTD.	HO	0.26870	C - New Entra
58	ASHLAND OIL INC	ASH	0.26443	A - Survivors
59	NATIONAL FUEL GAS CO	NFG	0.25426	C - New Entra
60	FINA, INC.	FI	0.25100	C - New Entra
61	NICOR INC	GAS	0.24200	A - Survivors
62	LOUISIANA LAND & EXPLORATION	LLX	0.24110	A - Survivors
63	MESA INC.	MXP	0.24016	C - New Entra
64	EQUITABLE RESOURCES INC	EQT	0.23963	A - Survivors
65	MONTANA POWER CO	MTP	0.23155	A - Survivors
66	SCEPTRE RESOURCES LTD	SRL	0.22436	C - New Entra
67	EDISTO RESOURCES CP	EDS	0.22311	C - New Entra
68	NAHAMA & WEAGANT ENERGY COMPANY	NAWE	0.21735	C - New Entra
69	KCS ENERGY, INC.	KCSE	0.21021	C - New Entra
70	HELMERICH & PAYNE	HP	0.19833	A - Survivors
71	AMERADA HESS CORP	AHC	0.19758	A - Survivors
72	BRITISH GAS	BRG	0.19711	C - New Entra
73	WAINOCO OIL CORP	WOL	0.19365	A - Survivors
74	GULF CANADA RES LTD -ORD	GOU	0.19144	C - New Entra
75	WISER OIL CO	WISE	0.19025	A - Survivors
76	DEKALB ENERGY CO -CL B	ENRGB	0.18974	A - Survivors
77	PRAIRIE OIL ROYALTIES CO LTD	POY	0.18889	A - Survivors
78	NEW LONDON INC	NLON	0.18541	C - New Entra
79	SEAGULL ENERGY CORP	SGO	0.18260	C - New Entra
80	UNIT CORP	UNT	0.17277	A - Survivors

Appendix B
Firm-Specific Efficiency Measures
For Group A (Survivors) and Group C (New Entrants) - 1989-1992

09:38 Sunday September 25, 1994

OBS	NAME	SMBL	EFF	GROUP
81	ONEOK INC	OKE	0.17139	A - Survivors
82	SUN CO INC	SUN	0.16619	A - Survivors
83	SWIFT ENERGY CO	SFY	0.16545	C - New Entra
84	AMERICAN EXPLORATION CO	AX	0.16219	A - Survivors
85	BARNWELL INDUSTRIES	BRN	0.14830	C - New Entra
86	RANGER OIL LTD	RGO	0.13207	A - Survivors
87	GLOBAL NATURAL RESOURCES INC	GNR	0.12144	C - New Entra
88	BOX ENERGY CORPORATION	BOXXA	0.11805	C - New Entra
89	SANTA FE ENERGY RESOURCES	SFR	0.11780	C - New Entra
90	BASIC EARTH SCIENCE SYSTEMS	3BSIC	0.11712	C - New Entra
91	NUMAC OIL & GAS LTD	NMC	0.11247	A - Survivors
92	PLAINS PETROLEUM COMPANY	PLP	0.11037	C - New Entra
93	MDU RESOURCES GROUP INC	MDU	0.10926	C - New Entra
94	REPSOL, S.A.	REP	0.10916	C - New Entra
95	CRYSTAL OIL CO	COR	0.10429	A - Survivors
96	PENN VIRGINIA CORPORATION	PVIR	0.10357	C - New Entra
97	SNYDER OIL CORP	SNY	0.09515	C - New Entra
98	COHO RESOURCES, INC.	COHO	0.09514	C - New Entra
99	WILSHIRE OIL OF TEXAS	WOC	0.09198	A - Survivors
100	EXPLORATION CO OF LOUISIANA	XCL	0.09072	C - New Entra
101	MCFARLAND ENERGY INC	MCFE	0.08707	A - Survivors
102	PLAINS RESOURCES INC	PLX	0.08501	A - Survivors
103	PRIMEENERGY CORPORATION	PNRG	0.07944	C - New Entra
104	PATRICK PETROLEUM CO	PPC	0.07761	C - New Entra
105	MAYNARD OIL CO	MOIL	0.07578	A - Survivors
106	BELLWETHER EXPLORATION CO	BELW	0.07295	C - New Entra
107	DEVON ENERGY CORPORATION	DVN	0.07258	C - New Entra
108	CONVEST ENERGY PARTNERS -LP	COV	0.06507	C - New Entra
109	HOWELL CORP	HWL	0.06408	A - Survivors
110	EQUITY OIL CO	EQTY	0.06208	A - Survivors
111	FOREST OIL CORP	FOIL	0.05908	A - Survivors
112	HONDO OIL & GAS CO	HOG	0.05471	C - New Entra
113	ALLEGHENY & WESTERN ENERGY	ALGH	0.04197	A - Survivors
114	BROCK EXPLORATION CORP	BKE	0.03792	A - Survivors
115	VINTAGE PETROLEUM, INC.	VPI	0.03505	C - New Entra
116	HADSON ENERGY RESOURCES CORPORATION	HERC	0.03501	C - New Entra
117	UNION TEXAS PETRO HLDGS INC	UTH	0.02806	C - New Entra
118	RESOURCE AMERICA INC.	REXID	0.01250	C - New Entra
119	BEARD OIL CO	BOC	0.00873	A - Survivors

APPENDIX C
MEAN EFFICIENCY MEASURES

Appendix C
Mean Efficiency Measures
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985

09:38 Sunday September 25, 1994

Analysis Variable : EFF

----- GROUP=B- Non-survivors-----

N	Mean	Std Dev	Minimum	Maximum
146	0.0680822	0.0851479	0.0023458	0.6000051

----- GROUP=A - Survivors -----

N	Mean	Std Dev	Minimum	Maximum
66	0.1473796	0.1602076	0.0147193	1.0000000

Appendix C
Mean Efficiency Measures
For Group A (Survivors) and Group C (New Entrants) - 1989-1992

09:38 Sunday September 25, 1994

Analysis Variable : EFF

----- GROUP=A - Survivors -----

N	Mean	Std Dev	Minimum	Maximum
66	0.2829380	0.1679490	0.0087338	1.0000000

----- GROUP=C - New Entrants-----

N	Mean	Std Dev	Minimum	Maximum
53	0.2537273	0.2100844	0.0124997	0.9836801

09:38 Sunday September 25, 1994

Appendix C
 Test of Difference in Mean Efficiency
 For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
 Intercept Defined as Group B Mean Efficiency

Model: MODEL1

Dependent Variable: EFF

EFFICIENCY MEASURE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	0.85743	0.85743	66.629	0.0001
Error	210	8.15878	0.01287		
C Total	211	9.01622			

Root MSE	0.11344	R-square	0.0951
Dep Mean	0.09277	Adj R-sq	0.0937
C.V.	122.28258		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T	Variable Label
INTERCEP	1	0.068082	0.00542040	12.560	0.0001	Intercept
GROUPA	1	0.079297	0.00971465	8.163	0.0001	DUMMY VARIABLE INDICATING GROUP A

Appendix C
 Test of Difference in Mean Efficiency
 For Group A (Survivors) and Group C (New Entrants) - 1989-1992
 Intercept Defined as Group C Mean Efficiency

09:38 Sunday September 25, 1994

Model: MODEL1

Dependent Variable: EFF

EFFICIENCY MEASURE

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	1	0.07524	0.07524	2.157	0.1428
Error	117	12.38547	0.03489		
C Total	118	12.46071			
Root MSE		0.18679	R-square	0.0060	
Dep Mean		0.26993	Adj R-sq	0.0032	
C.V.		69.19805			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > T	Variable Label
INTERCEP	1	0.253727	0.01481302	17.129	0.0001	Intercept
GROUPA	1	0.029211	0.01989047	1.469	0.1428	DUMMY VARIABLE INDICATING GROUP A

APPENDIX D

SPEARMAN AND PEARSON PRODUCT MOMENT CORRELATION COEFFICIENTS

BETWEEN INVERSE FINDING COSTS

AND FIRM-SPECIFIC EFFICIENCY MEASURE

ANALYSIS POOLING ACROSS YEARS

Appendix D
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
Analysis Across Years

17:51 Sunday, September 25, 1994 59

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum	Label
EFF	636	0.09277	0.11916	0.05627	0.00235	1.00000	EFFICIENCY MEASURE
IFC1	636	1.07128	5.91587	0.24467	0.00144	128.50000	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	636	0.50869	1.14172	0.23926	0.01370	20.70370	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	636	0.38417	6.83670	0.22962	-130.15385	66.08333	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	636	0.35085	1.11260	0.20902	-9.67640	13.60435	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	636	0.15195	0.31897	0.09576	0.00122	6.94595	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	636	0.13176	0.12291	0.10180	0.00572	1.16823	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	636	0.07426	0.51674	0.10001	-6.86338	3.57207	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	636	0.09475	0.19887	0.09294	-2.34284	1.51139	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix D
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
Analysis Across Years

17:51 Sunday, September 25, 1994 60

Correlation Analysis

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 636

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF	1.00000	0.16595	0.09269	0.24498	0.30164	0.20723	0.09722	0.25776	0.32617
EFFICIENCY MEASURE	0.0	0.0001	0.0194	0.0001	0.0001	0.0001	0.0142	0.0001	0.0001
IFC1	0.16595	1.00000	0.71498	0.57692	0.46893	0.85441	0.61362	0.42871	0.34486
INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3	0.09269	0.71498	1.00000	0.31022	0.54997	0.57134	0.87097	0.15709	0.37807
INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.0194	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
IFC1R	0.24498	0.57692	0.31022	1.00000	0.56774	0.53547	0.23339	0.90920	0.52866
INV. 1-YR FND CSTS W/EXP INCL. REV.	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3R	0.30164	0.46893	0.54997	0.56774	1.00000	0.37698	0.46040	0.48535	0.90632
INV. 3-YR FND CSTS W/EXP INCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001
IFC1D	0.20723	0.85441	0.57134	0.53547	0.37698	1.00000	0.63799	0.53120	0.35991
INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001
IFC3D	0.09722	0.61362	0.87097	0.23339	0.46040	0.63799	1.00000	0.18104	0.44050
INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0142	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001
IFC1RD	0.25776	0.42871	0.15709	0.90920	0.48535	0.53120	0.18104	1.00000	0.53485
INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.0001
IFC3RD	0.32617	0.34486	0.37807	0.52866	0.90632	0.35991	0.44050	0.53485	1.00000
INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0

Appendix D
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group C (New Entrants) - 1989-1992
Analysis Across Years

17:51 Sunday, September 25, 1994 61

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum	Label
EFF	357	0.26993	0.18709	0.25100	0.00873	1.00000	EFFICIENCY MEASURE
IFC1	357	0.81289	2.10787	0.36104	0.00081481	29.05814	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	357	0.61257	0.64950	0.39711	0.01465	4.77190	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	357	0.77304	2.64699	0.43232	-22.30000	25.68992	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	357	0.76868	1.00249	0.50849	-1.24671	8.58735	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	357	0.17410	0.18090	0.12644	0.00019880	1.63266	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	357	0.16784	0.10019	0.14926	0.00447	0.72776	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	357	0.18430	0.32098	0.15366	-1.30152	2.40739	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	357	0.20142	0.16718	0.17843	-0.41557	1.39652	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix D
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group C (New Entrants) - 1989-1992
Analysis Across Years

17:51 Sunday, September 25, 1994 62

Correlation Analysis

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 357

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF	1.00000	0.36216	0.30754	0.34803	0.32612	0.41947	0.41074	0.37091	0.42158
EFFICIENCY MEASURE	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
IFC1	0.36216	1.00000	0.77292	0.70113	0.62993	0.81118	0.65477	0.53428	0.51394
INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3	0.30754	0.77292	1.00000	0.51550	0.72722	0.53582	0.77825	0.30394	0.53028
INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
IFC1R	0.34803	0.70113	0.51550	1.00000	0.68802	0.50315	0.33605	0.84132	0.58735
INV. 1-YR FND CSTS W/EXP INCL. REV.	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3R	0.32612	0.62993	0.72722	0.68802	1.00000	0.36571	0.44269	0.49603	0.81132
INV. 3-YR FND CSTS W/EXP INCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001
IFC1D	0.41947	0.81118	0.53582	0.50315	0.36571	1.00000	0.72746	0.61229	0.49730
INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001
IFC3D	0.41074	0.65477	0.77825	0.33605	0.44269	0.72746	1.00000	0.36480	0.57239
INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001
IFC1RD	0.37091	0.53428	0.30394	0.84132	0.49603	0.61229	0.36480	1.00000	0.63313
INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.0001
IFC3RD	0.42158	0.51394	0.53028	0.58735	0.81132	0.49730	0.57239	0.63313	1.00000
INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0

Appendix D
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
 Analysis Across Years

17:51 Sunday, September 25, 1994 63

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
EFF	636	0.09277	0.11916	59.00117	0.00235	1.00000	EFFICIENCY MEASURE
IFC1	636	1.07128	5.91587	681.33431	0.00144	128.50000	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	636	0.50869	1.14172	323.52780	0.01370	20.70370	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	636	0.38417	6.83670	244.32950	-130.15385	66.08333	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	636	0.35085	1.11260	223.14360	-9.67640	13.60435	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	636	0.15195	0.31897	96.63917	0.00122	6.94595	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	636	0.13176	0.12291	83.79798	0.00572	1.16823	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	636	0.07426	0.51674	47.23060	-6.86338	3.57207	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	636	0.09475	0.19887	60.26042	-2.34284	1.51139	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix D
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
 Analysis Across Years

17:51 Sunday, September 25, 1994 64

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 636

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF	1.00000	-0.03329	-0.04161	-0.01702	0.02015	-0.02860	-0.04131	0.03261	0.08463
EFFICIENCY MEASURE	0.0	0.4019	0.2947	0.6684	0.6119	0.4716	0.2982	0.4116	0.0328
IFC1	-0.03329	1.00000	0.77591	0.32621	0.44328	0.82695	0.43315	0.26523	0.14859
INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.4019	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002
IFC3	-0.04161	0.77591	1.00000	0.29157	0.63392	0.74321	0.70924	0.13792	0.24259
INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.2947	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0005	0.0001
IFC1R	-0.01702	0.32621	0.29157	1.00000	0.36002	0.38153	0.16962	0.41579	0.26525
INV. 1-YR FND CSTS W/EXP INCL. REV.	0.6684	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3R	0.02015	0.44328	0.63392	0.36002	1.00000	0.35887	0.41721	0.53777	0.77557
INV. 3-YR FND CSTS W/EXP INCL. REV.	0.6119	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001
IFC1D	-0.02860	0.82695	0.74321	0.38153	0.35887	1.00000	0.55092	0.29490	0.14184
INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.4716	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0003
IFC3D	-0.04131	0.43315	0.70924	0.16962	0.41721	0.55092	1.00000	-0.07443	0.25672
INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.2982	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.0607	0.0001
IFC1RD	0.03261	0.26523	0.13792	0.41579	0.53777	0.29490	-0.07443	1.00000	0.61109
INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.4116	0.0001	0.0005	0.0001	0.0001	0.0001	0.0607	0.0	0.0001
IFC3RD	0.08463	0.14859	0.24259	0.26525	0.77557	0.14184	0.25672	0.61109	1.00000
INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.0328	0.0002	0.0001	0.0001	0.0001	0.0003	0.0001	0.0001	0.0

Appendix D
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group C (New Entrants) - 1989-1992
 Analysis Across Years

17:51 Sunday, September 25, 1994 65

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
EFF	357	0.26993	0.18709	96.36436	0.00873	1.00000	EFFICIENCY MEASURE
IFC1	357	0.81289	2.10787	290.20329	0.00081481	29.05814	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	357	0.61257	0.64950	218.68697	0.01465	4.77190	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	357	0.77304	2.64699	275.97375	-22.30000	25.68992	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	357	0.76868	1.00249	274.41913	-1.24671	8.58735	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	357	0.17410	0.18090	62.15322	0.00019880	1.63266	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	357	0.16784	0.10019	59.91721	0.00447	0.72776	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	357	0.18430	0.32098	65.79584	-1.30152	2.40739	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	357	0.20142	0.16718	71.90617	-0.41557	1.39652	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix D
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group C (New Entrants) - 1989-1992
 Analysis Across Years

17:51 Sunday, September 25, 1994 66

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 357

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF EFFICIENCY MEASURE	1.00000 0.0	0.09535 0.0720	0.14355 0.0066	0.13697 0.0096	0.09694 0.0673	0.26354 0.0001	0.34737 0.0001	0.24442 0.0001	0.30788 0.0001
IFC1 INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.09535 0.0720	1.00000 0.0	0.58109 0.0001	0.65151 0.0001	0.31510 0.0001	0.52365 0.0001	0.35758 0.0001	0.27514 0.0001	0.19005 0.0003
IFC3 INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.14355 0.0066	0.58109 0.0001	1.00000 0.0	0.37753 0.0001	0.69683 0.0001	0.44944 0.0001	0.59066 0.0001	0.22253 0.0001	0.36343 0.0001
IFC1R INV. 1-YR FND CSTS W/EXP INCL. REV.	0.13697 0.0096	0.65151 0.0001	0.37753 0.0001	1.00000 0.0	0.44242 0.0001	0.42068 0.0001	0.24299 0.0001	0.62320 0.0001	0.39873 0.0001
IFC3R INV. 3-YR FND CSTS W/EXP INCL. REV.	0.09694 0.0673	0.31510 0.0001	0.69683 0.0001	0.44242 0.0001	1.00000 0.0	0.31024 0.0001	0.33668 0.0001	0.39768 0.0001	0.64047 0.0001
IFC1D INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.26354 0.0001	0.52365 0.0001	0.44944 0.0001	0.42068 0.0001	0.31024 0.0001	1.00000 0.0	0.72409 0.0001	0.66674 0.0001	0.52064 0.0001
IFC3D INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.34737 0.0001	0.35758 0.0001	0.59066 0.0001	0.24299 0.0001	0.33668 0.0001	0.72409 0.0001	1.00000 0.0	0.37821 0.0001	0.53978 0.0001
IFC1RD INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.24442 0.0001	0.27514 0.0001	0.22253 0.0001	0.62320 0.0001	0.39768 0.0001	0.66674 0.0001	0.37821 0.0001	1.00000 0.0	0.69702 0.0001
IFC3RD INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.30788 0.0001	0.19005 0.0003	0.36343 0.0001	0.39873 0.0001	0.64047 0.0001	0.52064 0.0001	0.53978 0.0001	0.69702 0.0001	1.00000 0.0

APPENDIX E
SPEARMAN AND PEARSON PRODUCT MOMENT CORRELATION COEFFICIENTS
BETWEEN INVERSE FINDING COSTS
AND FIRM-SPECIFIC EFFICIENCY MEASURE
ANALYSIS YEAR-BY-YEAR

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Appendix E
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
Analysis By Year

----- YEAR=83 -----

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum	Label
EFF	212	0.09277	0.11935	0.05627	0.00235	1.00000	EFFICIENCY MEASURE
IFC1	212	0.56113	1.09954	0.24206	0.01055	8.21083	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	212	0.47951	0.82599	0.24224	0.01370	7.83708	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	212	0.25631	1.68745	0.23765	-13.30195	10.27444	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	212	0.38587	0.68317	0.20476	-1.00943	4.33663	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	212	0.13048	0.12252	0.10343	0.00311	0.82873	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	212	0.13112	0.12307	0.09842	0.00572	1.04001	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	212	0.07390	0.36763	0.10747	-4.24214	1.17368	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	212	0.10789	0.12953	0.08973	-0.50540	0.74520	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix E
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
Analysis By Year

----- YEAR=83 -----

Correlation Analysis

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 212

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF	1.00000	0.10255	0.01867	0.26592	0.19164	0.14181	-0.01322	0.28135	0.20597
EFFICIENCY MEASURE	0.0	0.1367	0.7870	0.0001	0.0051	0.0391	0.8483	0.0001	0.0026
IFC1	0.10255	1.00000	0.73884	0.54079	0.57692	0.83502	0.63147	0.39051	0.44585
INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.1367	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3	0.01867	0.73884	1.00000	0.28021	0.66086	0.57736	0.88832	0.12095	0.50260
INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.7870	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0789	0.0001
IFC1R	0.26592	0.54079	0.28021	1.00000	0.52763	0.52305	0.13749	0.89668	0.44698
INV. 1-YR FND CSTS W/EXP INCL. REV.	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0456	0.0001	0.0001
IFC3R	0.19164	0.57692	0.66086	0.52763	1.00000	0.45093	0.54582	0.41739	0.90223
INV. 3-YR FND CSTS W/EXP INCL. REV.	0.0051	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001
IFC1D	0.14181	0.83502	0.57736	0.52305	0.45093	1.00000	0.61248	0.54711	0.44180
INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0391	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001
IFC3D	-0.01322	0.63147	0.88832	0.13749	0.54582	0.61248	1.00000	0.07089	0.53673
INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.8483	0.0001	0.0001	0.0456	0.0001	0.0001	0.0	0.3043	0.0001
IFC1RD	0.28135	0.39051	0.12095	0.89668	0.41739	0.54711	0.07089	1.00000	0.43868
INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.0001	0.0001	0.0789	0.0001	0.0001	0.0001	0.3043	0.0	0.0001
IFC3RD	0.20597	0.44585	0.50260	0.44698	0.90223	0.44180	0.53673	0.43868	1.00000
INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.0026	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0

Appendix E
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
Analysis By Year

17:51 Sunday, September 25, 1994 37

----- YEAR=84 -----

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum	Label
EFF	212	0.09277	0.11935	0.05627	0.00235	1.00000	EFFICIENCY MEASURE
IFC1	212	0.92626	3.50066	0.22829	0.00144	46.31727	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	212	0.43189	0.62247	0.22884	0.02071	5.48864	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	212	0.99947	3.96913	0.22275	-4.10151	43.58434	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	212	0.36730	0.84016	0.20596	-1.78176	8.41572	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	212	0.14762	0.17671	0.09699	0.00122	1.39231	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	212	0.12944	0.12001	0.09951	0.01430	0.98571	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	212	0.12400	0.35784	0.09818	-2.87737	2.41624	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	212	0.10479	0.16240	0.09361	-0.88176	1.51139	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix E
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
Analysis By Year

17:51 Sunday, September 25, 1994 38

----- YEAR=84 -----

Correlation Analysis

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 212

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF	1.00000	0.16167	0.11440	0.24552	0.34841	0.17224	0.10262	0.24664	0.38848
EFFICIENCY MEASURE	0.0	0.0185	0.0967	0.0003	0.0001	0.0120	0.1364	0.0003	0.0001
IFC1	0.16167	1.00000	0.64309	0.68631	0.44713	0.86707	0.54955	0.49519	0.32471
INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.0185	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3	0.11440	0.64309	1.00000	0.32555	0.59195	0.52496	0.86660	0.13601	0.40155
INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.0967	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0479	0.0001
IFC1R	0.24552	0.68631	0.32555	1.00000	0.52842	0.58997	0.25439	0.89201	0.48755
INV. 1-YR FND CSTS W/EXP INCL. REV.	0.0003	0.0001	0.0001	0.0	0.0001	0.0001	0.0002	0.0001	0.0001
IFC3R	0.34841	0.44713	0.59195	0.52842	1.00000	0.35985	0.46819	0.41428	0.89772
INV. 3-YR FND CSTS W/EXP INCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001
IFC1D	0.17224	0.86707	0.52496	0.58997	0.35985	1.00000	0.59151	0.53683	0.31851
INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0120	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001
IFC3D	0.10262	0.54955	0.86660	0.25439	0.46819	0.59151	1.00000	0.17129	0.43777
INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.1364	0.0001	0.0001	0.0002	0.0001	0.0001	0.0	0.0125	0.0001
IFC1RD	0.24664	0.49519	0.13601	0.89201	0.41428	0.53683	0.17129	1.00000	0.46858
INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.0003	0.0001	0.0479	0.0001	0.0001	0.0001	0.0125	0.0	0.0001
IFC3RD	0.38848	0.32471	0.40155	0.48755	0.89772	0.31851	0.43777	0.46858	1.00000
INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0

Appendix E
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
Analysis By Year

17:51 Sunday, September 25, 1994 39

----- YEAR=85 -----

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum	Label
EFF	212	0.09277	0.11935	0.05627	0.00235	1.00000	EFFICIENCY MEASURE
IFC1	212	1.72645	9.54709	0.25974	0.01033	128.50000	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	212	0.61468	1.68379	0.24549	0.01471	20.70370	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	212	-0.10328	11.01940	0.21521	-130.15385	66.08333	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	212	0.29939	1.59644	0.21153	-9.67640	13.60435	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	212	0.17775	0.50872	0.09191	0.00292	6.94595	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	212	0.13471	0.12609	0.10538	0.00989	1.16823	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	212	0.02489	0.73174	0.09479	-6.86338	3.57207	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	212	0.07157	0.27396	0.09556	-2.34284	1.32697	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix E
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
Analysis By Year

17:51 Sunday, September 25, 1994 40

----- YEAR=85 -----

Correlation Analysis

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 212

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF	1.00000	0.24318	0.15455	0.23060	0.35636	0.30878	0.20399	0.24401	0.37900
EFFICIENCY MEASURE	0.0	0.0004	0.0244	0.0007	0.0001	0.0001	0.0028	0.0003	0.0001
IFC1	0.24318	1.00000	0.76238	0.50199	0.40158	0.85971	0.65960	0.39840	0.28670
INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.0004	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3	0.15455	0.76238	1.00000	0.32738	0.40857	0.62023	0.84960	0.21289	0.24722
INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.0244	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0018	0.0003
IFC1R	0.23060	0.50199	0.32738	1.00000	0.64949	0.49519	0.30983	0.93468	0.64864
INV. 1-YR FND CSTS W/EXP INCL. REV.	0.0007	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3R	0.35636	0.40158	0.40857	0.64949	1.00000	0.33672	0.36878	0.61446	0.91842
INV. 3-YR FND CSTS W/EXP INCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001
IFC1D	0.30878	0.85971	0.62023	0.49519	0.33672	1.00000	0.71437	0.50249	0.33736
INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001
IFC3D	0.20399	0.65960	0.84960	0.30983	0.36878	0.71437	1.00000	0.29527	0.35075
INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0028	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001
IFC1RD	0.24401	0.39840	0.21289	0.93468	0.61446	0.50249	0.29527	1.00000	0.68191
INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.0003	0.0001	0.0018	0.0001	0.0001	0.0001	0.0001	0.0	0.0001
IFC3RD	0.37900	0.28670	0.24722	0.64864	0.91842	0.33736	0.35075	0.68191	1.00000
INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.0001	0.0001	0.0003	0.0001	0.0001	0.0001	0.0001	0.0001	0.0

Appendix E
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group C (New Entrants) - 1989-1992
Analysis By Year

17:51 Sunday, September 25, 1994 41

----- YEAR=90 -----

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum	Label
EFF	119	0.26993	0.18762	0.25100	0.00873	1.00000	EFFICIENCY MEASURE
IFC1	119	0.79216	1.78106	0.36920	0.00450	18.68301	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	119	0.63950	0.68873	0.38808	0.03101	4.77190	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	119	0.98887	1.82379	0.47746	-0.85497	15.04575	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	119	0.91094	1.24330	0.54796	-0.29491	8.58735	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	119	0.18091	0.13060	0.13780	0.00303	0.74072	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	119	0.17419	0.10602	0.15351	0.01624	0.59069	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	119	0.23033	0.25632	0.17705	-0.19099	2.11141	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	119	0.23058	0.18048	0.19352	-0.25259	1.37928	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix E
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group C (New Entrants) - 1989-1992
Analysis By Year

17:51 Sunday, September 25, 1994 42

----- YEAR=90 -----

Correlation Analysis

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 119

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF	1.00000	0.23527	0.14804	0.29755	0.22315	0.38629	0.31461	0.42060	0.31478
EFFICIENCY MEASURE	0.0	0.0100	0.1081	0.0010	0.0147	0.0001	0.0005	0.0001	0.0005
IFC1	0.23527	1.00000	0.83202	0.70998	0.70902	0.73205	0.70140	0.51804	0.60211
INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.0100	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3	0.14804	0.83202	1.00000	0.54527	0.76338	0.52196	0.74978	0.30073	0.59755
INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.1081	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0009	0.0001
IFC1R	0.29755	0.70998	0.54527	1.00000	0.71774	0.43754	0.35195	0.79714	0.66874
INV. 1-YR FND CSTS W/EXP INCL. REV.	0.0010	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3R	0.22315	0.70902	0.76338	0.71774	1.00000	0.33921	0.48154	0.48408	0.84730
INV. 3-YR FND CSTS W/EXP INCL. REV.	0.0147	0.0001	0.0001	0.0001	0.0	0.0002	0.0001	0.0001	0.0001
IFC1D	0.38629	0.73205	0.52196	0.43754	0.33921	1.00000	0.80105	0.62826	0.49554
INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0002	0.0	0.0001	0.0001	0.0001
IFC3D	0.31461	0.70140	0.74978	0.35195	0.48154	0.80105	1.00000	0.41577	0.59709
INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0005	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001
IFC1RD	0.42060	0.51804	0.30073	0.79714	0.48408	0.62826	0.41577	1.00000	0.66666
INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.0001	0.0001	0.0009	0.0001	0.0001	0.0001	0.0001	0.0	0.0001
IFC3RD	0.31478	0.60211	0.59755	0.66874	0.84730	0.49554	0.59709	0.66666	1.00000
INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.0005	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0

Appendix E
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group C (New Entrants) - 1989-1992
Analysis By Year

17:51 Sunday, September 25, 1994 43

----- YEAR=91 -----

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum	Label
EFF	119	0.26993	0.18762	0.25100	0.00873	1.00000	EFFICIENCY MEASURE
IFC1	119	0.55615	0.73075	0.34801	0.02671	6.10383	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	119	0.58532	0.56698	0.39926	0.03811	3.27976	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	119	0.57925	1.26608	0.33244	-3.54386	9.18557	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	119	0.73327	0.89182	0.50094	-0.09482	6.21837	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	119	0.16038	0.15317	0.11336	0.00490	0.93860	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	119	0.16755	0.09293	0.14516	0.01202	0.46598	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	119	0.15463	0.29954	0.13116	-0.79216	2.10794	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	119	0.19915	0.13745	0.17352	-0.06854	0.86408	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix E
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group C (New Entrants) - 1989-1992
Analysis By Year

17:51 Sunday, September 25, 1994 44

----- YEAR=91 -----

Correlation Analysis

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 119

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF	1.00000	0.37004	0.34335	0.30846	0.31139	0.38938	0.41966	0.32888	0.41261
EFFICIENCY MEASURE	0.0	0.0001	0.0001	0.0006	0.0006	0.0001	0.0001	0.0003	0.0001
IFC1	0.37004	1.00000	0.70224	0.61980	0.51453	0.84306	0.66325	0.51215	0.42991
INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3	0.34335	0.70224	1.00000	0.45821	0.70030	0.49617	0.79523	0.28360	0.46863
INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0018	0.0001
IFC1R	0.30846	0.61980	0.45821	1.00000	0.53569	0.46932	0.32521	0.87082	0.47159
INV. 1-YR FND CSTS W/EXP INCL. REV.	0.0006	0.0001	0.0001	0.0	0.0001	0.0001	0.0003	0.0001	0.0001
IFC3R	0.31139	0.51453	0.70030	0.53569	1.00000	0.28719	0.40642	0.39132	0.77177
INV. 3-YR FND CSTS W/EXP INCL. REV.	0.0006	0.0001	0.0001	0.0001	0.0	0.0015	0.0001	0.0001	0.0001
IFC1D	0.38938	0.84306	0.49617	0.46932	0.28719	1.00000	0.71037	0.56720	0.43796
INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0015	0.0	0.0001	0.0001	0.0001
IFC3D	0.41966	0.66325	0.79523	0.32521	0.40642	0.71037	1.00000	0.36062	0.53985
INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0001	0.0001	0.0001	0.0003	0.0001	0.0001	0.0	0.0001	0.0001
IFC1RD	0.32888	0.51215	0.28360	0.87082	0.39132	0.56720	0.36062	1.00000	0.57628
INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.0003	0.0001	0.0018	0.0001	0.0001	0.0001	0.0001	0.0	0.0001
IFC3RD	0.41261	0.42991	0.46863	0.47159	0.77177	0.43796	0.53985	0.57628	1.00000
INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0

Appendix E
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group C (New Entrants) - 1989-1992
Analysis By Year

17:51 Sunday, September 25, 1994 45

----- YEAR=92 -----

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum	Label
EFF	119	0.26993	0.18762	0.25100	0.00873	1.00000	EFFICIENCY MEASURE
IFC1	119	1.09037	3.09093	0.36608	0.00081481	29.05814	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	119	0.61288	0.68948	0.39711	0.01465	4.52686	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	119	0.75099	4.01546	0.46933	-22.30000	25.68992	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	119	0.66183	0.81096	0.45884	-1.24671	4.97810	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	119	0.18102	0.24067	0.12691	0.00019880	1.63266	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	119	0.16176	0.10163	0.14160	0.00447	0.72776	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	119	0.16795	0.39002	0.14966	-1.30152	2.40739	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	119	0.17453	0.17680	0.15904	-0.41557	1.39652	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix E
Spearman Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group C (New Entrants) - 1989-1992
Analysis By Year

17:51 Sunday, September 25, 1994 46

----- YEAR=92 -----

Correlation Analysis

Spearman Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 119

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF	1.00000	0.48032	0.43801	0.43010	0.43563	0.50921	0.50279	0.37964	0.53781
EFFICIENCY MEASURE	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
IFC1	0.48032	1.00000	0.79212	0.75513	0.64781	0.83958	0.61189	0.55979	0.51395
INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3	0.43801	0.79212	1.00000	0.55468	0.70707	0.60310	0.78975	0.33618	0.53441
INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001
IFC1R	0.43010	0.75513	0.55468	1.00000	0.78733	0.56985	0.33148	0.84769	0.63410
INV. 1-YR FND CSTS W/EXP INCL. REV.	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0002	0.0001	0.0001
IFC3R	0.43563	0.64781	0.70707	0.78733	1.00000	0.42238	0.41562	0.58322	0.80783
INV. 3-YR FND CSTS W/EXP INCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001
IFC1D	0.50921	0.83958	0.60310	0.56985	0.42238	1.00000	0.68583	0.61048	0.53132
INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001
IFC3D	0.50279	0.61189	0.78975	0.33148	0.41562	0.68583	1.00000	0.31510	0.57031
INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	0.0	0.0005	0.0001
IFC1RD	0.37964	0.55979	0.33618	0.84769	0.58322	0.61048	0.31510	1.00000	0.64596
INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.0001	0.0001	0.0002	0.0001	0.0001	0.0001	0.0005	0.0	0.0001
IFC3RD	0.53781	0.51395	0.53441	0.63410	0.80783	0.53132	0.57031	0.64596	1.00000
INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0

Appendix E
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
 Analysis By Year

17:51 Sunday, September 25, 1994 47

----- YEAR=83 -----

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
EFF	212	0.09277	0.11935	19.66706	0.00235	1.00000	EFFICIENCY MEASURE
IFC1	212	0.56113	1.09954	118.95915	0.01055	8.21083	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	212	0.47951	0.82599	101.65643	0.01370	7.83708	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	212	0.25631	1.68745	54.33767	-13.30195	10.27444	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	212	0.38587	0.68317	81.80404	-1.00943	4.33663	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	212	0.13048	0.12252	27.66188	0.00311	0.82873	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	212	0.13112	0.12307	27.79805	0.00572	1.04001	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	212	0.07390	0.36763	15.66718	-4.24214	1.17368	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	212	0.10789	0.12953	22.87193	-0.50540	0.74520	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix E
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
 Analysis By Year

17:51 Sunday, September 25, 1994 48

----- YEAR=83 -----

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 212

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF	1.00000	-0.04480	-0.05768	0.03641	-0.01764	-0.00243	-0.07613	0.04610	0.06327
EFFICIENCY MEASURE	0.0	0.5165	0.4034	0.5981	0.7985	0.9719	0.2698	0.5044	0.3593
IFC1	-0.04480	1.00000	0.53625	0.26399	0.44380	0.62876	0.34962	-0.05522	0.21597
INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.5165	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.4238	0.0016
IFC3	-0.05768	0.53625	1.00000	0.12421	0.76751	0.30783	0.63556	-0.16861	0.36268
INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.4034	0.0001	0.0	0.0711	0.0001	0.0001	0.0001	0.0140	0.0001
IFC1R	0.03641	0.26399	0.12421	1.00000	0.33642	-0.06896	-0.30201	0.75848	0.10572
INV. 1-YR FND CSTS W/EXP INCL. REV.	0.5981	0.0001	0.0711	0.0	0.0001	0.3176	0.0001	0.0001	0.1249
IFC3R	-0.01764	0.44380	0.76751	0.33642	1.00000	0.27016	0.47510	0.05632	0.70948
INV. 3-YR FND CSTS W/EXP INCL. REV.	0.7985	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.4146	0.0001
IFC1D	-0.00243	0.62876	0.30783	-0.06896	0.27016	1.00000	0.54081	-0.15173	0.38444
INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.9719	0.0001	0.0001	0.3176	0.0001	0.0	0.0001	0.0272	0.0001
IFC3D	-0.07613	0.34962	0.63556	-0.30201	0.47510	0.54081	1.00000	-0.42913	0.57447
INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.2698	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001
IFC1RD	0.04610	-0.05522	-0.16861	0.75848	0.05632	-0.15173	-0.42913	1.00000	0.05371
INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.5044	0.4238	0.0140	0.0001	0.4146	0.0272	0.0001	0.0	0.4366
IFC3RD	0.06327	0.21597	0.36268	0.10572	0.70948	0.38444	0.57447	0.05371	1.00000
INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.3593	0.0016	0.0001	0.1249	0.0001	0.0001	0.0001	0.4366	0.0

Appendix E
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
 Analysis By Year

17:51 Sunday, September 25, 1994 49

----- YEAR=84 -----

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
EFF	212	0.09277	0.11935	19.66706	0.00235	1.00000	EFFICIENCY MEASURE
IFC1	212	0.92626	3.50066	196.36680	0.00144	46.31727	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	212	0.43189	0.62247	91.56007	0.02071	5.48864	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	212	0.99947	3.96913	211.88777	-4.10151	43.58434	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	212	0.36730	0.84016	77.86783	-1.78176	8.41572	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	212	0.14762	0.17671	31.29470	0.00122	1.39231	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	212	0.12944	0.12001	27.44059	0.01430	0.98571	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	212	0.12400	0.35784	26.28757	-2.87737	2.41624	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	212	0.10479	0.16240	22.21462	-0.88176	1.51139	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix E
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
 Analysis By Year

17:51 Sunday, September 25, 1994 50

----- YEAR=84 -----

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 212

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF EFFICIENCY MEASURE	1.00000 0.0	-0.01015 0.8832	-0.02399 0.7284	-0.00996 0.8853	0.05529 0.4232	-0.02189 0.7513	-0.03427 0.6198	0.06490 0.3470	0.11860 0.0849
IFC1 INV. 1-YR FND CSTS W/EXP EXCL. REV.	-0.01015 0.8832	1.00000 0.0	0.37129 0.0001	0.88415 0.0001	0.30028 0.0001	0.37228 0.0001	0.31143 0.0001	0.22175 0.0012	0.25138 0.0002
IFC3 INV. 3-YR FND CSTS W/EXP EXCL. REV.	-0.02399 0.7284	0.37129 0.0001	1.00000 0.0	0.37220 0.0001	0.77231 0.0001	0.50785 0.0001	0.79812 0.0001	0.22125 0.0012	0.52477 0.0001
IFC1R INV. 1-YR FND CSTS W/EXP INCL. REV.	-0.00996 0.8853	0.88415 0.0001	0.37220 0.0001	1.00000 0.0	0.44740 0.0001	0.34921 0.0001	0.26484 0.0001	0.42300 0.0001	0.36156 0.0001
IFC3R INV. 3-YR FND CSTS W/EXP INCL. REV.	0.05529 0.4232	0.30028 0.0001	0.77231 0.0001	0.44740 0.0001	1.00000 0.0	0.39873 0.0001	0.50332 0.0001	0.48416 0.0001	0.78502 0.0001
IFC1D INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	-0.02189 0.7513	0.37228 0.0001	0.50785 0.0001	0.34921 0.0001	0.39873 0.0001	1.00000 0.0	0.54134 0.0001	0.55748 0.0001	0.38091 0.0001
IFC3D INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	-0.03427 0.6198	0.31143 0.0001	0.79812 0.0001	0.26484 0.0001	0.50332 0.0001	0.54134 0.0001	1.00000 0.0	0.09548 0.1660	0.47925 0.0001
IFC1RD INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.06490 0.3470	0.22175 0.0012	0.22125 0.0012	0.42300 0.0001	0.48416 0.0001	0.55748 0.0001	0.09548 0.1660	1.00000 0.0	0.59210 0.0001
IFC3RD INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.11860 0.0849	0.25138 0.0002	0.52477 0.0001	0.36156 0.0001	0.78502 0.0001	0.38091 0.0001	0.47925 0.0001	0.59210 0.0001	1.00000 0.0

Appendix E
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
 Analysis By Year

17:51 Sunday, September 25, 1994 51

----- YEAR=85 -----

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
EFF	212	0.09277	0.11935	19.66706	0.00235	1.00000	EFFICIENCY MEASURE
IFC1	212	1.72645	9.54709	366.00836	0.01033	128.50000	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	212	0.61468	1.68379	130.31130	0.01471	20.70370	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	212	-0.10328	11.01940	-21.89595	-130.15385	66.08333	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	212	0.29939	1.59644	63.47174	-9.67640	13.60435	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	212	0.17775	0.50872	37.68258	0.00292	6.94595	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	212	0.13471	0.12609	28.55935	0.00989	1.16823	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	212	0.02489	0.73174	5.27585	-6.86338	3.57207	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	212	0.07157	0.27396	15.17387	-2.34284	1.32697	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix E
Pearson Correlation Coefficients Between EFF and Finding Costs
For Group A (Survivors) and Group B (Non-survivors) - 1982-1985
Analysis By Year

17:51 Sunday, September 25, 1994 52

----- YEAR=85 -----

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 212

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF	1.00000	-0.05311	-0.04762	-0.03371	0.02065	-0.04569	-0.01407	0.01430	0.08438
EFFICIENCY MEASURE	0.0	0.4418	0.4904	0.6255	0.7650	0.5082	0.8386	0.8360	0.2211
IFC1	-0.05311	1.00000	0.89453	0.25927	0.49985	0.89616	0.63722	0.31837	0.14371
INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.4418	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0365
IFC3	-0.04762	0.89453	1.00000	0.31540	0.59306	0.84500	0.82325	0.20768	0.16809
INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.4904	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0024	0.0143
IFC1R	-0.03371	0.25927	0.31540	1.00000	0.35987	0.40775	0.26508	0.40855	0.26940
INV. 1-YR FND CSTS W/EXP INCL. REV.	0.6255	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3R	0.02065	0.49985	0.59306	0.35987	1.00000	0.37386	0.40348	0.65691	0.78818
INV. 3-YR FND CSTS W/EXP INCL. REV.	0.7650	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001
IFC1D	-0.04569	0.89616	0.84500	0.40775	0.37386	1.00000	0.70566	0.32061	0.07874
INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.5082	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.2537
IFC3D	-0.01407	0.63722	0.82325	0.26508	0.40348	0.70566	1.00000	0.01466	0.01407
INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.8386	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.8320	0.8386
IFC1RD	0.01430	0.31837	0.20768	0.40855	0.65691	0.32061	0.01466	1.00000	0.75011
INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.8360	0.0001	0.0024	0.0001	0.0001	0.0001	0.8320	0.0	0.0001
IFC3RD	0.08438	0.14371	0.16809	0.26940	0.78818	0.07874	0.01407	0.75011	1.00000
INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.2211	0.0365	0.0143	0.0001	0.0001	0.2537	0.8386	0.0001	0.0

Appendix E
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group C (New Entrants) - 1989-1992
 Analysis By Year

17:51 Sunday, September 25, 1994 53

----- YEAR=90 -----

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
EFF	119	0.26993	0.18762	32.12145	0.00873	1.00000	EFFICIENCY MEASURE
IFC1	119	0.79216	1.78106	94.26723	0.00450	18.68301	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	119	0.63950	0.68873	76.10095	0.03101	4.77190	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	119	0.98887	1.82379	117.67548	-0.85497	15.04575	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	119	0.91094	1.24330	108.40222	-0.29491	8.58735	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	119	0.18091	0.13060	21.52776	0.00303	0.74072	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	119	0.17419	0.10602	20.72883	0.01624	0.59069	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	119	0.23033	0.25632	27.40895	-0.19099	2.11141	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	119	0.23058	0.18048	27.43884	-0.25259	1.37928	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix E
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group C (New Entrants) - 1989-1992
 Analysis By Year

17:51 Sunday, September 25, 1994 54

----- YEAR=90 -----

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 119

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF	1.00000	0.07415	0.02596	0.12791	-0.04535	0.30355	0.27895	0.28620	0.23459
EFFICIENCY MEASURE	0.0	0.4229	0.7793	0.1657	0.6243	0.0008	0.0021	0.0016	0.0102
IFC1	0.07415	1.00000	0.45130	0.85302	0.27218	0.34196	0.29121	0.13439	0.17023
INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.4229	0.0	0.0001	0.0001	0.0027	0.0001	0.0013	0.1451	0.0642
IFC3	0.02596	0.45130	1.00000	0.34623	0.73516	0.26437	0.53012	0.02905	0.31436
INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.7793	0.0001	0.0	0.0001	0.0001	0.0037	0.0001	0.7538	0.0005
IFC1R	0.12791	0.85302	0.34623	1.00000	0.33983	0.27269	0.21555	0.47436	0.41800
INV. 1-YR FND CSTS W/EXP INCL. REV.	0.1657	0.0001	0.0001	0.0	0.0002	0.0027	0.0186	0.0001	0.0001
IFC3R	-0.04535	0.27218	0.73516	0.33983	1.00000	0.05193	0.21058	0.20262	0.53373
INV. 3-YR FND CSTS W/EXP INCL. REV.	0.6243	0.0027	0.0001	0.0002	0.0	0.5748	0.0215	0.0271	0.0001
IFC1D	0.30355	0.34196	0.26437	0.27269	0.05193	1.00000	0.77435	0.36403	0.35796
INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0008	0.0001	0.0037	0.0027	0.5748	0.0	0.0001	0.0001	0.0001
IFC3D	0.27895	0.29121	0.53012	0.21555	0.21058	0.77435	1.00000	0.22638	0.41799
INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0021	0.0013	0.0001	0.0186	0.0215	0.0001	0.0	0.0133	0.0001
IFC1RD	0.28620	0.13439	0.02905	0.47436	0.20262	0.36403	0.22638	1.00000	0.81363
INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.0016	0.1451	0.7538	0.0001	0.0271	0.0001	0.0133	0.0	0.0001
IFC3RD	0.23459	0.17023	0.31436	0.41800	0.53373	0.35796	0.41799	0.81363	1.00000
INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.0102	0.0642	0.0005	0.0001	0.0001	0.0001	0.0001	0.0001	0.0

Appendix E
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group C (New Entrants) - 1989-1992
 Analysis By Year

17:51 Sunday, September 25, 1994 55

----- YEAR=91 -----

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
EFF	119	0.26993	0.18762	32.12145	0.00873	1.00000	EFFICIENCY MEASURE
IFC1	119	0.55615	0.73075	66.18228	0.02671	6.10383	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	119	0.58532	0.56698	69.65315	0.03811	3.27976	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	119	0.57925	1.26608	68.93036	-3.54386	9.18557	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	119	0.73327	0.89182	87.25939	-0.09482	6.21837	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	119	0.16038	0.15317	19.08463	0.00490	0.93860	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	119	0.16755	0.09293	19.93869	0.01202	0.46598	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	119	0.15463	0.29954	18.40040	-0.79216	2.10794	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	119	0.19915	0.13745	23.69848	-0.06854	0.86408	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix E
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group C (New Entrants) - 1989-1992
 Analysis By Year

17:51 Sunday, September 25, 1994 56

----- YEAR=91 -----

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 119

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF	1.00000	0.16412	0.16832	0.08272	0.11734	0.22063	0.33521	0.16357	0.32731
EFFICIENCY MEASURE	0.0	0.0745	0.0673	0.3711	0.2037	0.0159	0.0002	0.0755	0.0003
IFC1	0.16412	1.00000	0.73956	0.36760	0.35334	0.55198	0.40341	0.31248	0.21634
INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.0745	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0005	0.0181
IFC3	0.16832	0.73956	1.00000	0.24374	0.64660	0.38418	0.59079	0.12186	0.38245
INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.0673	0.0001	0.0	0.0076	0.0001	0.0001	0.0001	0.1868	0.0001
IFC1R	0.08272	0.36760	0.24374	1.00000	0.57337	0.31680	0.10123	0.70704	0.32698
INV. 1-YR FND CSTS W/EXP INCL. REV.	0.3711	0.0001	0.0076	0.0	0.0001	0.0004	0.2733	0.0001	0.0003
IFC3R	0.11734	0.35334	0.64660	0.57337	1.00000	0.21597	0.28302	0.26226	0.64700
INV. 3-YR FND CSTS W/EXP INCL. REV.	0.2037	0.0001	0.0001	0.0001	0.0	0.0183	0.0018	0.0040	0.0001
IFC1D	0.22063	0.55198	0.38418	0.31680	0.21597	1.00000	0.66159	0.71024	0.44677
INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0159	0.0001	0.0001	0.0004	0.0183	0.0	0.0001	0.0001	0.0001
IFC3D	0.33521	0.40341	0.59079	0.10123	0.28302	0.66159	1.00000	0.29910	0.53589
INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0002	0.0001	0.0001	0.2733	0.0018	0.0001	0.0	0.0010	0.0001
IFC1RD	0.16357	0.31248	0.12186	0.70704	0.26226	0.71024	0.29910	1.00000	0.40730
INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.0755	0.0005	0.1868	0.0001	0.0040	0.0001	0.0010	0.0	0.0001
IFC3RD	0.32731	0.21634	0.38245	0.32698	0.64700	0.44677	0.53589	0.40730	1.00000
INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.0003	0.0181	0.0001	0.0003	0.0001	0.0001	0.0001	0.0001	0.0

Appendix E
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group C (New Entrants) - 1989-1992
 Analysis By Year

17:51 Sunday, September 25, 1994 57

----- YEAR=92 -----

Correlation Analysis

9 'VAR' Variables: EFF IFC1 IFC3 IFC1R IFC3R IFC1D IFC3D IFC1RD IFC3RD

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
EFF	119	0.26993	0.18762	32.12145	0.00873	1.00000	EFFICIENCY MEASURE
IFC1	119	1.09037	3.09093	129.75378	0.00081481	29.05814	INV. 1-YR FND CSTS W/EXP EXCL. REV.
IFC3	119	0.61288	0.68948	72.93287	0.01465	4.52686	INV. 3-YR FND CSTS W/EXP EXCL. REV.
IFC1R	119	0.75099	4.01546	89.36791	-22.30000	25.68992	INV. 1-YR FND CSTS W/EXP INCL. REV.
IFC3R	119	0.66183	0.81096	78.75751	-1.24671	4.97810	INV. 3-YR FND CSTS W/EXP INCL. REV.
IFC1D	119	0.18102	0.24067	21.54083	0.00019880	1.63266	INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC3D	119	0.16176	0.10163	19.24970	0.00447	0.72776	INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.
IFC1RD	119	0.16795	0.39002	19.98649	-1.30152	2.40739	INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.
IFC3RD	119	0.17453	0.17680	20.76885	-0.41557	1.39652	INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.

Appendix E
 Pearson Correlation Coefficients Between EFF and Finding Costs
 For Group A (Survivors) and Group C (New Entrants) - 1989-1992
 Analysis By Year

17:51 Sunday, September 25, 1994 58

----- YEAR=92 -----

Correlation Analysis

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0 / N = 119

	EFF	IFC1	IFC3	IFC1R	IFC3R	IFC1D	IFC3D	IFC1RD	IFC3RD
EFF	1.00000	0.11410	0.24249	0.18747	0.30100	0.29080	0.43270	0.29145	0.38188
EFFICIENCY MEASURE	0.0	0.2166	0.0079	0.0412	0.0009	0.0013	0.0001	0.0013	0.0001
IFC1	0.11410	1.00000	0.71958	0.62977	0.47853	0.61262	0.46859	0.35646	0.24363
INV. 1-YR FND CSTS W/EXP EXCL. REV.	0.2166	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0076
IFC3	0.24249	0.71958	1.00000	0.48296	0.72890	0.61230	0.65564	0.41678	0.40462
INV. 3-YR FND CSTS W/EXP EXCL. REV.	0.0079	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
IFC1R	0.18747	0.62977	0.48296	1.00000	0.63986	0.49391	0.34121	0.69688	0.46544
INV. 1-YR FND CSTS W/EXP INCL. REV.	0.0412	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001	0.0001
IFC3R	0.30100	0.47853	0.72890	0.63986	1.00000	0.67161	0.59731	0.76516	0.82016
INV. 3-YR FND CSTS W/EXP INCL. REV.	0.0009	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001	0.0001
IFC1D	0.29080	0.61262	0.61230	0.49391	0.67161	1.00000	0.79509	0.76079	0.69596
INV. 1-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0013	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001	0.0001
IFC3D	0.43270	0.46859	0.65564	0.34121	0.59731	0.79509	1.00000	0.55029	0.67230
INV. 3-YR FND CSTS W/EXP,DEV EXCL. REV.	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.0001	0.0001
IFC1RD	0.29145	0.35646	0.41678	0.69688	0.76516	0.76079	0.55029	1.00000	0.82034
INV. 1-YR FND CSTS W/EXP,DEV INCL. REV.	0.0013	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0	0.0001
IFC3RD	0.38188	0.24363	0.40462	0.46544	0.82016	0.69596	0.67230	0.82034	1.00000
INV. 3-YR FND CSTS W/EXP,DEV INCL. REV.	0.0001	0.0076	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0

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