

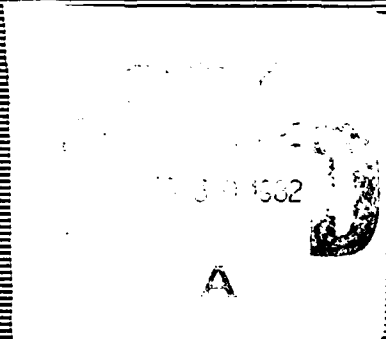
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EFFICIENCY EVALUATION OF EEO PROGRAM MANAGEMENT

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BY | E.S. Bres III
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July 1982

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ABSTRACT

The U.S. Navy Civilian EEO program was analyzed to evaluate the efficiency with which various installations attain their EEO goals. Generalized efficiency approaches or Data Envelopment Analysis (DEA) were used for this model study. Data on 75 major installations are used to analyze such factors as: occupational differences, relative EEO Parity attainment, size of installations, and number of EEO officials.

Introduction

The measurement of EEO program efficiency entails (i) a comparison of resource utilization and outcomes achieved by various EEO program units and (ii) an evaluation of the outcome levels each program has achieved relative to what other program units using a similar mix of resources have achieved. Units thus identified as efficient are used as models of best practice in the evaluation of the remaining (inefficient) program units. On the basis of this type of evaluation, the Navy can initiate case studies of selected efficient and inefficient units to determine what organizational action might help improve the operational efficiency of their EEO programs.

In a previous paper (Charnes, Cooper, Niehaus and Schinnar; (1982)) a framework for evaluating the efficiency with which various units of the U.S. Navy attain their civilian EEO goals was developed. The approach is based on the Charnes, Cooper and Rhodes (1978) Data Envelopment Analysis (DEA) method for efficiency evaluation and frontier estimation and on Schinnar's (1980) algorithmic implementation of the technique. The methodology measures the efficiency of the conversion of program resources into program outputs that reflect the improvement in the representation of women and minorities in the various Navy units.

A numerical application of the methodology to a data base on 18 of the Navy's organizational units that meet a minimum size requirement of 1000 civilian employees was used to illustrate the application of the method. This initial application has led the Navy to consider further tests with more detail and covering more and smaller organizational units. These tests included the use of operational data from the Department of the Navy EEO Goals Accountability System (DONEAS)¹ which was used to develop EEO goals based on estimated relevant labor market supply ratios and organizational data.

In this paper we use data on 75 major installations (units) in the Navy to assess the effectiveness with which job opportunities in the organization and available manpower in the relevant labor markets are converted into improved representation for women and minorities. The analysis is performed for three job categories:

Managers and Administrators (GS 9-12)

Technicians (GS 9-12), and

¹DONEAS was institutionalized by Secretary of the Navy Instruction (SECNAVINST) 12713.12 of 3 April 1981 to develop the FY 82-86 Affirmative Action Program Plan (AAPP) required by the EEOC. The DONEAS may be substantially revised based on how the 1980 Census data is incorporated into affirmative action planning. Also see Niehaus (1979) and Aiken, Murphy, Niehaus, and Nelson (1981).

Craftsman/Operatives at the Journeyman level

with reference to the following questions:

1. Are there differences in EEO program effectiveness among the three occupational groups?
2. Does the attainment of EEO parity goals affect the - effectiveness of the EEO program?
3. Are there scale effects; does the size of the unit affect the performance of the EEO functions?
4. Does the number of EEO program managers and officers correlate with the performance of the program?

An important output of the research is the usage of the various input and output data parameters in an organized way. As is well known, usage helps to sort out what can and cannot be measured. At this stage of development it can be expected that at least one more prototype cycle beyond the tests documented in this report would be needed before the model could be put into an operational status in the EEO area.

The paper is organized in four major sections. Section 2

gives the general background to the analysis of efficiency and effectiveness in the U.S. Navy. The data for and the results of the analyses are discussed in Sections 3 and 4, respectively, with concluding remarks given in Section 5.

2. Background

The EEO component of the Navy human resource planning function focuses on setting EEO affirmative action goals and establishing policies supporting these objectives consistent with strategic mission plans and possible operational personnel decisions. The concurrent concerns about scarce resources and social accountability have spurred the search for better tools for management control in order to ensure that the policy objectives are effectively and efficiently realized. In this paper we focus on the appraisal of an organization's performance in converting its resources and recruitment opportunities into preferred social outcomes.

Unlike situations in business and engineering enterprises where it may be possible to specify achievable levels of productivity, there are no known quantitative relationships between EEO program inputs and outputs. Since the maximum level of EEO program outputs obtainable for a given level of inputs can't be determined a priori, we must use relative efficiency

measures for EEO program management. An organizational unit is considered efficient, relative to others, if no other unit produces at least the same level of every output with equal or less use of inputs. Thus, a unit's efficiency is determined relative to what has been shown to be attainable by other units with, at most, as many resources.

The methodological approach which was extensively discussed in Charnes, Cooper, Niehaus and Schinnar (1982) allows for the incorporation of many different input and output indicators. For example, inputs may include such variables as the number of EEO staff, cost of program operation, the number of employment opportunities available, etc. Indicators of program outputs include, though are certainly not limited to, such measures as changes in the representation of women and minorities, the number of discrimination complaints informally resolved, etc.

The results of the analysis will enable management to identify both the efficient and inefficient activities within an organization. The efficient activities provide potentially achievable standards for inefficient units with similar combinations of inputs and outputs. Comparative analyses enable the manager to determine what additional output, and/or reduction of inputs would be possible if existing more efficiently technologies were incorporated.

Additionally, EEO efficiency measures provide managers with a set of tradeoff indicators. These indicators reflect possible substitution between the various program resources. If cost containment is an essential concern of the organization, then the opportunity to strike substitutions between more expensive resources and less expensive resources is extremely desirable. Indicators reflecting trade-off ratios among outcomes are equally useful, especially when the relevant labor market provides only a limited supply of personnel.

From a larger scale perspective, the EEO efficiency model provides a means of checking basic behavioral assumptions. For example, one could use the model to obtain a better understanding of the effect of EEO goals on the deployment of resources by managers. If in fact the behavioral assumption is true that those managers who meet their EEO goals are generally among the most efficient, then simple effectiveness measures (e.g., tracking of goals, complaint indexes, etc.,) may be all that is needed for EEO program management. In turn, many of the demands for EEO related personnel information diminish except in those cases where systemic discrimination is suspected. The efficiency model study is a way of sorting out some of such supposedly intractable questions in the early operational stage of management information system development.

3. Data

The following analysis focuses on two aspects of EEO human resource planning. The first is the use of recruitment opportunities to increase female and minority representation. The opportunities reflect external labor market conditions, as well as internal opportunities for hiring and promotion. The second aspect is the measurement of improvement in the levels of representation of minority and female personnel during a one-year transition period, September 1979 to September 1980 (i.e., Fiscal Year 80).

The relative efficiency methodology compares the level of performance of each Navy unit to that shown possible by the performance of all other units. In this study efficiency measures are calculated based on each unit's performance in improving minority and female representation in its civilian workforce given specific external and internal labor market conditions for the unit as well as levels of representation at the beginning of the year.

Due to the limited availability of data on traditional resource levels (i.e. budget, staff, etc.), the focus of the study is on the conversion of recruitment opportunities into representation. The resulting efficiency scores, however, will

be related to resource availability in order to assess whether units judged efficient in converting opportunities had more discretionary resources.

The data base employed in this study describes 75 Navy installations, all but two of which met at a minimum size requirement of 500 or more personnel. Data was collected for three aggregate Race-National Origin-Sex (RNS) categories and three occupation and level classifications. However, because of difficulties with missing and sparse data, the final analysis focuses on evaluating the efficiency of 70, 66, and 63 units for each of the three job categories, respectively.

The RNS classifications incorporate three population groups:

1. Minority Males (MM)
2. Minority Females (MF)
3. White Females (WF)

The occupational categories used in the study are as follows:

1. Managers & Administrators, GS 9-12
2. Technicians, GS 9-12
3. Craftsmen/Operatives, Journeyman level.

The Manager & Administrator category includes, but is not limited to, the following positions: financial managers, personnel managers, procurement managers, logistics managers, computer specialists, and intelligence specialists. Most Technicians employed by the Navy in a civilian capacity are engineering and science technicians, medical technicians, and computer technicians. The Craftsmen/Operatives are primarily craft workers, mechanics, and operators of machines and equipment. With the exception of laborers, most Navy blue collar positions are classified in this category.

Seven input variables are used in the study. The first three correspond to the beginning year representation levels for each of the population groups, respectively. The use of begin year representation levels ensures that the resulting efficiency scores account for initial accomplishment levels. In this way we avoid penalizing units that have made proportionately great strides during the transition period, yet still employ relatively few minority and female personnel. Conversely, units that have high initial representations for the targeted population groups, yet make little attempt to increase these levels, should not be erroneously rewarded because of their high initial start. The representation inputs provide a benchmark from which to begin the analysis.

The fourth input variable is opportunity rate. This input is designed to reflect the opportunity each unit had to change the composition of its workforce. It is defined as the sum of all promotions, transfers, and hires into a job category and level, divided by the total number of employees in the occupation and grade at the beginning of the year. Since units are often constrained by personnel and budget ceilings and/or hiring freezes, it is important to account, as we do here, for actions taken rather than actions that may not have been possible.

The last input indicators reflect the opportunity for recruiting a specific RNS category from the Relevant Labor Force (RLF). An RLF measure of .10 for white females indicates that in this specific labor market 10% of the population qualified for this occupation and level are white females. Since minority female representation levels and RLF measures were quite small, these inputs were combined with the corresponding inputs for minority males, reducing the number of inputs from 7 to 5:

EEO PROGRAM INPUTS

1. Representation of (MM+MF) (Begin FY 79)
2. Representation of (WF) (Begin FY 79)
3. Opportunity Rate
4. RLF measure (MM+MF)

5. RLF measure (WF)

The output indicators are the numbers of personnel in each of the three RNS categories on board at the end of the one year transition period (Begin FY 80). They are designed to reflect the improvement in representation levels of the three population groups. Again, due to the existence of very small numbers associated with the MF category, this group's data have been combined with that for the MM category, yielding a total of two outputs for each unit:

EEO PROGRAM OUTPUTS

1. Representation of (MM+MF) (Begin FY 80)
2. Representation of (WF) (Begin FY 80)

Missing from the analysis is information concerning EEO complaints. An attempt was made to include this data using manually developed reports. However, these reports were found to be inadequate and the complaints related part of the EEO officials workload was not included in the study.

4. Results

The analysis of efficiency was carried out: (a) to show

differences in efficiency of recruitment in the three occupational categories; (b) to show actual changes in levels of minorities and women represented within each occupation; (c) to evaluate all change in parity status through the period of analysis and compare these changes with efficiency scores; (d) to explore the relationship of representation levels and size of unit; (e) to examine the efficiency of the units in light of EEO staff availability. An efficiency rating of 1.00 indicates an efficient conversion of opportunities into representation. Scores ranging from 0 to .99 reflect the degree of efficiency with which opportunities in both the internal and external labor markets, along with personnel from the beginning of FY 79, were converted into numbers of female and minority personnel by the beginning of FY 80.

a. Efficiency Scores

Efficiency scores were developed for each unit in each of the three occupational classifications, by major functional area (shipyards, laboratories, etc). The results indicate that almost 50% of the units in each job category were efficient (1.00). In part, this may be attributable to the high correlation between the representation levels at the beginning of the transition period (input side) and the representational levels at the end of this period (output side). Nevertheless, a significant number of

units in each occupational group were less efficient. The subsequent analysis focuses on interpreting these differences in efficiency between the various occupations.

The histograms, exhibited in Figure 1, reflect the distribution of efficiency scores for each of the three job classifications. The three frequency distributions indicate, for each separate occupation, the number of units that appear in each efficiency interval. The histograms generally reveal that the distributions are all skewed towards the efficiency frontier. For example, 49 out of a total of 63 Craftsman units attained efficiency scores greater than 0.9. Though the bulk of observations fall on or very close to the efficiency frontier for this specific occupation, similar tendencies are also exhibited in the remaining two job categories. The general form of all three distributions suggests a strong skew toward the frontier; however, as expressed previously, this phenomenon could be a direct result of the collinearity between the input and output indicators.

b. Changes in Levels of Representation

The next section of the analysis focuses on the actual changes in the levels of minority members and white females at

the end of the transition period. Table 1 indicates, for each occupation, the number of units that are associated with different types of changes in representation levels for the two composite RNS groups. The first row shows units with an increase for both population groups. The second and third rows show units with tradeoffs between the representation of minority members and white females. More specifically, the entries in row two indicate units that experienced an increase in the number of minority members, with a concomitant decrease in the level of white female representation. The third row reflects the inverse of the preceding situation; an increase in the number of white female's employed was coupled with a decrease in minority male representation. The last classification indicates a decline in the level of representation for both RNS groups.

Associated with each occupation are two columns reflecting the number of units in category and average efficiency scores, respectively. The numbers in parentheses indicate the corresponding column percentage. For Managers, 23 of the 70 units (or 32.9%), revealed an increase in the representation level for both population groups. Fifteen units (21.4%) registered a decline for both RNS groups and 25 units (35.7%) exhibited an increase for white females representation only.

As anticipated, efficiency scores are higher for units which

Distribution of Scores by Occupation

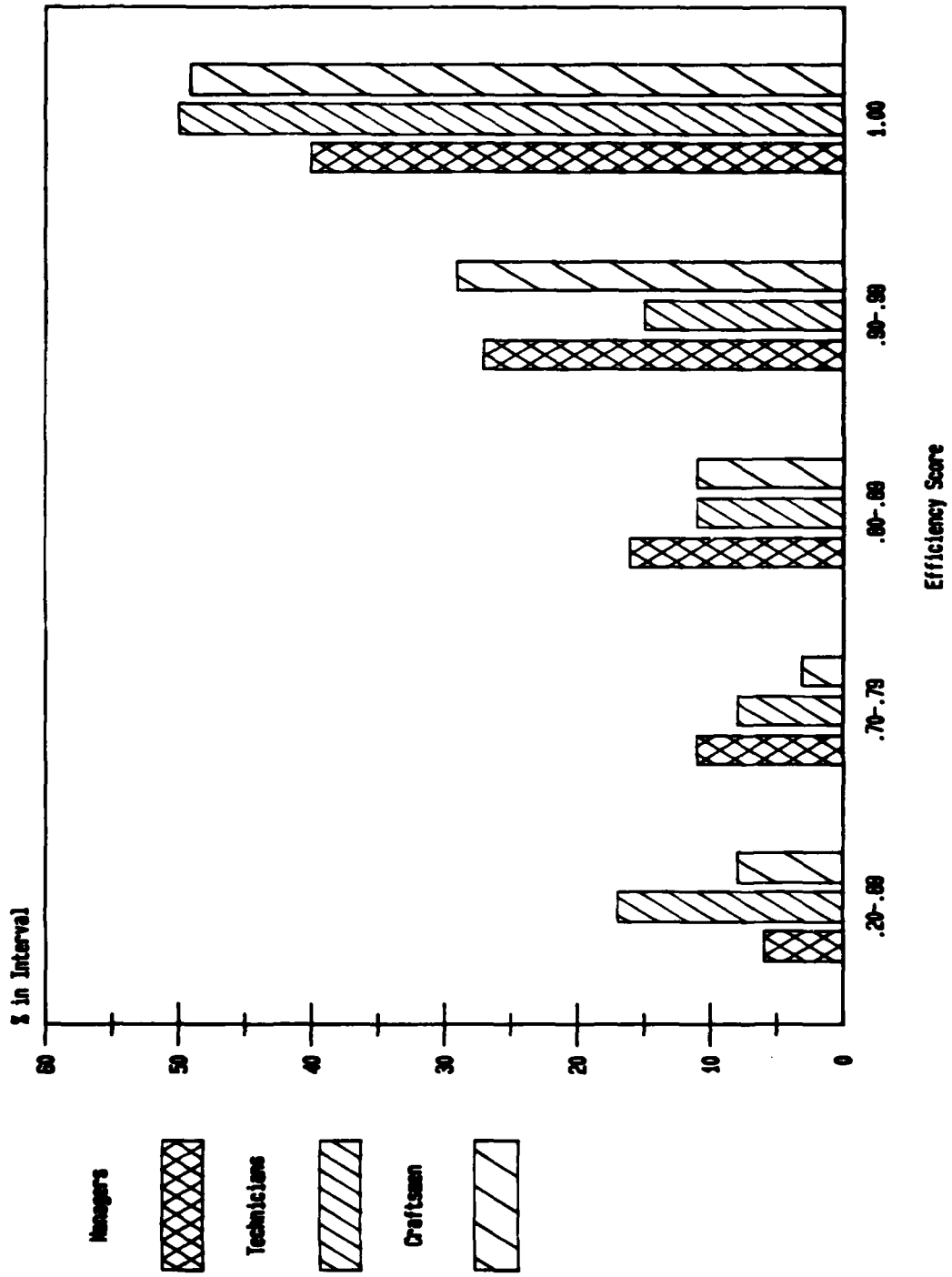


FIGURE 1

CHANGE IN REPRESENTATION LEVELS BETWEEN FY 79 AND FY 80

Job Categories

	<u>Managers/Administrators</u>		<u>Technicians</u>		<u>Craftsmen/Operatives</u>	
	<u>number of units</u>	<u>average efficiency</u>	<u>number of units</u>	<u>average efficiency</u>	<u>number of units</u>	<u>average efficiency</u>
Increase MM						
Increase WF	23(32.9%)	.927	15(22.7%)	.968	10(15.8%)	.980
Increase MM	7(10%)	.932	13(19.7%)	.947	11(17.5%)	.970
Increase WF						
Increase WF	25(35.7%)	.906	11(16.6%)	.940	14(22.2%)	.973
Increase WM						
Increase MM						
Increase WF	15(21.4%)	.813	27(40.9%)	.789	28(44.5%)	.823

MM = Minority Males & Females
WF = White Females

TABLE 1

increased the representation levels of both populations than for those which experienced a decline for both groups. The tradeoff classifications yield the most interesting results. The majority of units in these two categories reflected a decrease in the minority population coupled with an increased representation for white females. In terms of efficiency, however, these units averaged a lower rating than for those units in which minority representation was substituted for white female representation.

In the Manager job category more units showed improvement in both population groups. Twice as many observations in the remaining occupations (over 40%) were associated with a decrease in the representation of both RNS groups. As indicated previously, the average efficiency score for those activities experiencing declines in their representation levels was lower for those units revealing progress.

For both the Technician and Craftsman job categories, there are almost an equal number of observations distributed between the two tradeoff classifications for each occupation. In addition, the resultant efficiency ratings are nearly equal in these two tradeoff categories. It is of interest to note that the efficiency scores associated with the Craftsman category are higher than any corresponding classification in the remaining two occupations. It is important to emphasize that efficiency

ratings are calculated for each occupation separately: inferences about relative positions should be made within, not across, occupational categories.

Overall, very similar frequency groupings are revealed for Technicians and Craftsmen. Patterns of change minority and female representation for these two occupations were very different from those in the Management occupation, where there was a greater tendency to improve the representation of both population groups. However, the efficiency scores associated with the Manager category are generally lower than those for Technicians and Craftsmen. This suggests that, while there is a trend toward progress in the Manager occupational category, opportunities are not used as efficiently as in the other job categories. There may be less of an overall EEO effect in the Technicians and Craftsmen occupations: however, the conversion of opportunities in these two job categories appears to be more efficient.

C. Parity

A units' representation parity is calculated by dividing the representation rate for MM, MF, or WF employed in a specific job category by the units' Relevant Labor Force representation rate for the corresponding RNS group. Consider the following

hypothetical example for illustrative purposes. Ten percent of a unit's management positions are filled by minority males. Suppose that minority male representation in the RLF is 18%. Dividing .10 by .18, we note that the unit has reached 55% of representation parity for minority males. Alternatively, this measure implies that the unit is 45% away from attaining 100% parity for minority males. Essentially, this indicator reflects a unit's performance in converting internal opportunities into representation, taking into explicit account existing opportunities in the external labor market. Many units were above parity for a particular occupation and RNS group. As parity data for these units was truncated at 100%, the extent of representation above parity was not considered.

Table 2 organizes parity conditions (states) in the form of a mobility matrix. Observations are arranged according to the changes, if any, in parity status that have occurred during the transition period. The purpose of including this table in the analysis is to determine whether changes in parity status could, in any way, explain the differences in efficiency scores.

The rows in Table 2 reflect initial parity states. The columns in the table indicate end year parity states. The four

parity classification are as follows:

1. Parity with respect to both RNS groups
2. Parity with respect to MM, and not WF
3. Parity with respect to WF, and not MM
4. No attainment of parity for either population group.

Those units along the diagonal in Table 2 experienced no change in parity status during the one year transition period. Entries above the diagonal reflect a movement from parity to no parity, or a change from parity for minorities to parity for white females. Entries below the diagonal of the matrix indicate movements from no parity to parity or a change from white female to minority parity.

The general tendency is for most units to remain in their former parity classification at the end of the transition period. For those few that moved from more parity to less parity (3 units) the average efficiency scores were significantly low. Those units that improved representation to full parity for either RNS group or both received, as anticipated, efficiency ratings higher than for other movement classifications.

CHANGE IN PARITY STATUS BETWEEN FY79 AND FY80 (ALL JOB CATEGORIES)

Parity state in FY 79:	Parity State in FY 80			no parity MM & WF
	parity MM & WF	parity MM only	parity WF only	
Parity MM & WF	parity MM & WF managers: f = 39; x = .921 technicians: f = 26; x = .912 craftsmen: f = 1; x = .928		parity WF only managers: f = 1; x = .786	
Parity MM only	managers: f = 2; x = .946 technicians: f = 3; x = 1.00	managers: f = 10; x = .848 technicians: f = 21; x = .895 craftsmen: f = 53; x = .92		technicians: f = 1; x = .65 craftsmen: f = 1; x = .43
Parity WF only	managers: f = 2; x = 1.00		managers: f = 10; x = .954 technicians: f = 3; x = .765	
No parity MM & WF			managers: f = 1; x = 1.00 technicians: f = 12; x = .837 craftsmen: f = 6; x = .96	

MM = Minority Males & Females
 WF = White Females
 f = frequency
 x = average efficiency score

TABLE 2

Examining the diagonal entries, we note that with regard to the Craftsmen occupation the majority of observations (53/63) are concentrated in the minority male parity state, and aside from noting an average efficiency score of .92, there remains little for discussion. Therefore the analysis will focus on the two remaining occupational categories.

For both Managers and Technicians the largest number of units maintained parity for both RNS groups, (39 and 26 units respectively). With respect to Technicians, however, almost as many units maintained parity just for minority male (21 observations).

Those units that began with parity for both RNS groups, with the exception of one unit which appears to be an outlier, remained in this classification at the end of the transition period. The resulting efficiency scores are very similar: .921, .912, and .928. The efficiency rating for those units maintaining parity for only minority male are lower; .85 for Managers and .89 for Technicians. When parity has not been attained for either population group, the efficiency measures yield an average score of .82 (Managers), and .84 (Technicians).

The most curious result occurs for units that maintain only white female parity. For managers, specifically, the average

efficiency score of .954 is greater than for any other category in which parity is maintained. In fact, this efficiency rating is more than 10% higher than the score for those units maintaining minority male parity despite the fact that the number of observations distributed between these two classifications is equal. This suggests that the conversion of opportunities is more efficiently realized for white females employed in the Manager, GS 9-12, occupation. The corresponding efficiency measure for those units that maintained parity for white females in the Technician occupation only .765. As there are only 3 observations in this classification, the sample may be too small to draw any conclusions.

In general, with the exception of the white female parity classification, those units that remained in parity for both R/S groups have higher efficiency scores than others. An initial hypothesis that units which had achieved parity might show lower efficiencies since less change would be required was not substantiated. On the contrary, activities maintaining parity seem to exhibit an efficient conversion of opportunities.

There are two primary ways in which to analyze EEO manpower planning issues. One focus is on the attainment of parity, while an alternative approach concerns itself with actual improvement in representation levels, without any reference to external labor

market conditions. Table 1 addresses the latter approach, while Table 2 explicitly takes into account the relationship between the internal and external relevant labor market conditions. Comparing results for units in the highest attainment groups for each approach (increased representation for both RNS groups versus parity attainment for both groups), we note that the average efficiency rating is lower for those units maintaining parity than for those units experiencing an increase in the number of minority members and white female personnel. This is not a curious result as it is possible for units to continue to exceed parity even though representation levels decline.

d. Unit Size

Figure 2 associates the efficiency ratings with the overall size of each unit. The bars in this histogram reflect the distribution of 199 observations (combining all three job categories) with respect to size versus efficiency. Since it is overall activity size that is being addressed, occupation specific distributions are not as appropriate. Each set of bars reflects the distribution of observations for specific efficiency scores with respect to various activity size intervals. The largest numbers of units are in the 400-999 employee and 1000-2999 employee categories, each with more than 1/3 of the observations. The remaining data is associated with units employing 3000 or more individuals.

The two lefthand sets of bars in Figure 2 indicate the number of units attaining an efficiency score of .9 and above, reflecting efficiency or near efficiency. By combining the column percentages associated with these two sets of bars, we could note that the percentage of observations increases as the size of the unit increases. For example, 63% units with an overall size of 400-999 employees achieved either efficiency or near-efficiency. The next size category (1000-2999 employees) also shows 63% of the observations attaining efficiency or near efficiency. For those units with 3000-4999 employees, 84% of the observations achieved high ratings, and 95% of the units with an overall size of 5000-10,000 employees near-efficiency. The next size category (1000-2999 employees) also shows 63% of the observations attaining efficiency or near efficiency. For those units with 3000-4999 employees, 84% of the observations achieved high ratings, and 95% of the units with an overall size of 5000-10,000 employees exhibited high efficiency scores. This suggests that size may be an important factor in determining efficiency. The larger units may be more competitive in the labor market. There may also be economies of scale in accomplishing organizational goals.

e. EEO Staff Effort

Figure 3 relates efficiency scores to EEO staff availability

Distribution of Scores by Unit Size

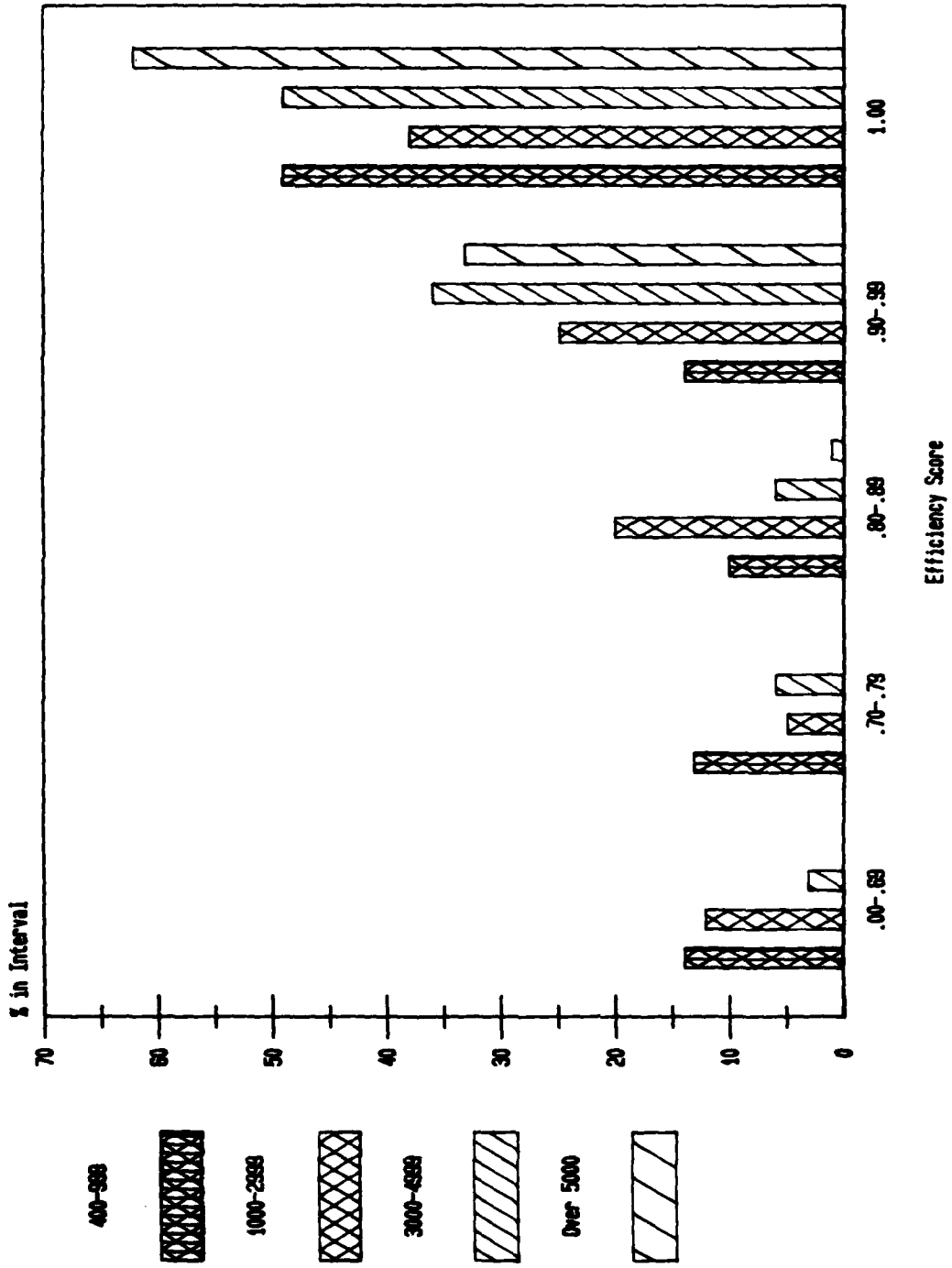


FIGURE 2

to determine whether units with more of this resource are more efficient. The EEO staff indicator measures, in full-time equivalent personnel, the number of program managers and officials serving in the following four positions:

Deputy Equal Employment Opportunity Officer (DEEOO)
Federal Women's Program Manager (FWPM)
Hispanic Employment Program Manager (HEPM)
Federal Equal Opportunity Recruitment Program
(FEORP) Coordinator.

Each of these positions may be filled on a full-time basis, a part-time basis (20% of the full time schedule) or remain unoccupied. These will be at most one full-time equivalent employee for each position. Note that this index does not, however, measure other EEO support staff. Dividing the total number of EEO staff by the corresponding size of the activity (in thousands), yields the number of EEO staff (in full time equivalents) per 1000 civilian employees.

Figure 3 represents the distribution of efficiency scores according to staff availability per activity for all 199 cases. Since the EEO staff serve the needs of the entire activity, the cases are combined for all job categories. Sixty-eight

Effect of Relative EEO Staff Size

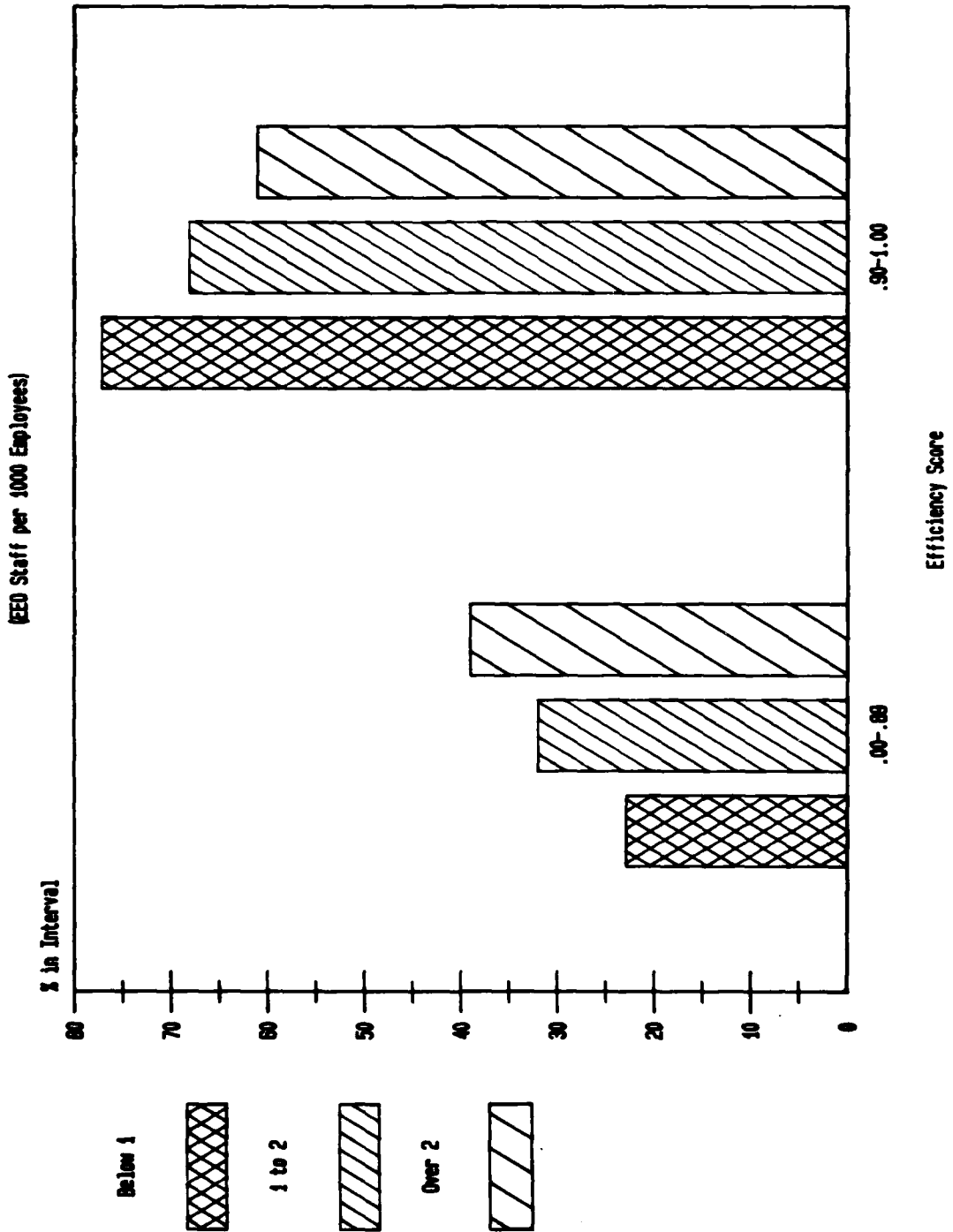


FIGURE 3

observations, one-third of the entire data base, were associated with high efficiency scores and a very small EEO official staff. One half of the cases were associated with two or less EEO officials per 1000 employees and yielded efficiency scores greater than .9. This pattern reveals that for the bulk of the data, a small number of EEO officials is coupled with high efficiency ratings. Though the conclusion must be tempered by the lack of data on EEO supporting staff and on complaint processing, there is an inclination to suggest that when there are fewer EEO officials higher efficiency is achieved.

5. Concluding Remarks & Recommendations

For each of the three occupations studied many units' efficiency scores fell into the efficient or nearly efficient range. By this measure most units seemed to be converting their employment opportunities into increased representation for women and minorities in an efficient manner, given the relevant external and internal labor market conditions. This does not mean that representation increased in every case, but that resources were efficiently used toward this end. The validity of these findings depends in part on the input and output measures available for use. Conclusions should be regarded as tentative until additional data can be secured.

The differences noted between the occupations and units showed an interesting contrast between effectiveness (i.e. the degree to which goals were met) and efficiency (i.e. how well resources were used to attain these goals). Representation was most improved in the Manager occupation, but units achieving these increases showed lower average efficiency scores than those increasing representation in the Technician and Craftsmen occupations. This outcome indicates some of the diagnostic uses of relative efficiency models. Further investigation may reveal underlying cause for the observed differences.

There was a strong tendency for larger units to show higher efficiency scores. This may result from economics of scale, but there may be other reasons as well. Larger units would be more likely to have separate civilian personnel offices or to have more influence with a consolidated personnel office. Another difference is that the larger units are usually industrial facilities or laboratories while the smaller units represent a wide range of types.

Another striking finding was that units with high efficiency generally had few EEO officials compared to the size of the unit. Caution is needed in interpreting this result, however, as EEO supporting staff data were not available. Certainly an EEO staff

is needed. It may be that to obtain the desired results, the number of full time EEO officials does need to be increased beyond a certain point as size increases.

The association between a units' having attained full representation parity for a RNS group and occupation and the units' efficiency score was also examined. Parity status did not change very much over the year. Units that maintained or improved parity in an occupation showed higher average efficiency scores than other units. This implies that EEO goals development and tracking is a positive management tool for achieving EEO program objectives.

The study results must be tempered by the fact that data on EEO complaints was unavailable in the form needed for the analysis. The relationships between the number of EEO complaints and affirmative action achievements are not well know. For example, it may be possible that a larger than average number of complaints will increase awareness, which in turn increases affirmative action accomplishments. On the other hand, one would like to assume that good management will achieve both a lower level of complaints and a positive accomplishment of affirmative action objectives. In any case, any estimates of the need for EEO staff must recognize that complaints processing can consume a good part of the EEO official's time.

One extension of this analysis would consider the interaction between the EEO and personnel functions in a broader assessment of human resource management. As a start, a major personnel function such as staffing could be studied using these methods. As with this study, many of the behavioral characteristics of approaches to personnel management would be surfaced.

Data measurement problems are a continuing issue in these studies. These arise in part because the naval shore establishment, like other larger organizations, uses consolidated personnel servicing arrangements. One result of such studies is to force more data accuracy.

The results of this study indicate that the relative efficiency methodology provides a promising approach to the solution of difficult management problems in the areas of evaluation and control. Further studies along these lines appear warranted.

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