TARGET SETTING: AN APPLICATION TO THE BRANCH NETWORK OF CAJA DE AHORROS DEL MEDITERRANEO*

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ABSTRACT

In this paper we examine the performance of the target setting procedure employed by one of the largest savings banks in Spain, Caja de Ahorros del Mediterraneo, to evaluate the operating performance of its branch offices. We begin by evaluating the ability of the branch offices to meet the targets established by bank management. We then evaluate the targets themselves, and we find that the list of targets can be substantially reduced without significant loss or distortion of information to bank management. We then re-evaluate the performance of branch offices on the basis of a reduced set of influential targets. The analysis is based on target and achievement data for nearly all of the bank's 600 branch offices for the first semester 1995.

Key words: branch offices, target setting, operating performance, DEA.

RESUMEN

En este documento se examinan los resultados de la selección de objetivos usada por la Caja de Ahorros del Mediterráneo, para evaluar los resultados operativos de sus sucursales. Se empieza por evaluar la capacidad de las sucursales para cumplir los objetivos establecidos por la dirección del banco. A continuación se examinan los objetivos en sí llegando a la conclusión que la lista de objetivos se puede reducir sustancialmente sin que por ello se produzca una pérdida significativa o una distorsión de la información a la dirección. Se evaluan de nuevo los resultados de las sucursales en base a una selección reducida de los objetivos más influyentes. Este análisis se basa en los datos sobre los objetivos y logros de casi todas las 600 sucursales de la Caja durante el primer semestre de 1995.

Palabras clave: Oficinas bancarias, objetivos, resultados, DEA.

1. INTRODUCTION

Caja de Ahorros del Mediterraneo is one of the largest savings banks in Spain, operating a regional network of approximately 600 branch offices. Bank management annually sets performance targets covering a wide range of operations at each of its branch offices. These targets are structured to accommodate the realities of local, regional and national economic conditions, and designed to promote the bank's objective of monitoring branch office performance so as to enhance the ability of branch offices to return profit to the bank. Each of the targets fixed on an annual basis is distributed on a monthly basis according to various criteria. (Usually, the criteria are based on past or institutional time series or, otherwise, a simple uniform distribution is used.) At the end of each month, each branch is informed about how it is performing relative to the fixed targets. In our case, the data correspond to the 1995 period ending June 30, and therefore, we are evaluating the target achievement over the first semester of 1995.

This study has two closely related objectives. The first objective is to evaluate the operating performance of the bank's branch offices, in terms of their ability to meet or surpass the targets bank management sets for them. However branch offices typically succeed in meeting or surpassing some targets, while failing to meet others. This greatly complicates performance evaluation when it is conducted on a target-by-target basis, and makes it desirable to aggregate performance indicators across all targets into a single performance indicator. We accomplish such an aggregation by using a linear programming technique known as Data Envelopment Analysis (DEA), which was developed by Charnes, Cooper and Rhodes (1978) for just such a purpose.[1] DEA provides us with a technique with which to aggregate multiple performance indicators into a comprehensive scalar-valued performance indicator for each branch office. This in turn enables us to evaluate and compare indexes of branch office performance across all targets.[2]

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[1]Actually, Charnes, Cooper and Rhodes developed DEA for application in public sector and not-for-profit settings, in which prices are distorted or non-existent. The absence of prices also characterizes the targets set by the bank for its branch offices.

[2]A number of studies have used DEA to evaluate the performance of bank branch networks, although to the best of our knowledge none have done so in a target-setting environment. Many of these studies are discussed in Metters, Frei and Vargas (1995). These and a few other studies are listed and classified in Berger and Humphrey (1996). The most recent contributions are due to Hartman and Storbeck (1995), Schaffnit et al. (1995), Zenios et al. (1995), Soteriou and Zenios (1995) and Lovell et al. (1996).

The second objective of this study is to evaluate the performance of the targets themselves. Setting many targets consumes more resources, in the form of monitoring costs at the bank and compliance costs at the branch offices, than setting fewer targets does. Thus the following question naturally arises: is it possible to reduce the number of targets on which the performance evaluation is based, with some minimally acceptable loss or distortion of information content? If so, the bank can simplify its evaluation procedure with minimal loss of information, and at the same time generate additional resource savings for both itself and its branch offices. It turns out that the linear programming techniques which are used to evaluate branch office performance can also be adapted to the problem of determining the minimal set of targets which remains useful for evaluation purposes. The linear programming techniques, though deterministic in nature, nonetheless provide the foundation for a formal statistical test of the hypothesis that the full set of targets and a subset of targets generate essentially the same performance distribution across branch offices. Hence the linear programming techniques allow us to evaluate the performance of the branch offices and, at the same time, they allow us to evaluate the performance of the bank's target setting procedure.

As far as we know, this is the first study to evaluate target-setting in a financial institution. This is also the first paper which resorts to the "deletion" of variables in a DEA model as proposed by Pastor et al. (1995).

The paper is organized as follows. In Section 2 we introduce the data describing the performance targets, and we provide a descriptive analysis of the ability of the branch offices to meet or surpass these targets. This leads to a preliminary evaluation of the performance of the branch offices, and of the targets themselves. We find a great deal of variation in the ability of branch offices to meet or surpass individual targets, although without a model with which to organize the analysis we are unable to allocate this variation to variation in branch office performance and variation in target setting ability. In Section 3 we introduce our linear programming model of branch office performance, and we provide a model-based evaluation of branch office performance. We then apply our linear programming model to the problem of determining the optimal structure of targets. We find relatively little variation in branch office performance, and we find that the set of targets can be substantially reduced without loss of branch office performance information to bank management. Section 4 concludes.

2. TARGET SETTING AT CAJA DE AHORROS DEL MEDITERRANEO

Bank management currently sets performance targets for over 20 indicators for each branch office in its network. These targets reflect management objectives, and are tailored to prevailing local, regional and national economic conditions. The bank has provided us with data on the target value and the value actually achieved for each indicator for almost every branch office in its network, for the period ending June 30, 1995. After eliminating indicators for which fewer than 500 branch offices reported both target and achieved values, and after eliminating branch offices for which either the target value or the achieved value of an indicator was missing, we ended up with complete information on 17 indicators for 545 branch offices.[3] Our analysis of branch office target performance is based on these success indicators.

Our data set thus consists of target values and achieved values for 17 indicators for 545 branch offices. We have converted each "target value" and "achieved value" pair to a single success indicator, defined as "per cent of target value actually achieved." (As a matter of fact, the managers of the savings bank use these success indicators in their internal reports and refer to them as "coverage of target".) These success indicators are pure numbers, independent of the units in which the underlying indicators are measured, and they range from zero (an achievement of zero) to 100 (exact achievement of the target) to plus infinity (a target of zero). All 17 success indicators, together with summary statistics, appear in Table 1. The success indicators include several deposit types, several loan types, and several miscellaneous services. The first nine indicators are balance sheet items, and the remaining indicators are off-balance sheet items. All but the last indicator are "desirable" services provided by branch offices, desirable in the sense that bank management prefers more to less. The last indicator, delinquencies, is "undesirable," in the sense that less is preferred to more. Consequently for purposes of analysis we convert this indicator to a success indicator by multiplying its reciprocal by 100. A distinguishing feature of the list of success indicators is that it contains items which generate expense or revenue, but it contains no expense items and no revenue items.

The impression one gets from Table 1 is that either the bank is very proficient at setting the majority of its targets, or the majority of branch offices are very proficient at meeting these

[3] The indicators provided by the bank which have been deleted from this study include the value of public sector deposits, public sector financing, union loans, external trade financing, and the number of delinquent borrowers. The first four have been deleted because of missing observations, and the fifth has been deleted at the recommendation of bank management.

targets (without, however, exceeding these targets by an amount sufficient to earn higher targets in the next period). On average, branch offices come within 6% of meeting 11 of 17 targets. In addition, for a different but overlapping set of 12 targets, the success rate is between 44% and 61% among all branch offices. Seven targets have mean success indicators on the range [94, 106] and %Pass on the range [44, 61]. The game between target-setting bank management and target-seeking branch offices has been well-played in these areas, perhaps because these indicators are relatively stable from one period to the next. Indeed, managers of the savings bank have told us that targets which rely mainly on persons as clients are far more stable than targets which rely mainly on firms as clients.

Table 1
Summary Statistics on 17 Branch Office Performance Targets Set by Caja de Ahorros del Mediterraneo, June, 1995

Success Indicator	Man	Min	Max	% Pass	% Fail
Demand deposits	96.1	56.9	145.6	23.8	76.2
High yield demand deposits	106.1	0.0	669.7	44.8	55.2
Time deposits	100.2	57.7	194.5	51.2	48.8
Home purchase deposits	98.2	0.0	667.9	38.3	61.7
Personal loans	101.2	59.6	234.3	51.0	49.0
Credit card loans	97.7	48.6	151.0	40.0	60.0
Mortgage loans	100.5	57.2	163.7	46.8	53.2
Line-of-credit accounts	230.4	0.0	40107.0	53.0	47.0
National commercial discounts	131.5	0.0	5453.7	51.4	48.6
Portfolio management	271.2	0.0	20952.2	54.9	45.1
Pension plans	100.5	27.5	222.7	52.3	47.7
Investment funds	87.1	0.0	239.5	18.5	81.5
Insurance policies	101.7	69.2	197.6	50.5	49.5
Number of persons with direct deposits	101.2	71.3	158.6	60.5	39.5
Number of persons with credit cards	94.8	59.6	121.6	17.1	82.9
Co-signed loans	187.6	0.0	17044.6	45.3	54.7
Delinquencies	1272.6	6.0	36987.0	44.4	55.6

The average performances alluded to in the preceding paragraph suggest that both target-setting and target-meeting have been generally successful. However the frequency distributions of branch office performance on the 17 success indicators behave in a variety of ways. For

example, the distribution of branch office performance on the demand deposits target is centered about a mean value of 96, but has such a small variance that only 24% of branch offices managed to meet their target. The distributions for investment funds and credit card ownership behave similarly. Other distributions exhibit much larger variance, with enormous ranges, suggesting lots of under-achievement by wide margins and lots of over-achievement by even wider margins. (Once again, the targets which vary more wildly, such as line of credit accounts, delinquencies, portfolio management and co-signed loans have firms as usual clients as opposed to persons.) This is unsurprising, given the enormity of the task of setting 17 targets for nearly 600 branch offices. Moreover, performance is highly skewed for three success indicators: only 23.9% of branch offices met their demand deposit target, only 18.5% of branch offices met their investment funds target, and only 17.1% of branch offices met their credit card ownership target. This suggests that these targets may have been set too high for the majority of branch offices. As a consequence, it is difficult to form a general impression of the success of branch offices in meeting their targets, and it is equally difficult to form a general impression of the success of the target-setting procedure itself.

A frequency distribution of the number of branch offices meeting or surpassing various numbers of targets appears in the first column of Table 2. No branch office succeeded in meeting as many as 15 of 17 targets. The rest of the distribution is approximately normal, with mean of 7.4 targets met or exceeded.

Three conclusions emerge. First, seven of 17 targets seem to have been set rather well, in the sense that the mean rate of target achievement is close to 100% and roughly half of all branch offices have come very close to meeting their target. These include those for time deposits, personal loans, mortgage loans, pension plans, and direct deposits. Second, other targets have not been set so well, in the sense that only a small proportion of all branch offices have succeeded in meeting their targets. These include those for demand deposits, investment funds and credit card ownership. Third, a proper analysis of branch office performance in meeting their targets, and of target setting performance itself, requires a model-based approach. It is not possible to reach any general conclusions with a piecemeal approach. We develop such a model-based approach in the next Section.

Table 2
Frequency Distribution of Branch Office Success in Meeting Targets

	Number of Branch Offices	
Number of Targets Met or Surpassed	17 Target Model	7 Target Model
17	0	---
16	0	---
15	0	---
14	2	---
13	6	---
12	16	---
11	29	---
10	45	---
9	80	---
8	85	---
7	85	1
6	76	6
5	58	63
4	31	111
3	25	153
2	6	104
1	1	92
0	0	15
Mean	7.4	2.9

3. A DEA-BASED ANALYSIS OF THE PERFORMANCE OF BRANCH OFFICES AND OF THE BANK'S TARGETS

In this Section we subject the target achievement data summarized in Table 1 to a DEA analysis. The first objective is to obtain a performance evaluation of the branch offices. This exercise is typical of many DEA studies, both within and outside the financial services sector.[4]

[4] DEA and regression-based studies of performance in the financial services sector are surveyed by Colwell and Davis (1992) and by Berger, Hunter and Timme(1993). The most recent and complete survey is due to Berger and Humphrey (1996).

The second objective is to obtain a performance evaluation of the target setting system. This exercise is new.

In the first exercise we assume that branch office managers attempt to maximize the services they provide. We also assume that the services they provide consist of the numerators of the 17 indicators listed in Table 1. The denominators of these indicators are fixed, since they are the targets set by the bank, and so this assumption is equivalent to the assumption that branch office managers seek to maximize the success indicators listed in Table 1. Of course this ignores the possibility that branch office managers might sandbag in an effort to minimize the possibility of receiving higher targets next period, but we consider this possibility remote. To the extent that bank management attention focuses on the bottom rather than the top of the performance distribution, this possibility is also largely irrelevant.

This success indicator maximization problem is ideally suited to a DEA analysis. Let the vector of success indicators for branch office j be denoted $y^j = (y^{1j},...,y^{17j})$, $j = 1,...,545$. Each element of y^j is the ratio of an achieved to a target value, and so is units-free. The maximization assumption leads to the linear programming problem

$$\max_{\phi,\lambda} \ \phi \quad \text{subject to} \quad \phi y^{ij} \le \sum_k \lambda_k y^{ik} \qquad i = 1,....17$$

$$\lambda_k \ge 0 \qquad k = 1,...,j,...,545$$

$$\sum_k \lambda_k = 1,$$

where i indexes the success indicators, k indexes the branch offices, and $\lambda = (\lambda_1,...,\lambda_k,...,\lambda_{545})$ is a vector of intensity variables. This is a simplified version of the Banker, Charnes and Cooper (1984) output-oriented DEA model. The objective of the problem is to maximize the radial expansion of the vector of success indicators for the branch office being evaluated. The constraints of the problem limit this expansion to a convex combination of success indicators of other branch offices in the sample. Thus branch office managers select a mix of success indicators, and this mix is allowed to vary from one branch office to another, reflecting variation in the age, size and location of branch offices and the demographic composition of their customers. The maximization problem then determines the proportion by which the success indicators can be feasibly expanded in each branch office. Of course, we are assuming that the targets fixed for each office by the bank managers accurately reflect the features of each office's

operating environment. On page 8 we comment more on this point and reveal that target setting is not an easy task for certain indicators.

The solution to the maximization problem provides a comprehensive performance indicator for branch office j, the optimal value of ϕ.[5] Optimal $\phi^* = 1$ suggests best practice performance, since it is not possible to expand all success indicators equiproportionately without exceeding best practice observed in the sample. Optimal $\phi^* > 1$ suggests something less than best practice performance, since it is possible to expand all success indicators equiproportionately to $\phi^* y_j$, or by $100¥(\phi^* - 1)\%$, without exceeding best performance observed in the sample. The larger the value of ϕ^*, the weaker the performance. It is important to note, however, that ϕ measures *relative* performance, performance relative to other branch offices in the sample. It is possible that $\phi^* = 1$ for a branch office which fails to meet any of its targets if no other branch office performs better, just as it is possible for a branch office to surpass all of its targets and still receive a score of $\phi^* > 1$ if other branch offices perform better.[6]

We have solved this problem for all 545 branch offices, using all 17 success indicators. Results are summarized in the first column of Table 3, which reports percentile values of the frequency distribution of efficiency scores. There is remarkably little variation in the overall performance of the branch offices. Just over 11% of the branch offices are radially efficient, best practice offices. This does not imply that they performed exceptionally well, or that they managed to meet or surpass all or even most of their 17 respective targets. It merely means that they performed best in the sample. On average, these 60 best practice branch offices met or surpassed just 9 of 17 targets, with a range of from 2 to 13 targets met or surpassed. The mean and median of the distribution are nearly identical, and suggest that fully half of the branch

[5]The radial efficiency score is a comprehensive performance indicator provided that slacks (or nonradial inefficiencies) are small. This is exactly what happens in this paper. Alternatively, if the values of the slacks are relevant, the efficiency scores must be replaced by a "global efficiency measure" (see Cooper and Pastor (1995)). For an application which resorts to the same programming problem as here but which needs to switch to a global measure, see Lovell and Pastor (1994).

[6]As we have pointed out, ϕ measures performance relative to the branch offices of Caja de Ahorros del Mediterraneo in the sample. "However, by searching for data on industry benchmarks ... , and using these to extend the reference set by constructing standard DMUs, the bank may find that there is a much larger room for improvement than previously estimated" (quoted from Golany and Roll (1994), p.315). Although this was not a task set forth by the savings bank managers, we note that this is an alternative way of setting targets. The method presented in this paper considers targets by means of the variables of the DEA model, while the method proposed by Golany and Roll considers targets through the addition of DMUs to the initial sample. The method of adding artificial DMUs has also been proposed by Thanassoulis and Allen (1994) in a rather different context.

offices are capable of less than a 9% improvement in performance. Even the worst-practice branch offices are incapable of a 30% improvement in their performance. Part of the homogeneity is attributable to the high dimensionality of the problem, which allows branch offices considerable opportunity to perform well through specialization. However we shall soon see that the high dimensionality of the problem is not by itself responsible for the narrow range of branch office performance.

Table 3
Distribution of Branch Office Target Efficiencies, by Percentile

	Efficiency Scores	
Percentile	17 Target Model	7 Target Model
10	1.000	1.045
20	1.045	1.072
30	1.063	1.086
40	1.075	1.097
50	1.087	1.109
60	1.099	1.121
70	1.109	1.130
80	1.122	1.142
90	1.142	1.162
100	1.289	1.417*
Number of Efficient Branch Offices (%)	60 (11%)	19 (3.5%)
Mean Efficiency Score	1.086	1.108

* Only three branch offices have ¿* > 1.289, the worst score in the 17 target model

We turn next to an evaluation of the target system itself. Our evaluation of the branch offices has been based on the list of 17 success indicators extracted from a longer list employed by the bank for much the same purpose. We are interested in determining whether the list of success indicators can be shortened without statistically significant loss of information. If the list can be shortened with insignificant loss of information, then potentially significant resource savings can be realized, in the form of reduced monitoring costs at the bank and reduced compliance costs at the branch offices. The following variable deletion test, recently developed by Pastor, Ruiz and Sirvent (1995), provides a test of the hypothesis that a variable, or a subset of variables, can be deleted from the variable list in a linear programming performance evaluation problem such as ours, without statistically significant loss of information. Although

statistical significance is not synonymous with managerial usefulness, we take the view that bank management would consider it useful to know which success indicators can, and which success indicators cannot, be deleted from the list without statistically significant loss of performance evaluation information.

In the first step of the variable deletion test the linear programming problem is solved for all 545 branch offices, using all 17 success indicators. In the second step, the same linear programming problem is solved again for all 545 branch offices, this time using fewer success indicators. The mathematics of the problem guarantees that performance in each branch office will either remain unchanged or decline when success indicators are deleted, since their deletion results in fewer constraints appearing in the linear programming problem. The third step consists of a statistical comparison of the two distributions of the 545 performance evaluations (the pairs of optimal ϕ^*s obtained from the solutions of the two linear programming problems). The question is whether the performance of some branch offices declines more dramatically than that of other branch offices when some success indicators are deleted. If it does, the performance distribution is distorted by the deletion of the success indicators, a significant amount of managerially useful information is lost, the candidate success indicators for deletion are therefore "influential," and they are not deleted. If the performance distribution does not change in a substantial way, an insignificant amount of managerially useful information is lost, the candidate success indicators for deletion are "superfluous" and are deleted, and potentially large resource savings can be realized. This procedure continues until no success indicator or group of success indicators can be found whose deletion would not seriously distort the performance distribution. The outcome is a linear programming model of performance evaluation based on the minimal number of influential success indicators, which generates a distribution of efficiency scores which is not statistically different from that obtained from a model based on the full set of 17 success indicators.

We have applied this variable deletion test procedure to the set of 17 success indicators appearing in Table 1. Our initial selection of candidates for potential deletion was guided by the ["max" - "min"] range for each success indicator. Most of the ranges seem reasonable, but five success indicators have ranges well in excess of 5,000. These seem unreasonable, and suggest that target setting in these areas is either extremely difficult or poorly executed. These five success indicators also have mean values far in excess of what would be expected from the entries in the "% Pass" column. Thus in the second step we deleted five success indicators: line of credit accounts, national commercial discounts, portfolio management, cosigned loans, and delinquencies. We re-ran the linear program for all 545 branch offices, using this reduced set of

12 success indicators. The number of efficient branch offices declined from 60 to 42, and the range of efficiency scores increased slightly, from [1.0, 1.289] to [1.0, 1.295]. Moreover, the two performance distributions remained virtually unchanged, suggesting that there is no statistically significant difference between the branch office performance distribution based on the original set of 17 success indicators and the branch office performance distribution based on the reduced set of 12 success indicators. Stated differently, the probability is less than 0.00001% (1 in 10,000,000) that the information content of the reduced set of 12 success indicators differs from the information content of the original set of 17 success indicators. We conclude that if bank management wants to evaluate the performance of branch offices, they can obtain the same information from 12 success indicators as they can from 17 success indicators. The five deleted success indicators are superfluous.

We then conducted a second variable deletion test. Two of the surviving success indicators (high yield demand deposits and home purchase deposits) have much larger ["max" - "min"] ranges than do the 10 other surviving success indicators. They also have much higher mean values than would be expected from their entries in the "% Pass" column, suggesting that both distributions are highly skewed. We re-ran the linear programming problem for all 545 branch offices, using this reduced set of 10 success indicators. The number of efficient branch offices declines further, from 42 to 33, and the range of efficiency scores again widens slightly, from [1.0, 1.295] to [1.0, 1.310]. A formal test procedure leads to the conclusion that there is no statistically significant difference between the branch office performance distribution based on 17 success indicators and the branch office performance distribution based on 10 success indicators. The probability that the two performance distributions differ significantly is again less than 0.00001%. Bank management can obtain the same performance information from 10 success indicators as they can from 17 success indicators.

We continued with this variable deletion test procedure, deleting one success indicator at a time, until it was no longer possible to delete a success indicator without significant alteration in the branch office performance distribution. We ended up with a model containing just seven success indicators. The number of efficient branch offices declines from 33 to 19, the range of efficiency scores widens slightly from [1.0, 1.310] to [1.0, 1.420], and the mean efficiency score increases from 1.086 to 1.108. The performance distribution based on seven success indicators is otherwise unchanged to any statistically significant degree from the original performance distribution based on 17 success indicators, as can be verified by comparing the two columns of Table 3. It follows that the bank can, if it wishes, evaluate the performance of its branch offices on the basis of their ability to meet seven influential targets, each of which

contains independent information, rather than on the basis of the original set of 17 targets, 10 of which are superfluous and contain no independent information.[7]

The seven influential targets and the 10 superfluous targets are listed in Table 4. The seven influential targets include a pair of deposit categories, three loan categories (including both credit card categories, attesting to their growing importance), and two additional categories.[8]

Table 4
Influential and Superfluous Success Indicators, Target Model

Influential Success Indicators	*Superfluous Success Indicators*
Time deposits	Demand deposits
Credit card loans	High yield demand deposits
Mortgage loans	Home purchase deposits
Pension plans	Personal loans
Investment funds	Line of credit accounts
Direct deposit ownership	National commercial discounts
Credit card ownership	Portfolio management
	Insurance policies
	Co-signed loans
	Delinquencies

Our final evaluation of branch office performance has already been described in brief. It is based on a list of success indicators which has been reduced from the original 17 indicators to seven. It is important to repeat that this shorter list contains the same information content as the original list does, to a very high degree of statistical confidence. The results of the branch office performance evaluation are summarized in the second columns of Tables 2 and 3. On

[7]The comparison of each reduced model is performed each time with respect to the same inclusive model containing the entire set of variables, as explained in Pastor et al. (1995). Nevertheless, we prefer to show the differences between two consecutive reduced models in order to appreciate the sequential evolution of the deletion test.

[8]The fact that both credit card categories remain in the final model can be explained by looking at the statistics in Table 1. Credit card loans has a "normal" behavior, with 40% pass, as opposed to number of persons with credit cards, with only a 17.1% pass. Just the reverse situation arises if we focus on the Max-value. The conclusion is that the target "number of persons with credit cards" was difficult to achieve and that branch managers gave larger than anticipated loans to these credit card holders.

average, branch offices manage to meet or surpass almost three of seven influential targets, and the frequency distribution is bell-shaped. The dispersion of efficiency scores is marginally higher with the reduced set of seven influential success indicators than with the original set of 17 indicators. However 50% of all branch offices remain within 11% (rather than 9%) of best practice, and the least efficient branch offices remain within 42% (rather than 29%) of best practice. Even a range as wide as 42% between best practice and worst practice is unusually narrow, and suggests that an accommodation has been reached between bank management, which sets targets, and the vast majority of branch offices, which strive to meet targets. Nonetheless, our analysis strongly suggests that roughly the same performance evaluation outcome could have been reached, at considerably reduced cost, had it been based on a carefully reduced number of influential targets.

4. SUMMARY AND CONCLUSIONS

This analysis has generated two sets of findings. The first concerns the ability of branch offices to meet the targets set by the bank. Descriptive analysis of the data showed that branch offices are very proficient at meeting roughly half of the targets set by the bank; their proficiency at meeting the remaining targets varies wildly. The extreme cases correspond to objectives which involve firms rather than persons as clients. A model-based analysis showed very little variability in the ability of branch offices to meet the range of targets set by the bank. Success indicator efficiency scores ranged from 1.0 (best practice) to 1.29 (worst practice). This suggests that branch offices are generally able to offset relatively weak performances in some target areas with relatively strong performances in other target areas. Nonetheless, an overall ranking of 545 branch offices emerged, and this ranking should be of considerable interest to bank management. The second finding concerns the value of the set of targets used by the bank. We employed a new variable deletion test procedure to test the hypothesis that a particular target is superfluous. If it is superfluous, it can be deleted from the set of targets used to evaluate the performance of branch offices without loss of information to bank management. In this event the two distributions of branch office performance scores are statistically indistinguishable. We conducted a battery of statistical tests, and ended up being able to reduce the set of targets from 17 to seven; we were able to delete 10 targets because they provided no independent branch office performance evaluation information of their own. This finding offers a way for bank

management to reduce the monitoring and compliance costs of operating its target setting procedure.

The exercise has been based on detailed branch office information provided by bank management. The variable list benefited from frequent discussions with bank management. Nonetheless, potentially useful information was unavailable to us. This information concerns the characteristics of the operating environment in which branch offices seek to meet targets. Information on operating environment characteristics such as the population in the surrounding area of each branch, the age of each branch, the degree of competition in each branch's neighborhood, and so on, would prove useful in leveling the playing field prior to conducting both analyses. Techniques for incorporating such characteristics prior to the analysis have been developed, and applied successfully to branch office performance evaluation, by Pastor (1994). A final point is worth mentioning: we have consider a constant input for each office in the corresponding DEA model, which means that bank managers take into account the different amount of resources needed by each office when they set the value of the targets. Hence, input information is supposed to be embedded in the output values, which justifies our model selection.

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