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Assessing Customer Recommendations in MBA Programmes

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Abstract

The image of an academic program is an important factor explaining the number of recommendations made by its current students to future students. The investigation reported in this paper analyzes cross-sectional data on MBA students of one academic program. It attempts to gain insights about program quality from the analysis of student's recommendations regarding their MBA education. The participants' decision to recommend the program to potential clients is dependent, among the other things, on customer care and academic grades given by the participants. A new estimator is derived to take unobserved individual variations between respondents into account in binary logit models.

1. INTRODUCTION

The objective of this study is to gain a better understanding of customer recommendations for professional services. Satisfied customers are willing to suggest the services to potential clients. Recommendations are a means of forming a reputation, which is an important factor when students apply for university. This is very important regarding management education, because management programmes are expensive compared to ordinary studies at university.

Cross-section data are used in this study to analyse the factors affecting the recommendations. The data are based on a survey made of the participants of an executive Master of Business Administration (MBA) programme. A questionnaire was sent by mail to the participants of the programme in 1995.

Logit models are used to study the factors which affect the decision to recommend the programme. Many statistically significant explanatory variables are found. These variables are related to the motivation and satisfaction of the participants. The total grading given by

the participants is an important explanatory variable, which is positively related to the probability of the recommendation. Regarding the management and marketing of an education centre, it is interesting to notice that customer care is an important factor which explains the decision to recommend.

Additionally, someone who has recommended the programme once may also repeat the recommendation again. This is a separate decision which depends on other factors than the initial decision to recommend. The frequency of such recommendations increases with the length of the relationship and the image of the education centre.

2. THEORETICAL BACKGROUND

It has generally been acknowledged that education improves a person's position in the labour market. Much attention has been paid on the effects of education (e.g., [Kettunen, 1997](#)). This study attempts to increase the knowledge about the factors which affect the process by which students make up their minds and apply for continuing education.

According to [Kotler \(1988, p. 478\)](#) management education can be classified as a professional service. It is supplemented by the skilled labour of the programme secretaries. [Day and Barksdale \(1992\)](#) point out that customer satisfaction with a service depends on it being consistent with that customer's criteria for service quality. The quality of professional services cannot be evaluated according to any particular factor or characteristic, as pointed out by [Morgan and Piercy \(1992\)](#). The quality of management education in particular needs is to be considered from the point of view of the customers, because the contents and objectives of management education are planned to satisfy their needs, and because the education is financed by their payments. In this study customer satisfaction is measured by the total grading for the MBA programme given by the participants.

An important aspect of educational services is that the customers make up their minds regarding the service quality before they can be certain about it. In these circumstances, it is generally acknowledged that the objective quality may not be as important as the subjective experience of the customer ([Morgan & Piercy, 1992](#)). Image is a filter which affects the values customers place on their experience of the service. The image of the education centre is therefore a very important factor which has to be taken into account in the empirical study.

Previous results in the context of job seeking persons suggest that TQM status, per se, has little effect on applicant attraction. Rather, attraction to firms seems to operate almost exclusively through applicant perceptions of potential coworkers, supervisors, and job characteristics ([Rynes 1991](#); [Rynes, Bretz, & Gerhart, 1991](#)). If similar reasoning is valid for persons seeking for management education it would seem that developing cultural and learning aspects of quality will result in good prospects of attracting applicants.

Logit models

In this section a binary logit model of recommendations is examined. Special attention is paid to the problems of dealing with the variety of individual differences between respondents that have not been individually noted and specified, any of which might explain some of the variance. The procedure presented here is important, because there are no exhaustive theories or complete explanatory variables regarding the recommendations. Indeed, the relative importance of all the factors involved cannot even be suspected.

Initially, the probability of the alternative 1 can be written using the well-known expression as follows

$$p(1|x, \beta) = \frac{\exp(x\beta)}{1 + \exp(x\beta)} \quad (1)$$

where x is an $(N \times k)$ matrix of explanatory variables having information about N respondents, and β is a $(k \times 1)$ vector of k coefficients. In this binary logit model there is a single regressor vector, and one parameter vector for an individual.

A variant of the logit model (1) is called a discrete choice model, where the J alternatives are characterised by J sets of regressors related to each of the choices and a single parameter vector (McFadden, 1974, 1976, 1984). Regardless of the number of choices, there is a single $(k \times 1)$ vector of parameters to be estimated. That model is sometimes also called the random utility model. The extended logit model developed in this paper is inspired by a similar extension by Chesher and Santos Silva (1992) in the context of discrete choice models.

In our case, however, because of the range of unobservable individual differences discussed earlier in this section, there are no appropriate data to estimate a discrete choice model. The differences between the data we do have and the formulations of both models are therefore our reasons for applying a small variance approximation to the logit model.

Put another way, for the purposes of dealing with our particular data, the model appears as if it is "misspecified" in such a way that the explanatory variables do not control completely for the differences between the respondents. One reason for this is that the explanatory variables of the logit model do not take different values between the alternatives, as in the discrete choice model.

Let us assume, therefore, that these unobserved differences between respondents can be represented by a random term u which is additive to the observed heterogeneity of the sample. The term u can be interpreted either as intrinsic differences between respondents, or as measurement error in the regressors x or the dependent variable. (For a discussion see Lancaster (1983, 1985) and Chesher (1991).) The conditional choice probabilities given x and u can be written as follows:

$$p(1|x, \beta, u) = \frac{\exp(x\beta + u)}{1 + \exp(x\beta + u)} \quad (2)$$

The conventional logit model assumes that the utilities of different individuals are independently distributed. This assumption is hardly met in the real world, since the unobserved characteristics involved may be correlated among the individuals who have chosen a particular alternative. "Unobserved heterogeneity" of this kind has usually been neglected for the sake of convenience, as pointed out by Amemiya (1981). Apparently one reason is the difficulty in specifying the correct structure of the neglected set of differences.

Since u is unobserved, the relevant marginal density can be written as follows

$$\bar{p}(1|x, \beta) = \int_{-\infty}^{\infty} p(1|x, \beta, u) f(u|x) du, \quad (3)$$

where $f(u|x)$ is the density function of u given x . The functional form of $f(u|x)$ is generally unknown.

In order to avoid imposing any specific form for the function $f(u|x)$, a small variance approximation is derived. It is obtained by expanding $p(1|x, \beta, u)$ in a second order Taylor series in u , and integrating u . It gives the following approximation

$$p(1|x, \beta) = p_1 + 0.5 \sigma p_1 + o(\sigma^2), \quad (4)$$

where σ is the variance of the unobserved heterogeneity, $p_1 = p_1(1 - 3 p_1 + 2 p_1 p_1)$ and $p_1 = p(1|x, \beta)$. The variance σ is a scalar. The remainder term $o(\sigma^2)$ is of negligible magnitude. The approximation (4) cannot, however, be used in this form as the basis for estimating the unknown parameters, since it does not in general lie in $(0, 1)$.

In order to obtain an expression which lies in $(0, 1)$ and has a first order Taylor series in σ identical to (4), consider the following choice probability

$$g(1|x, \beta, \sigma) = \frac{\exp(x\beta + r\sigma)}{1 + \exp(x\beta + r\sigma)} \quad (5)$$

In the appealing formula (5), the puzzling interest is in the new unknown term r , which is worth examining more closely.

The first order Taylor series expansion of $g(1|x, \beta, \sigma)$ can be written as follows

$$g(1|x, \beta, \sigma) = p_1 + r \sigma p_1(1 - p_1) + o(\sigma^2). \quad (6)$$

Setting (4) equal to (6) gives the needed expression for the unknown term r , which can simply be written as $r = 0.5 - p_1$.

Substituting $0.5 - p_1$ for r in equation (5) leads to an extended binary logit model which can be written as follows

$$g(1|x, \beta, \sigma) = \frac{\exp[x\beta + (0.5 - p_1)\sigma]}{1 + \exp[x\beta + (0.5 - p_1)\sigma]} \quad (7)$$

Formula (7) allows one to identify the variance of the "unobserved heterogeneity", σ .

The likelihood contribution of a conventional logit model can be written using the indicators y_i , $i = 1, 2$, valued zero or unity as follows

$$L = \prod p(i|x, \beta)^{y_i}, \quad (8)$$

where the product is over the choices, $i = 1, 2$. Correspondingly for the extended logit model the likelihood function can be written as follows

$$L_e = \sum_{i=1}^n \log \left(\frac{L_i}{L} \right)^{\omega_i}, \quad (9)$$

It is easy to verify that $\log L / \beta = \log L_e / \beta$ if $\omega = 0$. Equations (8) and (9) are used in the estimations of this study.

3. EMPIRICAL EVIDENCE ON RECOMMENDATIONS

Data

A questionnaire was sent by mail in May 1995 to all of the 219 active MBA students of the Advanced Management Education Centre of the University of Jyväskylä. During the following two weeks 43 per cent of the questionnaires were returned. After a reminder by telephone a total of 65 per cent of the questionnaires were returned. Some of the questionnaires were not completely filled in, and the observations with missing values were left out of the study. Thus the final sample includes 110 observations. An extensive description of the data is found in Sajasalo (1997).

Table 1 presents the descriptive statistics of the cross-section data. The rate of recommendations is rather high, because 63 per cent of the participants have recommended the MBA programme to a potential client. The average number of recommendations is 3.16 overall and 5.04 among the persons who have recommended the programme.

About 39 per cent of the persons were studying in programmes which were customised to big companies. The rest of the students had individually applied for the MBA programme. About 75 per cent of the students had applied for the programme on their own initiative: however, some of these persons had applied for one of the customised programmes, in which the formal "client" is not just one person, but a selection committee.

The number of previous courses in continuing education undertaken by the participants is also generally rather high, with an average value of 5.15 courses. Thus the participants have adequate experience by which to evaluate their continuing education.

The importance of contacts with personnel of the education centre takes an average value of 2.30 on the scale 1–4 (not important – very important). Contact is thus a rather meaningful factor for customer satisfaction.

The average number of other education centres considered when the student applied for the programme is 0.78, which is a rather low figure. Most persons in fact have considered only one alternative (the one they applied for), which is partly due to the existence of the customised organisational programmes described above.

The importance of the image of the education centre for customer satisfaction is also a rather important factor. It takes an average value of 2.25 on the scale 1–4 (not important – very important). The questionnaire however contained no definition of image, which is therefore not necessarily a conceptually univocal term as used by the respondents.

The age of the participant varies between 25 and 57 years with an average value of 41.55 years. The average age of the students is rather high because of the nature of the executive MBA programme.

About 19 percent of the participants are from manufacturing companies and 71 percent of them are from service companies. About 39 percent of them are middle managers and 48 percent are senior managers. The rest of the participants are technical or professional experts of various kinds.

The average number of credits is 19.75. It is half way to the total minimum credits of 40. This was expected, because in a stationary process, on average, the participants are observed halfway through their educational period.

The total grading given by the participants varies between 6.5 and 10 on the scale 1–10, and the average grading takes a value of 8.34. The total grading represents the customer satisfaction, which is thus generally rather good. [Table 1](#).

Table 1
Descriptive Statistics of the Cross-Section Data

Variables	Mean	Std.Dev.	Min.	Max.
Customer recommended the programme, 1= yes	0.63	0.49	0	1
Number of recommendations	3.16	4.66	0	25
Customised programme, 1=yes	0.39	0.49	0	1
Own initiative, 1=yes	0.75	0.44	0	1
Number of previous courses in continuing education	5.15	6.13	0	40
Importance of contacts with personnel on the scale 1-4	2.30	0.96	1	4
Number of other education centres considered when the student applied for the programme	0.78	1.17	0	5
Importance of the image of the education centre on the scale 1-4	2.25	0.76	1	4
Age of the participant, years	41.55	6.29	27	57
Manufacturing company, 1=yes	0.19	0.39	0	1
Service company, 1=yes	0.71	0.46	0	1
Middle manager, 1=yes	0.39	0.49	0	1
Senior manager, 1=yes	0.48	0.50	0	1
Number of credits	19.75	10.79	0	42
Total grading given by the participant on the scale 1-10	8.34	0.75	6.5	10

Results of Estimations

A two-stage approach is used to estimate the results. In the first stage logit models have been used to analyse the factors affecting the decision to recommend and in the second stage models of ordinary least squares have been estimated, conditional on the recommendations, to analyse the factors affecting the frequency of recommendations.

[Table 2](#) presents the results of the estimations of the logit models. The participants in the customised programmes for the big companies are less likely to recommend the MBA

programme than the others. On the other hand the persons who have started their studies on their own initiative are more prone to recommend the education centre. This is in line with the nature of the customised programme, where some participants have applied for the programme on the initiative of their superiors.

The importance of contacts with the personnel of the education centre has an interesting coefficient. Those participants having many contacts have a higher propensity to recommend the programme than the others. Good care of students is thus important from the point of view of marketing, because the contacts increase the satisfaction and the probability of recommendations.

The probability of recommendations increases with the age of the participant. This may reflect the need for continuing education, because the persons who have a long time away from their studies are probably in greater need of education.

The persons on the expert level have larger probabilities of recommendations than the others. The middle managers are less likely to recommend than the experts, and the senior managers have the lowest intensities of recommendations. This is in line with the organisational structure and the number of colleagues. Senior managers have fewer colleagues to recommend the programme to.

The total grading given by the participants is positively related to the probability of recommendations. The grading given on the scale 1-10 describes the satisfaction of the participants. Each higher level of the total grading increases the probability of recommendations.

It turns out, as we expected, that there is indeed an “unobserved heterogeneity” across the individuals in the logit model. The variance of the unobserved heterogeneity takes a statistically significant value. The absolute values of most parameter estimates and the log likelihood increase when the neglected unobserved heterogeneity is taken into account. [Table 2.](#)

Table 2
Results of the Estimations of the Logit Models*

(A) Conventional logit model		
(B) Extended logit model allowing for unobserved heterogeneities		
	(A)	(B)
Constant	-10.96	-41.09
	(4.78)	(10.40)
Customised programme, 1=yes	-2.06	-5.48
	(0.71)	(1.56)
Own initiative, 1=yes	1.53	5.63
	(0.45)	(1.42)
Importance of contacts with personnel on the scale 1-4	0.63	1.57
	(0.43)	(0.68)

Age of the participants, years	0.07	0.41
	(0.06)	(0.13)
Organisational position:		
Expert (reference group)		
Middle manager, 1=yes	-1.00	-0.84
	(0.92)	(1.70)
Senior manager, 1=yes	-2.11	-5.58
	(0.95)	(1.92)
Total grading given by the participant on the scale 1-10	1.02	2.90
	(0.42)	(0.80)
χ^2		6.35
		(1.46)
Log-likelihood	-44.96	-42.24

*The standard errors are given in parentheses.

[Table 3](#) presents the results of the estimations of the models using the method of ordinary least squares. The number of recommendations is the dependent variable. The estimation carried out is based on the condition on that the persons involved have recommended the programme at least once. Technically this is achieved by including the inverse of Mill's ratio among the explanatory variables, and estimating the model for a sample of 69 persons who have recommended the programme. The method has been developed by [Heckman \(1974, 1979\)](#) and [Lee \(1983\)](#).

Any increase in importance of the image of the education centre for the customer organisation increases the number of recommendations. The recommendations are also a way to increase the positive image of the participants themselves, and of their organisation. According to the results, each higher level of the importance of image expressed on the scale 1-4 increases the number of recommendations by one.

The number of previous courses in continuing education is positively related to the number of recommendations. The positive attitude to continuing education of such participants is a plausible explanation for this relationship. More research is, however, needed to investigate this assumption.

The number of alternative education centres considered when the student applied for the MBA programme is negatively related to the number of recommendations. If the participants have examined the curricula of other education centres, they are less likely to recommend the programme of the Advanced Management Education Centre.

The persons from service companies clearly recommend the programme more seldom than the persons from manufacturing companies, public sector and other sectors. One explanation of this is that the curriculum for the persons from the service companies is usually different from the curriculum for the other persons.

The number of recommendations increases with the number of credits obtained by the participants. This result has a natural explanation. When time passes and credits are successfully obtained, the number of recommendations increases, because the participants become increasingly satisfied with the programme. The number of credits is a variable which affects the number of recommendations, but it does not explain the actual decision to recommend. A similar result was found by Boyle et al. (1992) who studied the influence of strategies in marketing. They found that the frequency of recommendations and information exchange are positively associated with the continuation of the relationship.

The coefficient of the inverse of Mill's ratio (sigma) shows the effect of the sample choice on the results. It appears that this effect is positive. Therefore the correction of the sample selection bias is essential. The number of recommendations depends positively on the decision to recommend. [Table 3.](#)

Table 3
Results of the estimations of the models using the method of ordinary least squares *

Variables	
Constant	2.24
	(2.63)
Importance of the image of the education centre on the scale 1-4	1.00
	(0.65)
Number of previous courses in continuing education	0.16
	(0.08)
Number of other education centres considered when the student applied for the programme	-0.84
	(0.43)
Sector:	
Public sector and other sectors (reference group)	
Manufacturing, 1=yes	-0.46
	(2.18)
Service, 1=yes	-3.57
	(1.56)
Number of credits	0.17
	(0.05)
(sigma)	2.34
	(1.27)
R ²	0.41

*The standard errors are given in parentheses.

4. CONCLUSIONS

The two-stage procedure has been widely used in empirical studies to correct the sample selection bias as a specification error. Little attention has been paid to the specification at the first stage of the procedure. In this case, a procedure to take into account the unobserved variations between individual respondents was derived and successfully applied. It turned out that across the individuals there was indeed such "unobserved heterogeneity", which was not sufficiently controlled by the explanatory variables.

Unlike other studies, this research focused on the different stages of customer recommendations regarding management education. The first stage is the decision to recommend. The second stage is the frequency of recommendations. It turns out that these stages have different explanations.

The students who do not take part in the firm-specific customised programmes, but who have individually applied for the MBA programme on their own initiative, are willing to suggest the programme to other potential students. They are not, however, more active than others in making further recommendations. The importance of contacts with the personnel of the education centre increases the probability of recommendations. Older persons have higher intensities of recommendations than the others, but on the other hand each higher organisational level decreases the intensity of recommendations. A high total grading given by the participants of the MBA programme leads to a high probability of recommendations.

The importance of the image of the education centre is a significant factor increasing the number of recommendations. The number of previous courses in continuing education is positively related to the recommendations. On the other hand the number of other education centres that the participant has considered is negatively related to the number of recommendations. The participants from the service companies recommend more seldom than the others. The continuing relationship with the education centre increases the number of credits, which in turn increases the number of recommendations.

Regarding the management of the education centre, the results of this study support the enhancing of customer care and increasing the number of contacts with students. The contacts increase the probability of recommendations, and they are positively correlated with the total grading given by the participants. The total grading in turn increases the number of recommendations. The firm-specific customised programmes have not been successful in increasing the number of recommendations.

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