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Financial assistance for study abroad students: An economic analysis

Donald Lien [a,*], Gang Liu [b]

[a] College of Business, University of Texas, San Antonio, United States
[b] School of Business, Renmin University of China, China

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ABSTRACT

This paper examines the scholarship payback policy embedded in a study abroad program. A full payback policy requires a student to return the whole amount of the scholarship should he fail to achieve a target post-program performance, whereas a partial payback policy requires a payback amount in proportion to the extent of the under-performance. It is found that, the university should adopt a fixed amount scholarship to maximize the average post-program ability. There is also an optimal partial payback policy.

1. Introduction

Most universities provide scholarships to reduce the cost of study abroad programs and henceforth promote student participation in these programs. For example, At University of Texas, Austin, preference is given to their programs based on merit and financial need and awards are approximately $1000 per student. At University of Texas, San Antonio, the award ranges from $500 to $3000 per student based on need and merit for any program. Iowa State University College of Business offers scholarships from $100 to $2000 for applicants with GPA above 2.5 for undergraduate students and above 3.0 for graduate students. At Indiana University, study abroad scholarship is up to $3000 for the academic year and $500–$750 for summer for school sponsored programs. The award is based on financial need and merit. Michigan State University Eli Broad College of Business offers $200–$2000 to their own programs to applicants with GPA over 3.0.

While a majority of students are motivated by enhanced learning opportunities in foreign countries, some students choose to study abroad for consumption purposes. As a result, there will always be cases that students return to the home institutions with less than satisfactory performance. In response, the university may institute a scholarship payback policy to reduce the incentives for taking up study abroad scholarship for personal consumption purposes. This paper constructs a theoretical framework to analyze the effects of full payback and partial payback policies on study abroad programs.

The full payback policy chooses a target post-program performance level such that any student failing to achieve this level must pay back the full amount of the scholarship awarded. On the other hand, the partial payback policy requires the payback amount to be proportional to the degree of under-performance. In a small scale survey, we find Murray State University, University of Colorado — Boulder, University of North Texas, State University of new York — Oswego, University of South Florida — Tampa, and Georgia State University all adopt full payback policies. All universities request for payback for academic under-performance except Georgia State University which applies to non-attendance only. College of Business at University of Texas — San Antonio experimented with partial payback policy in 2007. In this case, students were asked for payback for each failing class. We analyze the responses of students to

* Corresponding author. East Asia Institute, University of Texas at San Antonio, One UTSA Circle, San Antonio, TX 78249, United States. Tel.: +1 210 4587312.
E-mail address: don.lien@utsa.edu (D. Lien).

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these policies, specifically, how they choose optimal effort levels should they participate in the study abroad program and then how they decide to participate or not. Next we consider the problem faced by the university regarding the choices of the scholarship format and the target performance. We assume the university attempts to maximize the average post-program ability of its student population and evaluate the possibility of the scholarship to depend upon the pre-program ability (which is a policy currently adopted by most universities). Thereafter we determine the optimal target performance level.[1]

The remaining of the paper is organized as follows. In Section 2, we describe the framework for the full payback scheme and individual student decision on efforts and participation. Section 3 provides the optimal scholarship format and Section 4 the determination of the target performance level. Partial payback scheme is analyzed in Section 5. The following section illustrates the results with specific functional forms. Finally, Section 7 concludes the paper.

2. Full payback scheme

A student is endowed with an ability θ_1. Across the student population, the ability has a probability density function $g(.)$ over the interval $[\underline{\theta}, \overline{\theta}]$. Without loss of generality, we normalize the population size to be one. There is a study abroad program available for every student with a cost of c. The university provides a scholarship to each student participating in the program in the amount of $s(\theta_1)$ with $\mathrm{d}s/\mathrm{d}\theta_1 \geq 0$. After completing the study abroad program, his ability is improved to $\theta_2 = f(\theta_1, e)$, where e is his effort level. It is assumed that $\partial\theta_2/\partial\theta_1 > 0$, $\partial\theta_2/\partial e > 0$, $\partial^2\theta_2/\partial\theta_1^2 < 0$, $\partial^2\theta_2/\partial e^2 < 0$, and $\partial^2\theta_2/\partial\theta_1\partial e > 0$. Thus, a student with better initial ability before participating has better post-program ability. A student gains more from the program if he works harder. Both positive effects are decreasing as the initial ability increases or as the effort level improves. Finally, the initial ability and the effort are complementary to each other. A better student will gain more from additional effort than a corresponding less able student.

We consider a full payback policy such that a student will have to pay back the whole scholarship money if his post-program ability is less than a target level, $\overline{\theta}_2$.[2] Let $\overline{e}(\theta_1)$ be the solution to the equation: $f(\theta_1, \overline{e}(\theta_1)) = \overline{\theta}_2$. We assume a student who does not plan to work hard to meet the target ability will not apply for the scholarship. Thus, $\overline{e}(\theta_1)$ is the minimal effort a student with ability θ_1 must sustain should he choose to study abroad. It can be easily shown that $\overline{e}(\theta_1)$ is a decreasing function of θ_1. A less able student will have to work harder to maintain the minimum required post-program target ability. After studying abroad, the student will receive a wage income equivalent to his ability, θ_2. The disutility from efforts is denoted by $(1/2)ve^2$ in terms of monetary unit; where v converts disutility from efforts into monetary units. As a consequence, the student chooses the optimal effort level to maximize the following:

$$U(\theta_1, e) = \theta_2 - (1/2)ve^2 - c + s(\theta_1) = f(\theta_1, e) - (1/2)ve^2 - c + s(\theta_1), \tag{1}$$

subject to the constraint

$$e \geq \overline{e}(\theta_1). \tag{2}$$

Suppose that $e = k(\theta_1)$ is the solution to the following equation:

$$\partial f(\theta_1, e)/\partial e = ve. \tag{3}$$

Let $e^*(\theta_1)$ denote the optimal effort level. Then $e^*(\theta_1) = k(\theta_1)$ if $k(\theta_1) \geq \overline{e}(\theta_1)$; and $e^*(\theta_1) = \overline{e}(\theta_1)$, otherwise. Alternatively, using Kuhn–Tucker condition, we have

$$[e^*(\theta_1) - \overline{e}(\theta_1)]\left[\frac{\partial f(\theta_1, e^*(\theta_1))}{\partial e} - ve^*(\theta_1)\right] = 0. \tag{4}$$

$$\frac{\partial f(\theta_1, e^*(\theta_1))}{\partial e} - ve^*(\theta_1) \leq 0. \tag{5}$$

Intuitively, if the marginal benefit of additional effort, $\partial f(\theta_1, e)$, at the minimal level, $\overline{e}(\theta_1)$, is smaller than the marginal cost ve, then the student will exert the minimal effort. Otherwise, the student will expand his effort to the point where the marginal benefit equals to the marginal cost.

[1] Lien and Wang (2009) examine a similar issue within a different framework. In their paper, the production function of the study abroad program incurs an uncertainty. The optimal target level is determined under the assumption of a fixed amount of scholarship and a full payback policy. In the current paper, the optimal scholarship formula is determined endogenously whereas both full and partial payback policies are considered.

[2] We assume a constant target level for all students. Thus, it is easier for students with higher initial ability to meet the target. Suppose the university is more interested in ability improvement. Different target levels may be established for different students. This approach will encourage more low ability students to study abroad. In reality, to the knowledge of the authors, no university ever adopts this policy. It is also sub-optimal for a university which attempts to maximize average post-program student ability as a student with lower initial ability gains less from studying abroad. Mathematically, we can replace $\overline{\theta}_2$ with $(1+\delta)\theta_1$, $\delta > 0$, to proceed with a similar analysis. In this case, however, the cutoff ability for studying abroad, θ^* may not exist.