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Tuition discounting: theory and evidence

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Abstract

It is frequently assumed that rising enrollment improves an institution's financial condition. In fact, enrollment growth can have an adverse impact on the institution's financial condition, even in the presence of excess capacity. The reason for this surprising conclusion is that the size of the subsidy required to attract additional students may cause the net financial impact to be negative. In the past two decades, private institutions have been very aggressive in their competition for gifted students. Administrators and their governing boards should carefully review their tuition discounting policies, since conventional wisdom may be misleading. This paper contains a theoretical discussion of tuition discounting policies and it explores how the marginal benefit, net of the marginal cost of increased enrollment, varies across public/private institutions and across institutions with different missions. © 2002 Elsevier Science Ltd. All rights reserved.

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1. Introduction

Despite growing national enrollments, some higher education institutions experience difficulty filling their freshman class each year. Private institutions encounter this problem most frequently, although it is not unheard of among some public institutions. The resulting competition for gifted students has created what McPherson and Schapiro (1999) call a “free-for-all in financial aid”. Among liberal arts colleges, it is not unusual to find institutions whose average tuition discount¹ exceeds 40%.

Some anecdotal evidence² suggests that individual institutions discount their tuition in ways that seriously weaken their institutions.

In this paper, I consider the economics of tuition discounting. I explore the conditions under which aggressive tuition discounting weakens the institution's financial condition. The appropriate definition of capacity plays an important role in identifying the correct marginal cost and the complications created by price discrimination are considered in the identification of marginal revenue. These principles are applied in an empirical section where I estimate marginal revenue and marginal cost for different higher education sectors. The marginal impact of enrollment on colleges and universities is an empirical

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¹ Posted tuition and fees are “discounted” by the size of funded and unfunded scholarships that are awarded to individual students. If the average tuition discount rate exceeds 40% it means that the average student at that institution receives a scholarship that exceeds 40% of the institution's total tuition and fees.

² In a recent report in *The Chronicle of Higher Education*, Gose (1999) reported that reverse engineering of aid offers by MIT revealed that many of the offers are “just completely unfathomable”. The interested reader can find other articles in the *CHE* concerning financial difficulties at liberal arts colleges where excessive tuition discounting creates financial problems.

question. There are important structural differences between private and public institutions, particularly with regard to how they garner subsidies. There is little reason to believe that all types of institutions — public, private, research universities, and doctoral institutions — are equally impacted by fluctuations in enrollment. This information is useful for public policy and it is useful for administrators who struggle to formulate their institution's scholarship policies.

2. Capacity, scholarships, discounting, and quality

Conventional wisdom suggests that an increase in volume has positive financial implications for any given enterprise. Anyone familiar with introductory economics knows that this conclusion depends critically upon the relationship between marginal revenue and marginal cost. If the increase in volume comes from an increase in demand, it implies a higher marginal revenue and an improved financial position. If the increase in volume comes from an increase in quantity demanded, marginal revenue declines and it does not necessarily follow that the firm's financial position is improved. The relationship between volume and financial condition is rendered more complex by the economics of higher education.

There are important institutional differences between non-profit higher education and profit maximizing firms. One significant difference is that shutting down in the short run is not an option for higher education institutions, since reputations and overlapping cohorts make this impractical.³ Therefore, if average revenue is less than average variable cost in the short run, a higher education institution cannot temporarily shut down. If the problem is temporary, the institution must finance the accumulating deficits. This increases the financial burden of long run recovery and lowers the probability that the institution will ever achieve financial stability.

Another critical difference is that the representative higher education institution sells its services for a net price that is less than the average cost of providing that service in both the short run and in the long run (Lewis & Winston, 1997). The average student receives a substantial subsidy and the institution is always in deficit with respect to student-generated revenues and total expenditures. If the deficit is closed, it is closed by subsidies from third parties; such as the endowment, public funds, or individual contributions. Therefore, any permanent increase in enrollment must be accompanied

by an appeal to these third parties.⁴ The institution must match its enrollment with its capacity to subsidize the number of students it has enrolled. Other things being equal, this ensures that an increase in enrollment will cause financial problems for these institutions in the short run and in the long run.⁵

As it is with the profit maximizing firm, marginal revenue must exceed marginal cost in both the short run and the long run for an increase in enrollment to have a positive financial impact on the institution. However, the marginal cost appropriate for determining the net benefit from increased enrollment depends on — among other things — capacity utilization. Institutional capacity in higher education is more complicated than the traditional capacity concept.

2.1. Capacity

There are at least three different types of capacity in higher education: physical plant; instructional; and subsidy capacity. The marginal cost required to evaluate the impact of an increase in enrollment depends on the relationship between total enrollment and all three forms of capacity and on whether all three types of capacity are balanced in the institution. Physical plant capacity consists of housing, dining, classroom, office, and student service capacity. Instructional capacity depends on the institution's policy decisions with respect to instructional quality. When the institution sets an average class size, it pegs the student/faculty ratio and the number and size of the classrooms and faculty offices it requires to accommodate that policy. Hence, instructional capacity and physical plant capacity are directly connected by these policy decisions regarding quality. In addition, the number of students and the number of faculty will determine the support staff required and the size of the support staff also influences physical plant. Finally, the institution's cost, its endowment, and the type of student it intends to recruit determine the capacity to provide subsidy support. Subsidy capacity can be increased by lowering costs, raising more endowment, or lowering the quality of the students that the institution seeks to recruit.

⁴ The problem is analogous to airline deregulation. As was expected, the real cost of air travel fell significantly and the quantity of air travel demanded increased by a corresponding amount when airlines were deregulated. On the supply side, however, there were a group of critically important public inputs that are driven by political forces rather than by market forces. So, air traffic control systems and new airports have not expanded at the same pace as air travel.

⁵ The size of this problem for all of higher education is explored by Dionne and Kean of CAE/RAND (1998). A failure to provide the required subsidies will adversely effect the higher education participation rate and could have significant implications for future economic growth.

³ Trinity College of Vermont announced it would shut down and then attempted to reopen (Van Der Werf, 2000).

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