

ASSESSING THE EFFECTIVENESS OF LEARNING OPPORTUNITIES: IMPROVING COURSE AVAILABILITY THROUGH DEMAND BALANCING

Syed A. Rizvi

Professor and Former Associate Provost for Institutional Effectiveness
College of Staten Island/CUNY
New York, New York

Tanja E. Jacobsen

Vice President of Sales & Marketing, Buzzfile, Inc.
Adjunct Faculty, Assistant Professor
Hofstra University
Hempstead, New York

ABSTRACT

Four-year graduation rates have become a key performance measure for the institutions of higher education. However, with less than 30% of the first-time freshmen being able to graduate in four years from a four-year program suggests an investigation of the factors that affect a timely progress of students through their course of study. Many would argue that the poor college preparation of our high school students is to blame for low graduation rates at the institutions of higher education, a situation, which is really not in the control of these institutions. We propose that course availability can play a significant role in the timely progress of students through their course of study. This element is well under institutional control. Course availability can be affected by the pockets of varying demands of courses/classes, which exist naturally at most institutions due to scheduling constraints and the preferences of different segments of student body. Improving course availability would accelerate students' progress in their course of study, and therefore, would help improving graduation rates. In this research, we examine the course availability to students from an institutional effectiveness perspective. We propose to improve course availability through demand balancing in which the demand is strategically shifted from the high-demand segments to low-demand segments through financial incentives. Our model is based on cost minimization and, therefore, we do not propose imposing a tuition premium on high demand segments. Instead, we propose targeted outreach (marketing) with financial incentives to strategically shift demand from high demand to low demand segments. We also identify key segments of student body for highly target outreach (marketing) for maximizing the effectiveness of the proposed model.

INTRODUCTION

Would you conduct business with a company that can hardly deliver a product, and when it does, it delivers to only 20% of its customers on time? The answer to this question in all likelihood is going to be an resounding “no,” no matter whom you ask. As a matter of fact, that kind of business would not remain in business for long. Then, how can we let the institutions of higher education get away with graduating only 20% of any entering class in four years from a four-year program? This seemingly very legitimate question would be mind-boggling for politicians and public alike as the graduation rates are one of the key indicators that are being used by many to assess the performance of institutions of higher education. Despite the emphasis on improving the graduation rates, they continue to be relatively low at public institutions (Hartle, 2011; Linda DeAngelo, 2011). For example, data shows

that only 30% of the first-time freshmen are able to graduate in six years (six-year graduation rate) from a four-year program (Linda DeAngelo, 2011). That is, after spending 50% more time, still only 30% of an entering class was able to graduate. In the business world, this would be considered a rather poor performance. So why should we not hold the institutions of higher education accountable? Before we give the institutions of higher education a failing grade, let's take a closer look at the business of higher education. In reality, the institutions of higher education are not like ordinary businesses. Some may even argue that they should not be run like a business at all. Furthermore, the product (or service) sold by the institutions of higher education is also fairly complex.

The institutions of higher education provide a service in the form of learning opportunities or training, etc. A degree or diploma is an attestation of the level of achieve-

ment of learning or training needed in a particular area or discipline. The service provided by the institution of higher education is not to deliver a diploma in four years to the students who are signing up for a four-year program. Instead, the service provided by those institutions is the opportunity to learn and demonstrate the level of achievement in knowledge base and/or skill set needed to earn a diploma within the specific time, which is four years for a four-year diploma. An institution's obligation is to provide the opportunity and student's obligation is to learn and demonstrate his/her learning. So, the cause of failing to graduate students in four years from a four-year program can be attributed to two broad factors: (1) lack of opportunity to learn, which is solely the responsibility of the institution and (2) lack of learning, which is largely the responsibility of the students and, to some extent, shared by the institution. An institution can provide a perfect opportunity to a student to complete a four-year diploma within four years; however, if the student does not put the time and effort in acquiring knowledge and/or skill set needed for that diploma, s/he will not graduate in four years and the institution is not to be blamed for that. However, we must hold the institutions accountable if they fail to provide the opportunity.

So, what are the institutions of higher education? One common definition of an institution of higher education is that they are not-for-profit entities (true for all public and most private institutions) that provide opportunity for learning beyond secondary education with a four-year program leading to a bachelor's degree or, at least a two-year program resulting in a diploma fully applicable towards a four-year degree (20-USC-§-1001). The designation of the higher education institutions as "non-profit" for some means preclusion of business practices that an ordinary business would employ to sustain and thrive. However, institutions of higher education still have facilities to maintain, services to provide, and operations to run, all in support of its core function of providing opportunities for post-secondary education. Some people in academia may still consider the function of the institution of higher education a sacred mission of educating people for the greater good of the society that should not be contaminated by everyday business practices. However, the recipient of the services provided by the institution of higher education—students (as well as their parents) are more and more thinking and acting like a consumer with all the expectations that any consumer would have from a business (Mayes, 2002). Treating an institution of higher education like a business may still not sit well with many intellectuals in academia; however, the call for doing this goes back more than half a century (Fram, 1973; Krachenberg, 1972), where researcher have drawn parallels between business and higher education propos-

ing business-like marketing strategies and variable pricing for tuition.

How can the best practices from the business world help the institutions of higher education to improve their key indicators such as graduation and retention rates? There are many factors that may affect one's progress into an academic program and many of them are beyond the control of any institution of higher education including poor preparation for college, personal priorities etc. However, there are other factors such as advisement and availability of the appropriate courses to facilitate a timely progress of students through the program. Maximizing the availability of the courses can accelerate the progress of students through academic programs. However, maximizing the availability of courses may result in decreased average utilization of capacity in course sections if the institution is running the courses in prime-time slots to full capacity and would end up opening new course sections in relatively less popular time slots. That may result in additional cost, which many institutions, especially public, cannot afford as they are already struggling to survive financially due to a consistent decrease in public support for these institutions over the last decade. The only choice that these institutions have is to reduce the cost of its products or services and improve efficiencies. As a non-profit entity, it is understandable that an institution of higher education's business model unlike ordinary business, should not be based on profit maximization; however, there is nothing that prohibits these institutions from following best practices in the business world to reduce cost and become more efficient. Reduced cost and improved efficiency means more qualified advisors and more course availability for our students, which can help improve graduation and retention rates.

The rest of the paper is organized as follow: Section II briefly reviews the academic product and draws parallels between academic institutions and businesses closest to academic institutions in terms of selling their product and services. Section III describes the proposed model that strategically shifts demand from high demand segments to low demand segments, both at micro and macro levels. Finally, section IV concludes the paper by identifying various target audience(s) for implementing an effective demand shifting strategy.

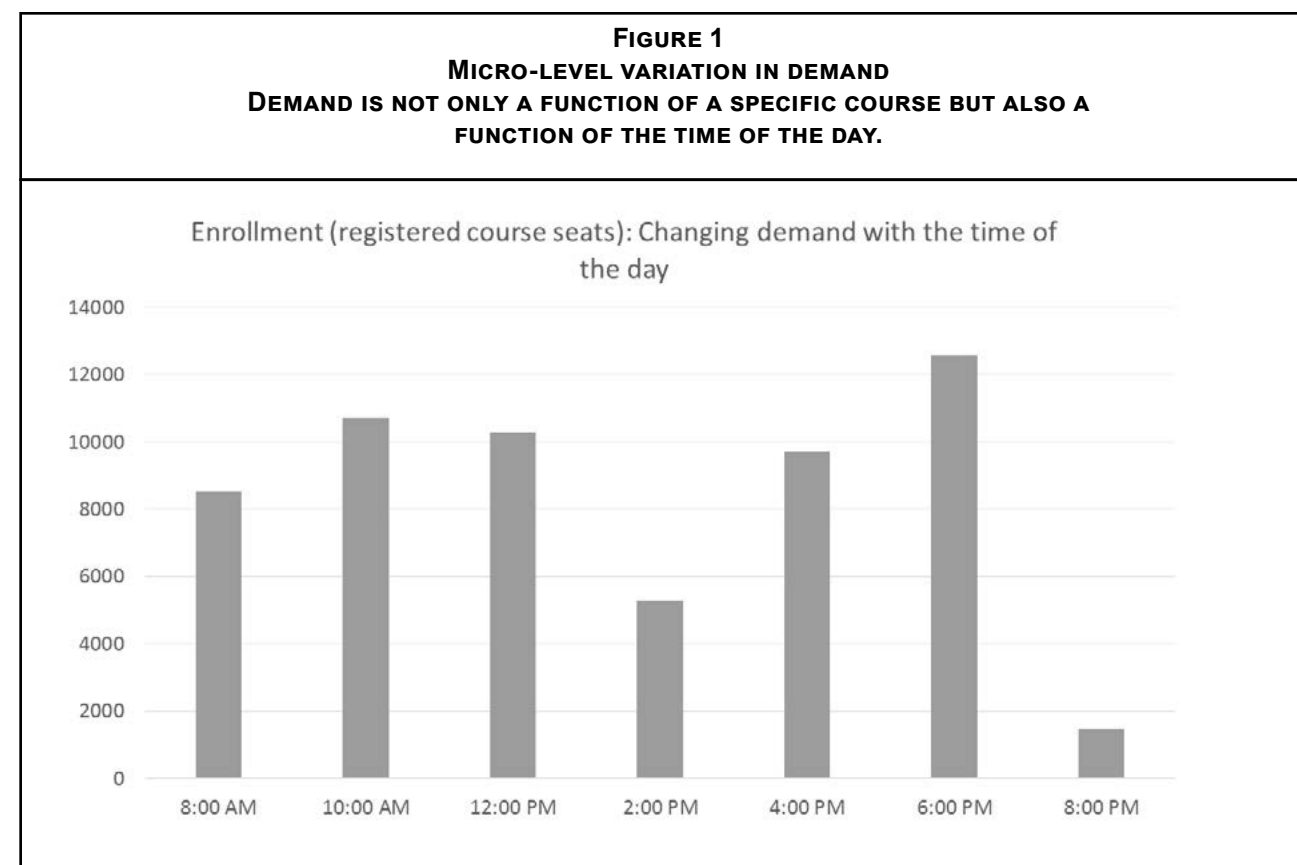
THE ACADEMIC PRODUCT

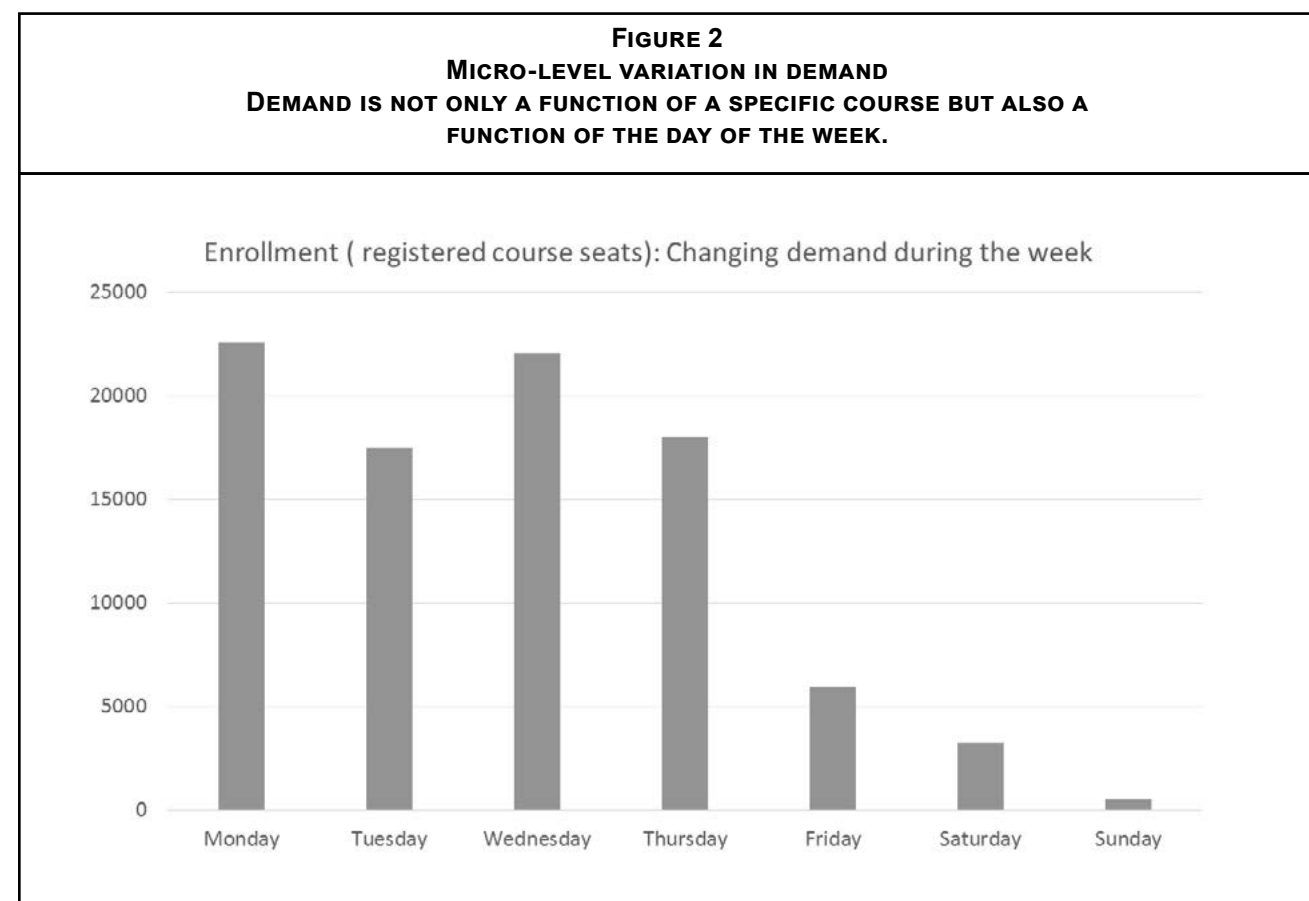
Before we can develop any framework or model for an academic institution, let's consider what exactly is being produced and sold by an academic institution. Simply put, the core product sold by the institutions of higher education is an academic credit, which is sold in unique groups of variable numbers of credits (in groups of one to four

credits at most institutions) through seats in different courses (generally referred to as a course or class). Each course is unique and its demand depends upon many factors. The primary factors affecting the demand of a course are related to the nature of the course such as whether it is a part of the general education component of the curricula or a program in a specific discipline (major); and in the case of a course in a major, which major etc. Among secondary factors affecting the demand of a course is time and/or the day when the course is offered. Other factors such as the course instructor, and the perception of the course (easy or hard) may affect the demand; however, different instructors may teach different sections of the same course in the same semester. Also, in different semesters, instructors can be different thus making impact on the demand short term and individualized. Therefore, we will ignore these factors in our analysis. On the other hand, the product is seldom produced as a single unit. An example of producing a single academic credit would be a one-credit independent study. Instead, it is produced in the form of a preset number of course seats through opening a course section. Each time academic product is produced, it has a specific period of time to be sold. Any unsold products beyond the specific period of time permanently lose their potential of producing any revenue and therefore,

are wasted. Clearly, producing and selling academic products (credits) is rather complex and, accordingly, any cost revenue analysis is not trivial. All public and most private institutions for higher education are not-for-profit entities and, therefore, their business model is not based on profit maximization. Instead, it is the cost minimization that can be used to improve the financial viability of these institutions.

The academic product also requires strategic selling for an effective utilization of course seat capacity, which is a challenge for every institution of higher education. Figure 1 shows what segmented demand may look like at micro level, where demand is changing with the time of the day. Figure 2 shows another view of changing demand at the micro level, where demand is changing with the day of the week. Pockets of varying demand of course seats exist both at the micro and macro levels. For example, courses that are offered from 8 AM to 10 AM time slots may not be of high interest to many students in a university in an urban area where this time slot represents a part of the morning rush hours and many people would not choose to commute during rush hour if they had a choice. So 8 AM to 10 AM time slots represent a lower demand segment at the micro level. The 10 AM to 2 PM time slots





may represent another micro level of moderate to high demand segment as many working people can take a class during their lunch break. However, the 6 PM to 8 PM weekdays time slots represent the highest demand, micro level segment as most working people can typically take courses after work. However, as most of those working individuals want to go home and wind down in preparation for the following working day, the demand in the 8 PM to 10 PM slots may see a sharp decline.

The challenge for academic administrators is to change those pockets of low demand into the pockets of opportunity for increasing course availability and improve capacity utilization. On the other hand, summer or winter sessions represent low demand segments at the Macro level. For an institution in an urban area where there is a significant number of students are working, 6 PM to 8 PM time slots become a bottle neck in their progress towards their degree and, eventually impact overall graduation rates. Other institutions may have different segments of varying demand at the micro and macro levels depending upon their own unique situation. As long as they have the segments of varying demand, they may find our model and

techniques useful in improving their capacity utilization (utilization efficiency).

Our proposed model attempts to shift the load from high demand to low demand or underutilized segments through dynamic pricing of tuition both at micro and macro levels. The dynamic pricing in our model does not impose any surcharge on tuition for registering in the peak demand segments, which was the case in previously failed attempts to introduce dynamic pricing in higher education. Instead, under our recommended model, everyone pays the same tuition regardless of the discipline or time and the day of the course. A key difference is, that it provides discounted pricing through rebates for registering the courses in specifically targeted segments such as summer or winter inter sessions, classes starting 8 AM or 8 PM or classes on Friday or weekends. The impact of this strategy is twofold: (1) It gives those people economic incentive to take additional courses who would not have done so otherwise because of financial reasons. The net result is increase in the average credit load of the students and possibly some additional revenue. (2) Anyone who would have taken courses in the peak demand segments in the absence of the economic incentives and takes the

courses in the discounted segments, would free up seats in the peak demand segments, which can then be used by other students who could not register elsewhere.

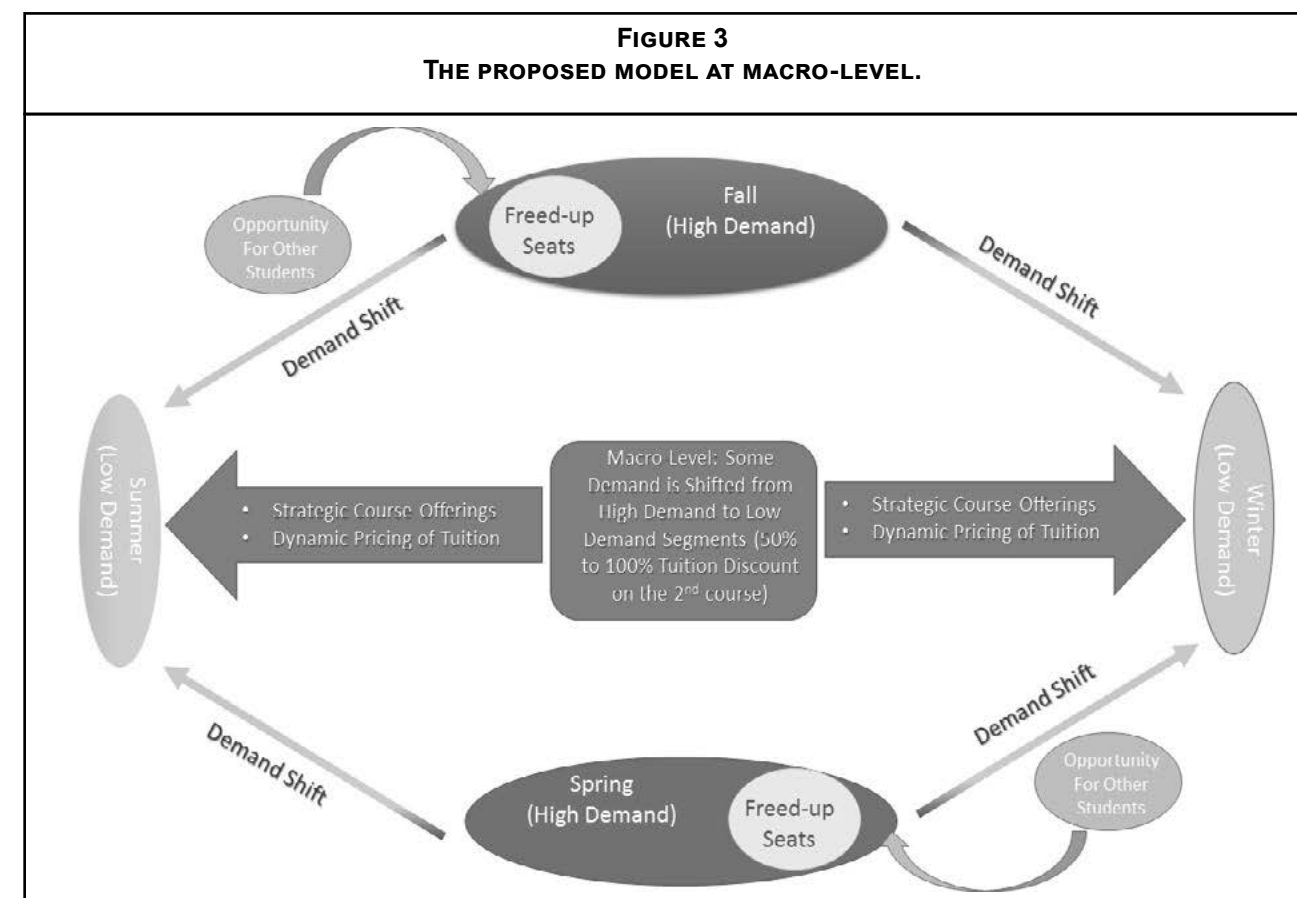
DEMAND BALANCING MODEL

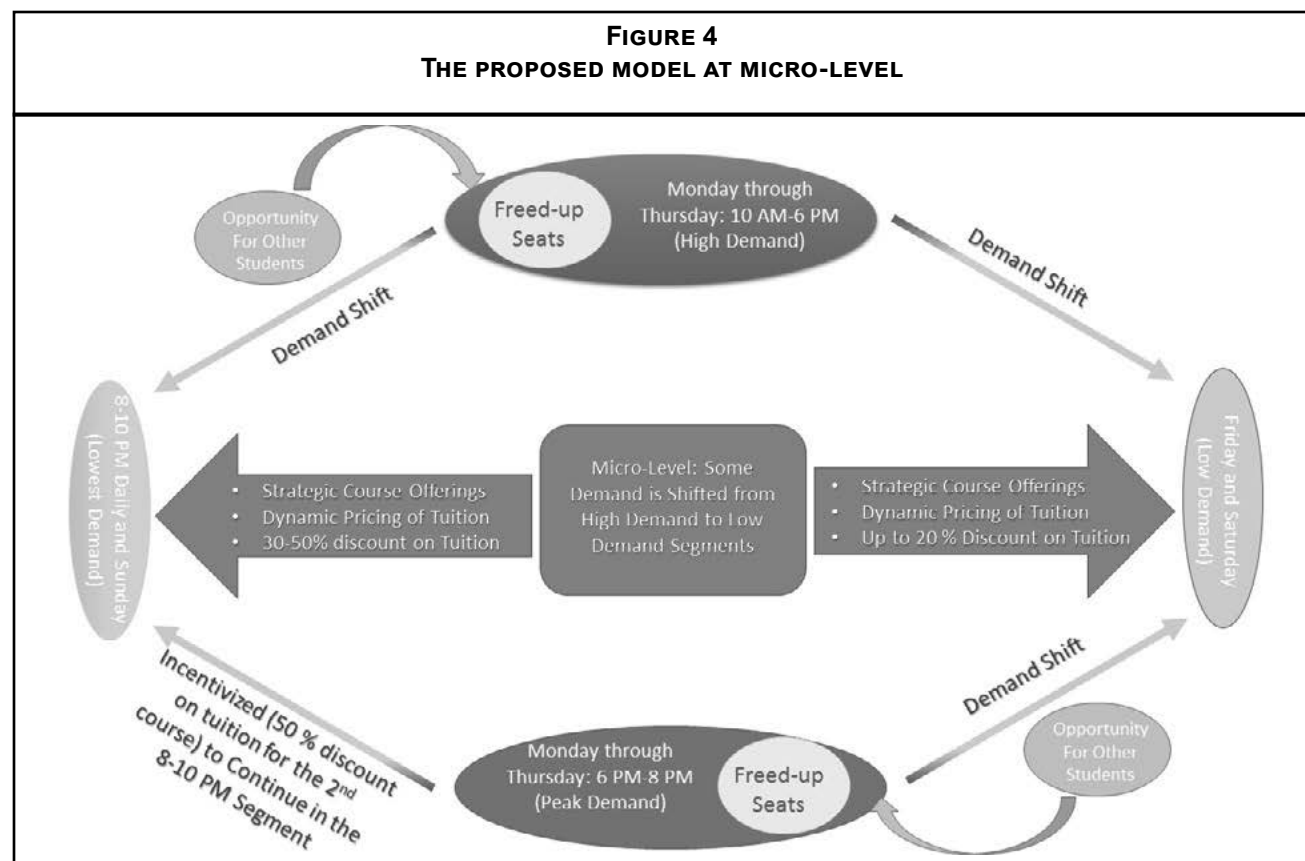
Our model focuses on increasing the course availability in a cost-effective manner through a combination of strategic course offerings and dynamic tuition pricing. Figures 3 and 4 outline the proposed model at the macro and micro level, respectively. As mentioned earlier, our objective is not to maximize profit but to increase course availability in a cost-effective way. Accordingly, our dynamic pricing is based on the segmented demand and does not differentiate between disciplines. However, increased course availability would bring the most social and economic benefits when implemented strategically targeting the right audience.

Academic product has the two key characteristics (McAfee & Velde, 2006), which make a product very suitable for dynamic pricing for profit maximization. The academic product is good for short windows of time. For example, any unfilled seats in a course are wasted forever

within couple of weeks after classes start. This is equivalent to having an expiration date on the product just like perishable items or hotel room or airline seats, etc. Also, the capacity is fixed well in advance (course offerings for upcoming semester, etc.) and adding capacity comes at a relatively high marginal cost. For example, adding another course means a substantial financial commitment at least initially when there are a very few or no students registered yet. Airline and hospitality industry among many, which have products with similar characteristics, have used dynamic pricing for profit maximization. Since our objective is not to maximize profits we propose to use the power of dynamic pricing to minimize the average cost of the academic product.

As mentioned earlier, the purpose of dynamic pricing is to give people incentives to take courses in low demand segments if they are able to take the courses in those segments but would not take them otherwise for whatever reason. Therefore, we propose most discounts for winter and summer sessions which represent the low demand segments at macro level. At most institutions, summer is not part of the academic year. Accordingly, most full-time faculty have their teaching assignments during the Fall





and Spring semesters only. However, the institutions are open year-round. The fixed cost to run the institution that occurs during summer (and winter inter-session, which is a three to four-week period between Fall and Spring semesters) session is largely the same as the cost during the regular academic year. However, most classroom and laboratories are empty and therefore, are not producing any revenue. With a little additional investment (cost) in staffing, the course provides an opportunity for generating additional revenue with pretty high rate-of-return on investment (ROI). Conversely, this also provides an opportunity to the institution to take advantage of a very low marginal cost of the summer session seats and offer heavily discounted tuition pricing. This would result in social benefits such as improving retention and graduation rates as course availability improves and some demand is shifted from the Fall and Spring semesters. For example, incentives such as a second course at the half tuition or even free may be warranted for summer and winter sessions.

Similarly, the low demand segments at the micro-level such as the courses scheduled for 8 PM to 10 PM segment or on Friday through Sunday can be incentivized through varying tuition discounts depending upon the segment's existing demand. For example, 10-20% discount can be offered if one takes a course on Friday and Saturday, which

are relatively low-demand segments and perhaps heavier discounts such as 30-50% discount of tuition for courses offered after 8 PM or on Sunday, which may represent the lowest demand segments at the micro level. The level of discount will depend on the institution and intended audience and each institution would need to experiment with different level of discounts to see what works best for that institution.

TARGET AUDIENCE

The best incentives would not produce desired results if they are not marketed to the right audience. What group(s) of people are the right audience for this purpose would depend on each institution's unique situation. However, there are some common traits. Understanding them would be helpful in strategically increasing the course availability as well as developing an effective marketing campaign. Students can be divided into the following broad groups:

Group I: The students in Group 1 have well defined academic goals with minimum constraints. These students would have taken courses in any segment without any incentive. This group would not cause any increase in full-time equivalent enrollment (FTE) as they maintain the

same level of course load with or without any incentive. Consequently, there will not be a net gain in the social benefits. However, any financial incentive used by the students in this group may result in a net decrease in the economic benefit to the institution. For example, a student who would have taken a specific course load without any incentive would cause a net decrease in revenue if s/he uses the incentives.

Group II: The students in Group II are the ones who would not have taken the courses in the low demand segments and are drawn to the courses in those segments largely because of the financial incentives. The students in this group are likely to cause a net increase in FTE even if they maintain their course load at the same level as they would have without any incentives. This group frees up seats in high demand segments, which can be taken by the students who are constrained to higher demand segment because of their unique situations. If that happens, it would cause a net increase in FTE as well as revenue. Therefore, the students in this group would generate a net gain in the social and economic benefits. For example, any seat freed up in the 6 PM to 8 PM segment, when taken by a student who is working full time and was previously unable to take a course in 6 PM to 8 PM segment, would cause a net increase in FTE as well as speed up the progress of that student through his/her program of study. This group certainly deserve some marketing dollars, which could result in substantial gains in social and economic benefits.

Group III: The students in Group III are very price conscious and are always looking for bargains. These students would be willing to increase their course load if they find a financial incentive is sufficiently attractive. The students in this group have the highest potential to cause a net increase, both in FTE and revenue. Consequently, any use of incentives by these students would result in a net increase in both the social and economic benefits. This group should be the main target of any marketing campaign.

Group IV: The students in Group IV are specific mostly to institutions in urban areas where many working people attend a college after work making the 6 PM to 8 PM time slot the highest demand segment. As the Figure 2 shows, the utilization in the 8 PM to 10 PM segment, which is the segment immediately after the highest demand segment of 6 PM to 8 PM, drops sharply. Based on the data from Figure 2, at least 85% of those who took a class in 6 PM to 8 PM segment did not stay for another course. It is important to note these students are already on-campus. If there is anything that can keep them there for another couple of hours to attend another class that will be another source of net increase in the social and economic

benefits. A significant financial incentive that can keep at least some of the students from 6 PM to 8 PM segment to stay for another class may very well be warranted.

Preliminary research into the Demand Balancing Model shows potential for both social and economic benefits including reduced costs, increased FTE and graduation rates. Our on-going research will focus on quantifying social and economic benefits. We will investigate the possibility of including a marginal cost analysis in the proposed model that can optimize course availability for a desired balance between social and economic benefits.

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