# How Much are Your Students Willing to Pay?
# Testing Institutional Price Sensitivity

*Optimizing Price Strategies to Meet Student Enrollment & Revenue Goals*

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## Introduction

What should the price of education be at your institution?

Although the question may sound simple, college presidents, enrollment officials, and other administrators know all too well the difficulty in answering it. The challenge lies in the connection of this question to many others, such as:

- How price sensitive is our particular market?
- How can we raise revenue and still meet student enrollment goals?
- How will price increases affect our discount rate?
- How does our price affect our college's image in the marketplace?

In this paper we explore institutional price sensitivity; that is, how institutional researchers can gauge how much students and their families are willing to pay to attend a particular college or university. The price strategies discussed are based on a combination of market research and financial aid modeling techniques, and include both primary and secondary research techniques. More specifically, methods for gauging price expectations, price sensitivity, willingness to pay, and perceived educational value in the marketplace are discussed. In addition, techniques for modeling the relationship between individual-level financial aid expenditures and enrollment and financial goals are highlighted.

Our goal is to show how a more comprehensive approach to pricing can help colleges and universities address the multi-faceted nature of this topic and achieve a variety of desired outcomes, such as increased net revenue, greater overall student enrollment, higher enrollment among target student populations (e.g., higher ability students, minorities, students outside a school's primary geographic market) and enhanced image perceptions in the marketplace.

## The Context of Pricing Issues in Higher Education

This topic of price sensitivity is particularly relevant in light of the variable pricing structure ("top-up fees") that went into effect in the UK during 2006-2007. As a result of the 2004 Higher Education Act, tuition fees were deregulated and universities could charge anything from £0 to £3000. All but four universities decided to charge the full £3000 (none charged £0), which essentially rendered the "variable pricing" into a flat-rate structure. Even with the uptick in tuition fees across the board, many university administrators felt that this was not enough to cover their costs. Recent research suggests that the £3000 maximum cap for tuition fees in the U.K. will have to at least double by 2011 to make up the difference between the cost of providing education and the net revenue institutions receive (Meikle, 2007).

As a result, there is a very real chance that the British government may lift the cap of £3000 by 2011. In turn, this would change the well-intentioned, albeit unintended flat-rate structure that is currently in place. Looking ahead three years, how can university administrators prepare to set the appropriate price for their institution within its market to attract students and at the same time maximize revenue?

College administrators in the U.S. have been grappling with variable pricing structures for years, and understand the urgency associated with addressing these issues. Pricing decisions for most U.S. institutions need to be made on an annual basis, and they are coming under intense scrutiny from prospective students, parents, and federal legislators as educational costs soar and national economic conditions in the U.S. decline. When setting prices, many colleges and universities rely too heavily on intuition or what their competitors are charging, or simply make pricing decisions less effectively than they could otherwise. Many make their price decisions with limited knowledge about the price sensitivity of their own marketplace.

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It's a delicate balance. If the cost of attendance is set higher than the market is willing (or able) to bear relative to the perceived value of the institution, the institution will lose enrollment and revenue, because there will be fewer students in seats paying the higher price. If the cost of attendance is set too low, the institution may have healthy enrollment but be sacrificing prestige and much needed revenue. In fact, tuition increase decisions, enrollments, and financial aid policies are intertwined.

On one hand, university administrators are under pressure to cover their annual operating expenses and keep their institution strong and viable. On the other hand, students and families are confronted with tuition prices that each year rise well beyond that rate of inflation, and result in more out-of-pocket costs to them. The net cost of attending a particular college or university increasingly influence the two extremely important junctures in the decision-making process for families– at the beginning of the college search when families consider an institution's sticker price and at the end of the process when they look at net price as they make their decision on where to enroll.

## Primary Research Techniques

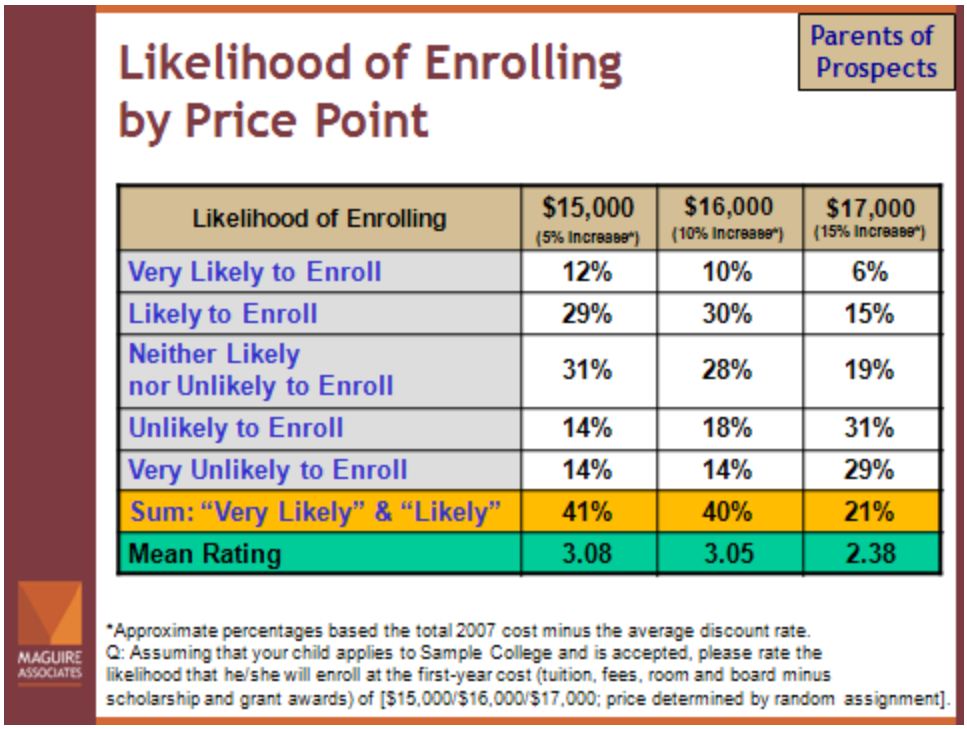
Fortunately, however, there are a variety of research techniques available to administrators who want to base pricing decisions on reliable market data. Broadly speaking, these techniques fall into two categories: primary (i.e., information collected from interactions with people, such as interviews or surveys) and secondary (i.e., information collected from non-human sources, such as existing databases or literature). In terms of primary research techniques, two sets of indices are most relevant: measures of price sensitivity and measures of perceived value. Despite their similar aims, different types of price and value measures offer unique combinations of benefits and limitations. To gain a better understanding of the conditions in which particular measurement tools are most useful, we will now discuss some of the main types in each category that are relevant to higher education.

Primary Research Measures of Price Sensitivity

*Monadic Testing*: This technique involves exposing each research participant to one price and gauging his/her reaction to it in the context of a quantitative survey. By randomly dividing the participant sample into two or more sub-groups, different candidate prices can be tested experimentally (i.e., testing in which only the factor of interest is varied across participants). From a research methodology perspective, this technique may be the strongest because it is less subject to many of the response biases associated with methods in which participants respond to more than one price. The main caveat of monadic testing is the need for robust sample sizes. For every price tested, sufficient sample is needed to conduct reliable statistical analyses. Depending on the number of prices tested, this may require substantially larger samples than would be necessary otherwise.

As shown in **Figure 1**, monadic testing is quite useful in gauging likely market reactions to potential price increases. In this example, we show the impact of three candidate prices on likelihood of enrollment among parents of prospective students (i.e., the financial decision makers typically in terms of college choice in the United States) at a fictional college. More specifically, we see that likelihood of enrollment is similar for the two lowest candidate prices, but drops sharply for the highest candidate price. Considering that each respondent reacted to only one price, we can reasonably infer that the differences in the average responses between groups are due to the prices and not other factors. As a result, a college for which these findings were obtained appears able to raise its price by least 10% (instead of 5%) without negatively impacting enrollment; a 15% increase, however, would likely dampen enrollment. Such results can also be analyzed by focal market segments (e.g., parents of students in particular regions, income level, etc.).

**Figure 1**



## Likelihood of Enrolling by Price Point

Parents of Prospects

| Likelihood of Enrolling | $15,000 (5% Increase*) | $16,000 (10% Increase*) | $17,000 (15% Increase*) |
|---|---|---|---|
| Very Likely to Enroll | 12% | 10% | 6% |
| Likely to Enroll | 29% | 30% | 15% |
| Neither Likely nor Unlikely to Enroll | 31% | 28% | 19% |
| Unlikely to Enroll | 14% | 18% | 31% |
| Very Unlikely to Enroll | 14% | 14% | 29% |
| Sum: "Very Likely" & "Likely" | 41% | 40% | 21% |
| Mean Rating | 3.08 | 3.05 | 2.38 |

*Approximate percentages based the total 2007 cost minus the average discount rate.
Q: Assuming that your child applies to Sample College and is accepted, please rate the likelihood that he/she will enroll at the first-year cost (tuition, fees, room and board minus scholarship and grant awards) of [$15,000/$16,000/$17,000; price determined by random assignment].

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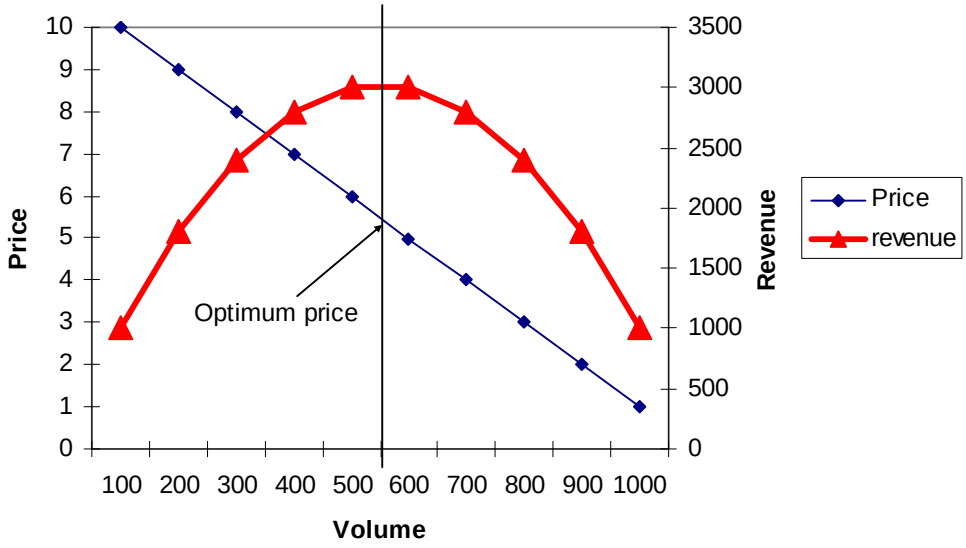
*Gabor-Granger*: In this method, respondents are asked whether they would buy a product at a particular price. Then the price is changed and they are asked again whether they would buy the product. The order in which the focal prices are presented is randomized across participants. Data from these measures can be used to calculate demand levels (i.e., the percent who would buy) for the product at each of the different price levels tested (and interpolated for prices in between). Given demand and price estimates, projected revenue can also be estimated to determine the optimal price (see **Figure 2**).

**Figure 2**



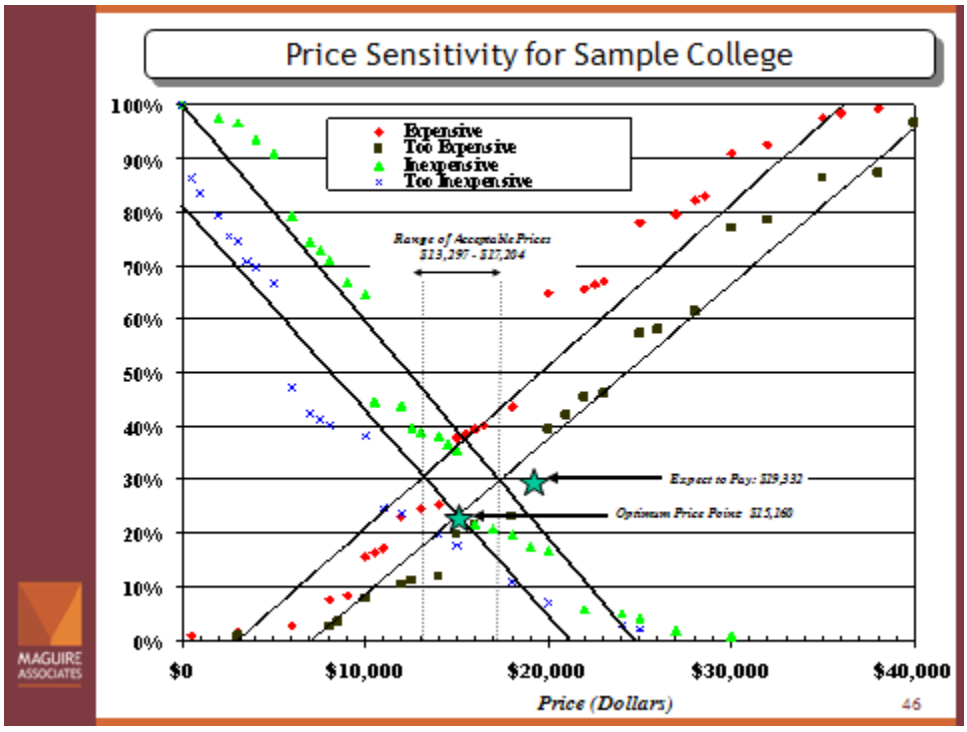

Some drawbacks of this technique include: a.) the large number of questions that are sometimes needed to generate the full price elasticity curve; b.) the chance that individual-level responses can be biased by responses to prices in prior questions; and c.) the possibility that respondents may underestimate the price they are willing to pay given that their responses are made in a isolated buying context (i.e., without explicit consideration other options). An alternative method that addresses some of these limitations involves asking a prospective parent or student whether they would enroll at a series of prices. The prices displayed decrease in magnitude until either the respondent indicates they would enroll or the minimum threshold that an institution would consider charging is reached. If one changes the question wording to address impact on enrollment decision, this question battery can also be applied to admitted non-enrolling students to gauge the degree to which such individuals may have been swayed by a better price from schools whose matriculation offers they turned down.

*Van Westendorp Price Sensitivity Meter*: This technique is based on a series of questions in which respondents are asked in an open-ended fashion to list the price they expect to pay, the prices they consider expensive and unaffordable, and the prices they consider inexpensive and so low that they would question quality and lose interest in what is offered. Applied to the realm of higher education, these questions can take the following forms:

- What is your best estimate of the amount of money you would expect to pay (regardless of how you finance it) for one year at Sample College? This price should include what you expect to pay in tuition, fees, and room and board minus any scholarship or grant awards your son or daughter may receive.
- Please estimate at what point the cost (tuition, fees, room and board minus scholarship and grant awards) per year at Sample College would become expensive.
- At what point would the cost (tuition, fees, room and board minus scholarship and grant awards) per year at Sample College become inexpensive?
- At what point would the cost (tuition, fees, room and board minus scholarship and grant awards) per year become so expensive that you would not be able to afford to send your child to Sample College?
- At what point would the cost (tuition, fees, and room and board minus scholarship and grant awards) per year be so inexpensive that you would question the quality of education at Sample College and not enroll there?

As shown in **Figure 3**, responses to these measures can be plotted (according to measures of best fit) to determine an acceptable price range for an institution's market (i.e., using the "expensive/too inexpensive" and "inexpensive/too expensive" intersections) and an optimal price point (i.e., at the intersection of the "too expensive" and "too inexpensive" plot lines.

**Figure 3**



Open-ended price measurement is probably the most distinctive feature of this method and it leads to both some benefits and some concerns in terms of data interpretation. On the positive side, asking respondents to record their unfiltered thoughts about prices has the advantage of avoiding bias that can be caused by supplying prices for assessment. On the downside, however, some respondents may have difficulty determining reasonably precise and correct answers to these questions (e.g., because they may not be able to think of clear bases for listing one price as opposed to other similar prices). As a result, some data cleaning (e.g., to remove/alter illogical answers) and/or normalization (e.g., to reduce the biasing impact of outliers) may be necessary to generate accurate and meaningful results with these method.

*Conjoint Analysis*: Conjoint analysis is a research technique used to gauge the value that people place on different features that compose an offering. Applied to the world of higher education, a conjoint analysis can be especially useful when gauging price sensitivity in the context of other key enrollment decision factors. For example, if an institution is considering more than one price, and variations along other dimensions (e.g., course scheduling: day only vs. day and night; meal plan type: standard vs. deluxe, etc.), conjoint analysis may be relevant. Depending on the exact nature of the design, conjoint analysis can take a variety of forms. In general, however, respondents are shown various combinations of the candidate options and asked to rate their preferences. Although the number of combinations can lead to respondent fatigue if several factors are varied (or a few factors are varied at several levels), this technique can be used to determine both the importance of price in enrollment decisions relative to the other dimensions and the optimal (i.e., most preferred) combinations of particular prices and features.

<u>Primary Research Measures of Perceived Value</u>

*"Value" in the Context of Higher Education*: Although price expectations play an important role in price sensitivity, so too do perceptions of educational value. In the United States, for example, the need to convey the relative "value" of attending one college over another has increased tremendously in recent years as the cost of tuition has soared (i.e., to the point where yearly tuition now frequently exceeds yearly family income). Students and families are often willing to pay more to attend a college or university that they perceive to be more prestigious or higher in quality. As a result, American colleges and universities – especially private ones – devote substantial resources to building an argument that justifies the cost of attending their institution over others.

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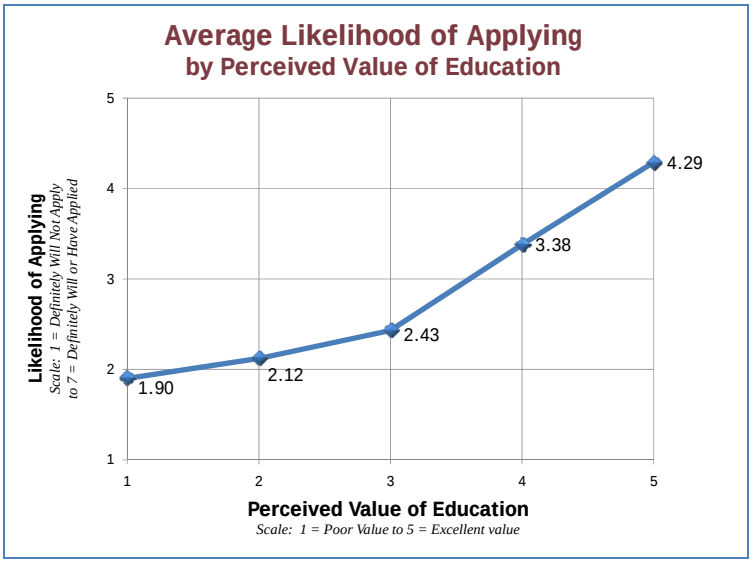
So, what is "value" within the context of higher education? For the purposes of this discussion, value is defined as the relationship between a student's/parent's expectations and perceptions of a college or university and the amount they are willing to pay for an education at that institution. To be considered a "good value," a college or university must meet the needs and expectations of students and their families at a cost that is reasonable and justifiable. Our research with prospective students has shown a strong positive relationship between perceptions of value and likelihood of applying and enrolling at a particular institution. As illustrated in **Figure 4**, average likelihood of applying to a particular institution rises as students' perception of its value rises from '1' (Poor value) to '5' (Excellent Value).

**Figure 4**



*The Cost/Quality Relationship*: *Value = (Net) Cost + Quality*

Any assessment of value of higher education must consider two core components: cost and quality. As a result, we typically measure overall perceptions of an institution's value by explicitly asking respondents to rate a focal school on this dimension while considering both the cost of the school and its quality (see **Figure 5**). It is notable that the value equation above includes "cost" and not "price." *Price* is generally more institution-centric, while cost is more student-centric. The price is the listed total expenditure of attending an institution which includes tuition, room and board, and other fees. While total price may steer some students away from private institutions, we find in our research with prospective families in the United States that the majority of students expect to receive some form of financial assistance from the institutions to which they apply, and as a result, often do not see the listed price as a deterrent to applying to a college or university.

## Figure 5

Listed below are a number of dimensions that students may consider when evaluating their experiences at a college. Please rate the quality of Sample College on each of the following.

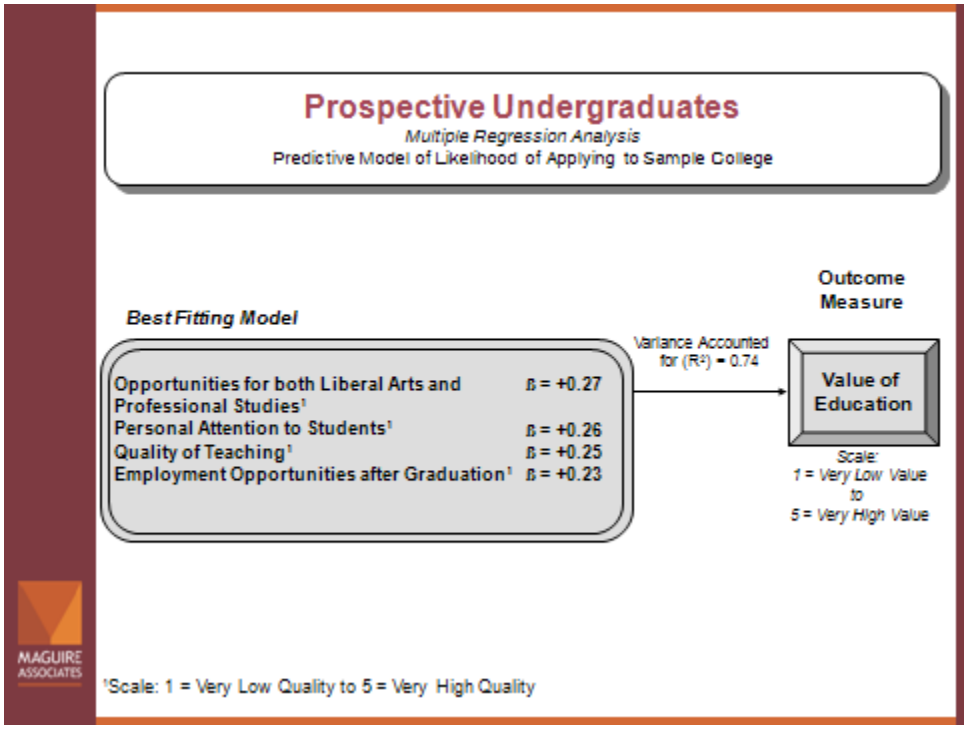
*Scale: 1 = Very Low Quality to 5 = Very High Quality*

| | n | mean | std. dev. |
|---|---|---|---|
| Quality of Faculty | **372** | **4.83** | **0.43** |
| Value of Education (combination of quality & cost) | **377** | **4.60** | **0.67** |
| Quality of Students | **377** | **4.49** | **0.68** |
| Close Contact with Faculty | **378** | **4.47** | **0.73** |
| Challenging Academics | **377** | **4.39** | **0.74** |
| Availability of a Specific Major/Academic Program | **377** | **4.36** | **0.83** |
| Small Class Sizes | **377** | **4.35** | **0.90** |
| Quality of Academic Facilities (library, classrooms, etc.) | **377** | **4.27** | **0.80** |
| Employment Opportunities After Graduation | **378** | **4.20** | **0.97** |
| Availability of Financial Aid to Meet Need | **376** | **4.18** | **1.19** |
| Academic Reputation of the College | **377** | **3.46** | **1.06** |
| Sense of Campus Community | **376** | **3.44** | **1.20** |
| Quality of Recreational Facilities | **377** | **3.25** | **1.21** |
| Opportunities for Public Service and/or Community Activism | **378** | **3.16** | **1.18** |

Instead, students and families tend to focus on *net cost* – the cost of an institution after financial assistance from all sources has been determined – in their college selection process and considerations of the value of education at an institution. In addition, other costs such as distance from home and/or the makeup of the overall financial aid package (particularly in terms of the amount of grant awards relative to loans, work study, and self-help awards) are important considerations in students' final college decision. The net cost of an institution is not known until a student is admitted and often varies widely from student to student. What is "just about right" for one student is "over priced" for another, and vice versa. In other words, each student will have his or her own optimal net cost for attending an institution – that is the net cost that will make him or her most likely to enroll. This price sensitivity often offers institutions opportunities in the form of financial aid leveraging. More specifically, the more price sensitive a prospective student body is, the more an institution may be able to use institutionally-funded aid strategically to encourage and support enrollment and to shape incoming classes.

While it is important to gain a better understanding of the strength of an institution's position in the market place at its current sticker price, it is also critical to understand whether an institution's value is associated more with cost or with other assessments of its quality and fit to students' needs. To gauge this, multivariate and predictive modeling techniques (e.g., regression, factor analysis) can be used to identify the features and priorities that are most closely aligned with willingness to pay for an education at a particular institution. As shown in **Figure 6**, sometimes these features are not driven by cost, indicating that students are willing to pay more for a school because they believe it offers more than other comparably priced schools on dimensions important to them.

**Figure 6**



Assessment of price sensitivity and perceptions of value requires careful study of not only the psyche of prospective students and families, but also of an institution's competition set. Perceptions of an institution's value vary in relation to different sets of competitors (e.g., publics vs. privates, liberal arts colleges vs. comprehensive universities). Thus, it is also important to learn how prospective students view an institution in the context of its competitors – for example, how it ranks on costs and overall academic quality.

## Secondary Research Techniques

Modeling for Price Sensitivity

In addition to conducting primary with key constituent groups to assess the value of your institution, researchers can also use data in-house model their institution's price sensitivity.

The development of a predictive model is a critical step in the process of price-setting. Logistic regression is most often the statistical tool of choice, because the enrollment probability function uses a dichotomous dependent variable (*i.e.*, the student did or did not enroll). Logistic regression is a predictive modeling technique (similar to multiple regression) that allows researchers to take student characteristics (such as scholarship amount, exam scores, sex, and need), and use them to predict the probability that an accepted student will matriculate to a given institution.

Key to the success of a predictive model is good quality data. Institutions that are considering developing a model to gauge their institution's price sensitivity should begin to collect and archive admission and institutionally-funded aid (scholarships, bursary, grants) data immediately, because the nature of the predictive modeling process is to look to the past to develop a model to manage to the present and envision the future. If no data are available from the most recent years, then the predictive modeling process cannot be undertaken.

Basic Admission Data

- Student ID number
- Student address information (city, state, zip, country)
- Student sex
- Student ethnicity
- Enrollment term
- Enrollment year
- Enrollment type (regular, transfer, etc.)
- Full-time, part-time status
- Commuter/Resident status
- International status
- Academic interest/major
- Exam scores
- High school grades or marks
- Faculty/staff child status (if tuition waivers are granted)
- Admit status (regular, special, etc.)

- Admitted (yes or no)
- Enrollment status (matriculant vs. non-matriculant)

Basic Institutional Aid Data

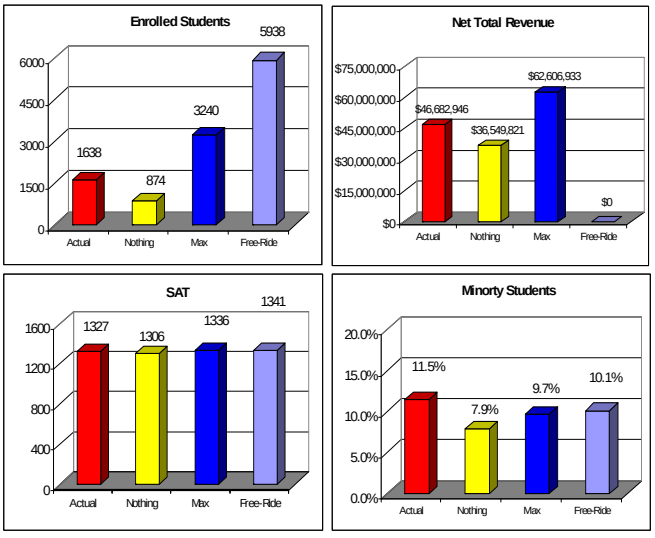
- Cost of attendance (tuition, required fees, room & board)
- Total institutionally-funded aid offered per student (scholarships, bursaries, grants)
- Financial need of the student
- FAFSA filer/non-filer

The result of the logistic modeling process will be an equation that identifies the various predictors of enrollment for students at your institution (each institution will have different predictors and different weights for each predictor). Once the predictors of enrollment are determined, you can conduct thought-experiment with your data. Your predictive equation can be augmented to test your market draw by assuming two theoretical extremes – that your institution will provide *zero institutional aid* to admitted students at one end of the spectrum (in other words, all student pay the full price of attendance) and *full institutional grant aid* to all students at the other (in other words, no cost of attendance). You can see how both extremes will affect your overall enrollment, student quality, and net revenue. The resulting ratio in enrollments will quantify your price sensitivity in your current market.
For the sample public college in **Figure 7**, there is a significant difference between the enrollment outcome at the zero price level where full aid is offered to all admitted students (Free Ride=5,938) and the full price level where no aid is offered to any admitted students (Nothing=874). This price sensitivity of 7 to 1 suggests a student population that will react to price quickly and dramatically.

If the ratio between zero price and full price were lower and the projected enrollments were not significantly different from each other, the conclusion would be that the market will not respond as rapidly to price increases – or financial aid offers. With the insights gained from this type of examination of data, researchers can better anticipate (and control) your enrollment goals and institutional aid budget. More importantly, researchers can gauge how price-sensitive their students are, and use that information to inform decisions about top-line price and the amount of institutional discounting that has to occur to achieve enrollment goals.

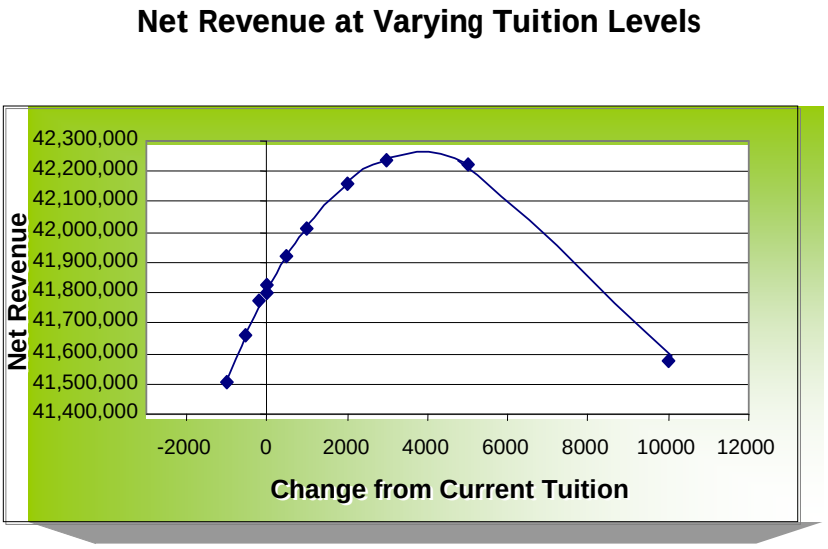
**Figure 7**

Sample College
Price Boundaries



After the thought experiment has been completed, analysis can be conducted to model possible price increases for the institution in the coming year. The results can give institutional leadership solid data for informing pricing decisions, because they will be able to see the consequences of each course of action.

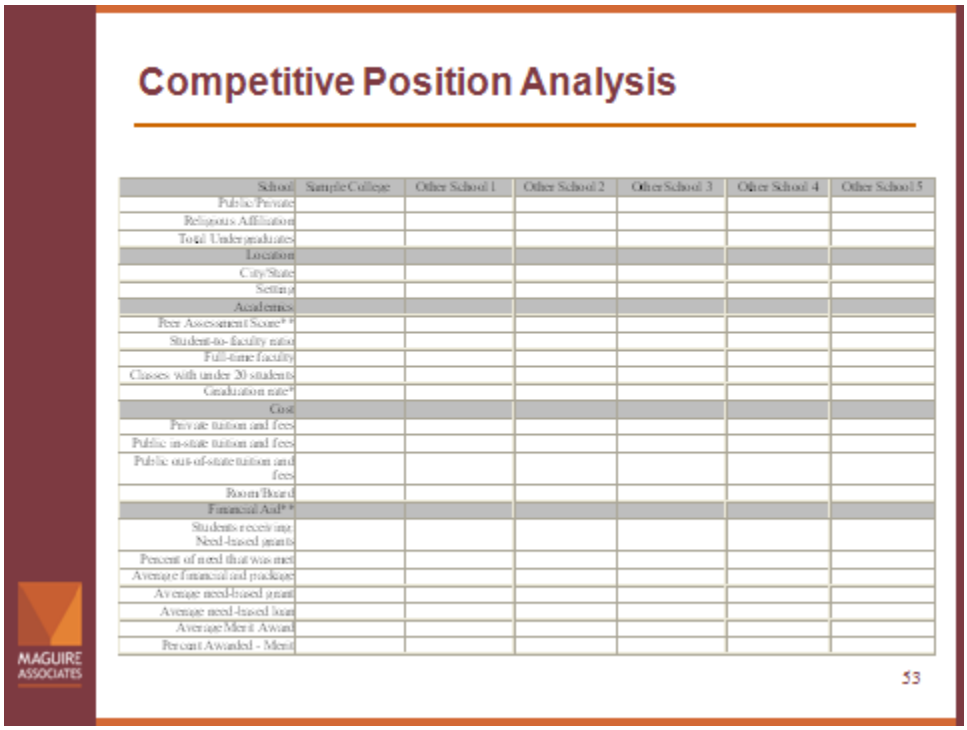
In **Figure 8**, the impact of different price increases upon net revenue at a major university are displayed. This institution was able to discern that it was not near its price ceiling in its current market. An experiment being considered, to lower its tuition, was determined to be unwise because additional net revenue would not be generated by enrollment increases.



Archival Research

Aside from in-house data, it is useful to analyze competitive benchmark information related to pricing from extant databases. For example, in the United States, resources such *US News and World Report* and the federal government's *Integrated Post-Secondary Education Database* (IPEDS) enable institutions to compare their vital statistics related to cost of tuition, discount rate, percent of students receiving financial aid and a host of variables against relevant figures from key competitors and "aspirant" institutions. As shown in **Figure 9**, charting this information can be an efficient way to show administrators, board of trustee members, and others charged with institutional pricing decisions where the institution stands in these respects in its competitive landscape.

**Figure 9**




## Conclusion

As illustrated in this paper, issues related to pricing are multifaceted and quite complex. Fortunately, however, there are a host of primary and secondary research techniques available to help base decisions related to pricing on data - both from the individuals who will be attending and paying a school's tuition and fees and from the focal institution and its key competitors. Using this data to inform pricing decisions will inevitably lead to more effective and strategic practices in this domain on the part of institutional administrators.

## Author Bios

**Sarah Parrott** is an expert in financial aid modeling and enrollment management research. Prior to joining the enrollment management modeling and consulting team at Maguire Associates, Sarah held the positions of Director of Research & Planning and Director of Enrollment Services at Brandeis University. She has extensive experience with institutional research and has worked closely with Alexander (Sandy) Astin at UCLA's Higher Education Research Institute. At Maguire Associates, Sarah serves as a consultant and analyst on the modeling team and contributes to the company's research and development activities. Sarah holds two bachelor's degrees (music and psychology) and a master's degree in experimental psychology from California State University, Northridge; a master's degree in education from UCLA; and a Ph.D. in higher education from UCLA. At Maguire Associates, Sarah has contributed to consulting and modeling projects for Pace University, the University of Oklahoma, Malone College, Northeastern University, Emerson College, Lasell College, and Saint Xavier University.

**Robert Mirabile** is an expert in research design and statistics. He enjoys probing deeply into data sets to uncover impactful and non-obvious findings, and he knows how to employ an optimal blend of quantitative and qualitative methodologies to achieve client goals. Prior to joining Maguire Associates, Rob served as a consultant for Marketing and Planning Systems, Inc., where he conducted a variety of market research projects, including both telephone and Web-based consumer surveys. Rob earned his bachelor's degree from Bates College and his master's and doctoral degrees in social psychology from Princeton University, where he studied attitudes and persuasion and published related research. Since his arrival at Maguire Associates, Rob has worked on projects for Assumption College, Colby College, Millikin University, the College of Mount St. Joseph, Dean College, Loyola College, Simmons College, Hood College, Beaver Country Day School, *The Chronicle of Higher Education*, and a consortium of independent middle schools in greater Boston.

**Tara Scholder** leads Maguire Associates' research team and has 12 years experience providing research and consulting to educational institutions to help advance and inform the development of institutional marketing, branding, and competitive positioning strategies, enrollment management practices, and strategic planning. Tara has a thorough knowledge of qualitative and quantitative research methodologies with all higher education populations, is well versed in advanced statistical techniques, and is an expert at providing meaningful summaries and insights from data. Prior to joining Maguire Associates, Tara worked as a Research Project Manager for four years for The Marketing Workshop, a full-service marketing research and strategy firm located in the Atlanta area. She has a M.B.A. with a concentration in marketing from Boston University and a bachelor's degree from Bard College. Most recently, Tara has worked on projects for Harvard University, Wentworth Institute of Technology, Rhode Island School of Design, Lexington Christian Academy, Boston University, Gordon College, Boston University, the University of San Francisco, Phillips Exeter Academy, the University of Puget Sound, and the University System of Georgia GA Prism Public Awareness Initiative.

## About Maguire Associates

Founded in 1983, Maguire Associates is a research-based consulting firm exclusively serving educational clients in the United States and abroad. For over two decades, Maguire Associates has applied innovations in market research, analysis, and predictive modeling to help our clients understand the dynamics of past performance, apply insightful knowledge to sound decision making and goal setting in the present, and attain intended outcomes.

Maguire Associates has served more than 400 client institutions in the US and abroad, from independent and public schools, colleges, and universities, to consortia and government organizations focused on education. We have a strong track record of supporting efforts across an institution – from strengthening the admissions process and helping deliver more robust, balanced incoming classes; to strategic pricing and ensuring the most effective use of financial resources; to image/brand development, target marketing, and competitive positioning; to improving student retention; to marshalling the talents of faculty and staff; to engaging alumni in all facets of institutional life.

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