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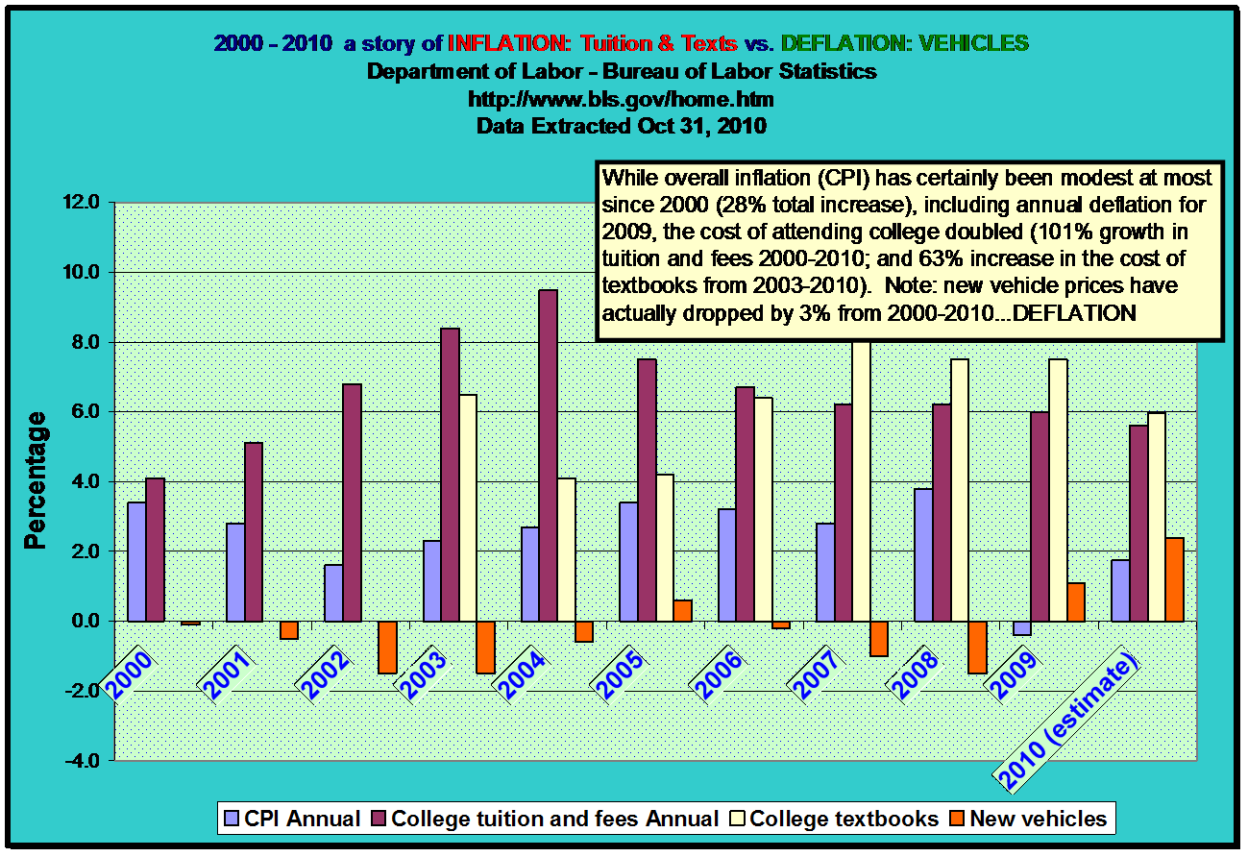
THE PRICE OF A COLLEGE EDUCATION:

A TROUBLED PRICING ENVIRONMENT IN ACADEMIA

The pricing of a product to buyers is as much of a science as it is an art. The former Big Three of the U.S. automotive industry, at least GM and Chrysler, are failing partly due to a disastrous pricing policy. Many institutions in academia are following closely behind those pricing policies of the failing auto firms.



The primary motive for raising prices, or tuition rates as they are called in academia, is the inability to control costs. As costs rise, and while they include not only faculty compensation which is typically about 25%, plus or minus, of total costs, these rising costs are increasingly driven by non-faculty costs ranging from custodial services, to campus security, to financial aid, departments enforcing equal opportunity, smart but rarely used technology in very expensive classrooms, etc., etc., etc. The bottom line or profit (or surplus in not-for-profit segment of academia) decreases, and ultimately the red ink of losses occurs and grows larger.

To connect with the world or reality, we now will examine one such cost of academia, the total benefit packages (wage and non-wage benefits) for professors. Since we at the New Economic Paradigm Associates are economists, we begin with economics professors and then broaden the analysis.

U.S. Department of Labor

Bureau of Labor Statistics
Occupational Outlook Handbook, 2010-11 Edition
(Teachers—Postsecondary)
http://www.bls.gov/oco/ocos066.htm

25-1063 Economics Teachers, Postsecondary
http://www.bls.gov/oes/current/oes251063.htm

Employment	Employment RSE	Mean hourly wage	Mean annual wage	Wage RSE
12,860	1.8 %		$89,320	1.3 %

Percentile wage estimates for this occupation:

Percentile	10%	25%	50% (Median)	75%	90%
Annual Wage	$42,820	$59,720	$81,170	$108,100	$144,750

U.S. Department of Labor

Bureau of Labor Statistics
EMPLOYER COSTS FOR EMPLOYEE COMPENSATION – JUNE 2010
http://www.bls.gov/news.release/pdf/ecec.pdf

Table 2. Employer costs per hour worked for employee compensation and costs as a percent of total compensation: Civilian workers, by occupational and industry group, June 2010

Series	Total compensation	Wages and salaries	Benefit costs				
			Total	Paid leave	Supplemental pay	Insurance	Retirement and savings
	Cost per hour worked						
Junior colleges, colleges, and universities	44.94	31.15	13.80	3.75	0.14	4.23	2.90
	Percent of total compensation						
Junior colleges, colleges, and universities	100.0	69.3	30.7	8.3	0.3	9.4	6.5

In academia, tuition rate increases have become the new "sticker shock" having replaced the traditional American nameplates of the auto industry as the big sticker shockers.

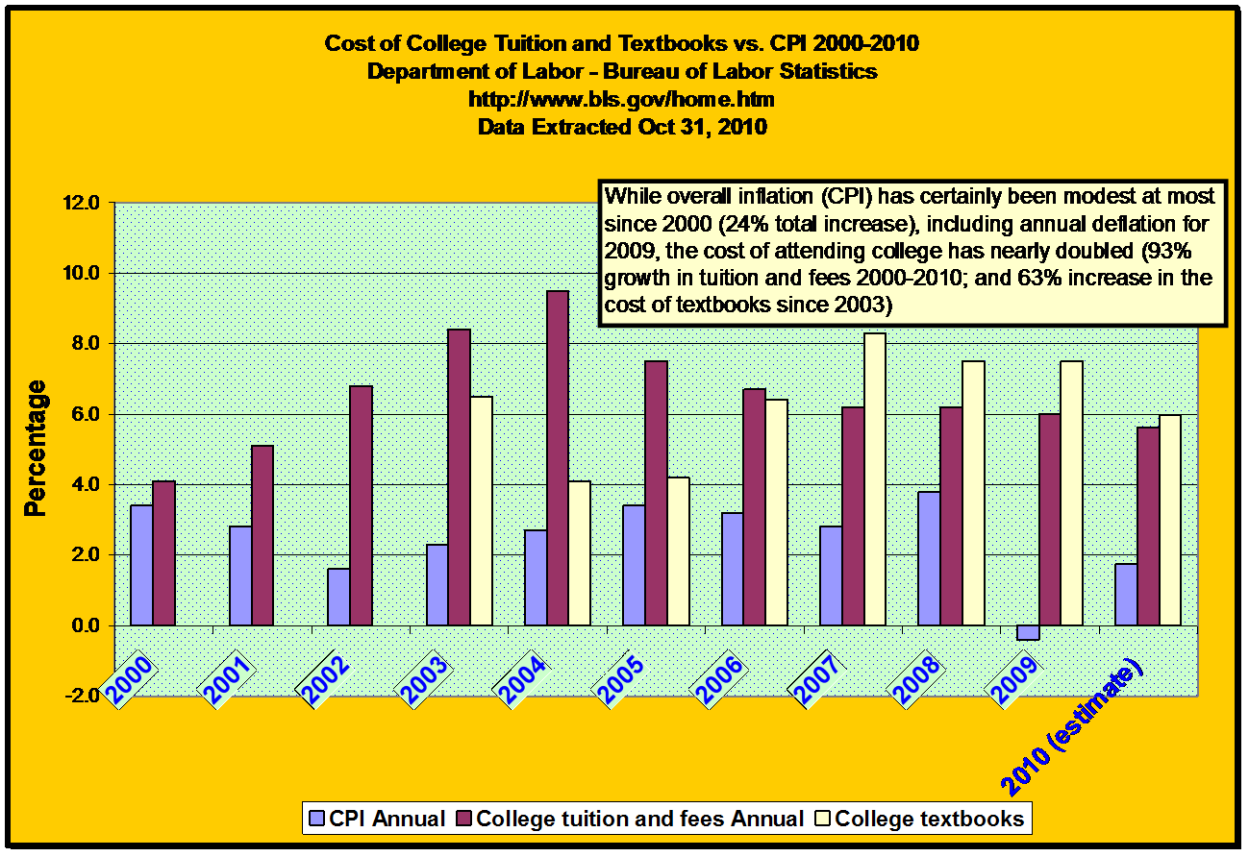
In both the electronic and print media, news items feature college graduates trying to cope with tuition loans, very often totaling in the five and even six figures (to the left of the decimal point). Some say they would gladly give up the degree if it would wipe out the student loans they owe. A growing crisis is already here.

Corvettes cost less than college
Detroit News Sept 24, 2010
Froma Harrop

http://detnews.com/article/20100924/OPINION03/9240329/Corvettes-cost-less-than-college

> *"The number of administrators per student at colleges has about doubled over 30 years, according to Hacker and Dreifus. Their titles point to such questionable duties as "director for learning communities" and "assistant dean of students for substance education.""*
>
> *"Full-time faculty members are being paid more for teaching less. Some elite colleges now offer sabbaticals every third year instead of the traditional seventh. Harvard has 48 history professors, and 20 of them are somewhere else this year."*

Rising even more rapidly than professors' compensation packages, are the costs of textbooks. To throw salt in the financial wounds of students, so to speak, is attempt by publishers to accelerate knowledge obsolescence at a far faster rate than justified by reality. Instead of every several years, revisions have to be steadily increased to as few as two years for an increasing number of textbooks. In some cases, revision consists mostly of juggling chapters, changing a few chapter titles, and altering the end of chapter review material. Professors and college administrators seem to be willing to go along with is practice. At the community college level when government heavily subsidized tuition, textbooks rival the tuition costs for a course.



PRICING COLLEGE CREDIT HOURS

A common error among college administrators and Boards of Trustees is the belief that increases in tuition rates (per credit hour) will at least increase total tuition revenue. Some even naively believe that a tuition rate (price) increase will increase tuition revenue proportionally. What is the weakness of these arguments?

College education is a product that must be sold to buyers just as is a hamburger, an automobile, or a bottled beverage. Some are beginning to see college education as an investment in a capital good, human capital. On rare occasions, a few speak of the rate of return on this investment in human capital. On even rarer occasions does the cost of capital to finance the human capital investment become integrated into the analysis.

Human tragedy can be the result as the college education financing overhang makes a happy life for the college graduate increasingly difficult to

experience. Wake up college administrators, boards of trustees, faculty and legislators mandating all of these socially driven costs for higher education. The crisis is already here.

College grads: $24,000 in debt
CNN Money Oct 22, 2010
Blake Ellis

http://money.cnn.com/2010/10/22/pf/college/student_loan_debt/index.htm

"College seniors who graduated last year owed an average of $24,000 in student loan debt, up 6% from the year before, according to a report from the Project on Student Debt. The data, released on Thursday, is based on an annual analysis of student loan debt at more than 1,000 public and private nonprofit four-year institutions."

Now we turn to the sorely lacking and much needed analysis of pricing a product, INCLUDING tuition rates.

The relationship between the amount [quantity demanded] of the product (in our focus it is the number of credit hours of college education that potential students will buy) at each price or tuition rate, is called "demand" by economists. Nearly all demand relationships (usually referred to as demand curves by economists) facing a firm, including institutions of higher learning, behave in a general way that is consistent with the Law of Demand. As the price is increased, the quantity demanded of units of the product (credit hours) decreases. As the price is decreased, the quantity demanded of credit hours increases, ALL ELSE EQUAL. Economists refer to this as an inverse relationship of quantity demanded of the product to the price of the product.

There are few exceptions to this law. The exceptions are rare, famous, and usually short lived. A Giffen Good is one such exception. It was the name given the phenomenon that caused a third of the Irish in the mid 1800s to die, a third to migrate to other nations, and most of the remaining third, to suffer at near subsistence levels. The potato famines were the culprit. In this case, Lord Giffen noticed an extraordinary behavior of the Irish people. As the price of the potato increased, they purchased greater quantities of potatoes, not less of them. Such goods are rare and college education is NOT, REPEAT, NOT one of them.

Why in nearly all cases, does quantity demanded of a good or service, including credit hours, change in the opposite direction as the price of that good or service (in our case, as the tuition rate)?

SUBSTITUTION AND INCOME EFFECTS

When the price of a good or service changes either by increasing or decreasing, two economic responses in the behavior of the buyers occur. Since increasing tuition rates has been the pattern over recent years, this discussion will examine the responses to such increases.

SUBSTITUTION EFFECT

In nearly all cases, the response by a buyer to a price change is predominantly the substitution effect. As the price of a good or a service increases, buyers will defect or switch to substitutes whose price has risen less, stayed the same, or fallen. The more substitutes a good or a service has and the better substitutes they are, the stronger is the substitution effect. The stronger is the substitution effect, the larger will be the reduction in quantity demanded (of credit hours taken by students in our case) for a given increase in price (tuition rate).

So what you say?

Total revenue, the top line, is the units of product (credit hours for which the student registers) times the price (tuition rate per credit hour). Since human response to a stimulus takes time, the quantity response to a price change tends to increase as time passes. Total tuition revenue is the tuition rate times the number of credit hours for which the students register. The total tuition revenue can rise OR fall when the price or tuition rate rises. It all depends upon the extent of the percentage decrease in the quantity demanded of credit hours by registering students. The stronger the substitution effect, the greater the reduction in quantity demanded of credit hours by students. This means that a given percentage price increase will increase *total tuition revenue by a smaller percentage than the percentage price increase*. In fact, total tuition revenue can decrease in response to a price or tuition rate increase if the substitution effect is strong enough. This issue will be examined shortly.

Hang on and be patient. Good analysis takes time.

Economists have a name for this relationship between price, quantity demanded, and the effect on total revenue. It is called price elasticity of demand. If in response to a price or tuition rate increase, total tuition revenue increases, the price range in which the price change occurs is said to be relatively inelastic.

What does relatively inelastic mean?

It means that the percentage reduction in the quantity demanded of credit hours is less than the percentage increase in the price or tuition rate per credit hour that caused the reduction in the quantity demanded of credit hours, all else equal. For example, if a 5% increase in tuition per credit hour causes a 3% reduction in credit hours demanded by the registering students, demand for college education in that price range is said to be relatively price inelastic

What does all else equal, mean? We are looking only at the effect of price increases on the change in quantity demanded of credit hours. We have to filter out the effects of such things as the demographic effects as they can alter the size of the pool of potential college students; the state of the economy as prosperity can increase the opportunity cost of attending classes just as recessions can lower that opportunity cost, etc, etc., etc.

If a service such as college education has many good substitutes to which a student can switch, the substitution effect will be strong. What are the reasonably close substitutes for Boola University credit hours? Enrolling at other institutions of higher education is a pretty good substitute. To some students, the lure of earning an income by working instead of going to classes is also a pretty good substitute.

Over the past half century, there has been an explosion of on-site competitive options facing potential and existing Boola U students. community colleges, each with several branches (Wayne CC, Oakland CC, Macomb CC, etc.), major universities opening branches many miles from their main campus but reasonably close to the Boola U campuses (University of Toledo, U of M, MSU, University of Detroit Mercy, Eastern Michigan University, Wayne State University, Davenport University, etc.) are part of the increasingly on-site competitive environment facing Boola U.

In the last few years, another reasonably close substitute has hit the higher education market in Southeast Michigan and elsewhere. Online or distance

higher education has expanded the supply of higher education dramatically. Some well-known schools, such as University of Phoenix as well as Regis College, State University of New York, University of California-Berkeley, University of Maryland, etc. seek enrollment from students living in the market area of Boola U's onsite and online programs. Some of these online programs enroll 50,000 to 100,000 students each year; often in full degree programs, both undergraduate and graduate. We are in the "Brave New World" in higher education.

Sloan Report on Online Education
Learning on Demand: Online Education in the United States, 2009
http://sloanconsortium.org/publications/survey/learning_on_demand_sr2010

The evidence: Online enrollments have continued to grow at rates far in excess of the total higher education student population, with the most recent data demonstrating no signs of slowing.

> *Over 4.6 million students were taking at least one online course during the fall 2008 term; a 17 percent increase over the number reported the previous year.*
>
> *The 17 percent growth rate for online enrollments far exceeds the 1.2 percent growth of the overall higher education student population.*
>
> *More than one in four college and university students now take at least one course online.*

Caution: Ignore this new reality at you own peril.

INCOME EFFECT

The other behavioral response of the buyers to a price change of the product (good or service) they buy is called the income effect. *For the large majority of goods and services, as the buyer's income increases, they demand a larger quantity of the good or service in question at each price. As the buyer's income decreases, they buy less of that good at each price.* Such goods are called normal goods. A very few goods display opposite effects as

a buyer's income increases and decreases. These few goods are called inferior goods. One of the few examples of inferior goods is a "soul food" which is part of every population group: potatoes for the Irish, cabbage for Eastern Europeans, collard greens for African Americans, etc. As the income of those in each of these groups increase, they buy less of the "inferior" goods and more of other "normal" goods. This was what caused the Irish during the potato famine to be willing to buy more potatoes at higher prices. In relatively rich nations like the U.S., many of these soul foods are part of nostalgic feelings and have become normal goods. The important thing here is that the quantity demanded of these goods that are normal, as most are, increases as income increases and decreases and income decreases. Only the rare few inferior goods behave in the opposite manner. Higher education is definitely a normal good.

The argument that demand for education seems to increase at least in the early stages of an economic downturn is primarily a result of a fall in the opportunity cost due to the diminished availability of jobs for potential students. If little or no work is available, the opportunity cost is lower than if part and full time jobs were abundant. Also it should be noted that with emergence of online education, the student can complete the required work at non-working hours, also reducing the opportunity costs of earning college credits.

Let's go back to the income effect. When the price of a good increases a smaller quantity of it can be purchased for the same expenditure. To the extent the buyers continue to buy it, their same dollar value budget spent, receives a smaller quantity in return. It is as if the buyers' income decreased. As the price of a good increases, according to the income effect, a smaller quantity of normal goods will be purchased. This income effect for normal goods, which includes the vast majority of goods and services including higher education, causes less to be purchased when the price of a good or service increases. Since nearly all goods and services are normal, as the price of these goods or services increase (increase in the tuition rate for credit hours of college education), the quantity demanded of credit hours by students decreases as the income effect reinforces the substitution effect.

For a given tuition rate increase per credit hour (assume a 5% increase), total revenue (price time quantity demanded or tuition rate times the number of credits hours taken) will rise LESS than proportionally to the price or less than 5% in this case. In fact, it is very possible that the price increase can result in a DECREASE in total tuition revenue.

Why? Because the quantity demanded of credit hours can decrease by more than 5%, which is the percentage increase in the price of a credit hour. *The relationship of the price change to the change in quantity demanded and the resulting change in total revenue is called by economists, the price elasticity of demand.*

PRICE ELASTICITY OF DEMAND AND TOTAL TUITION REVENUE

When a firm raises the price of its product, the ensuing total revenue from that product it sells may increase, be constant, or decrease. It all depends upon the quantity response to a price change for that product. Will total tuition revenue rise, fall, or stay constant when the tuition rate (price per credit hour) is increased? Recall that the major reasons for the change in quantity demanded to a price change are the income and substitution effects. For normal goods including college education, the income effect reinforces the substitution effect and together they determine the reduction in quantity demanded to an increase in price.

The technical meaning of price elasticity of demand and its implications for the determination of the optimal tuition rate will now be examined.

Each of the colleges and sometimes some of the majors and graduate degrees within colleges are in different markets and display different price elasticities of demand.

One of the reasons for this is the income that can be earned when the degree is completed. The differences are substantial. Social workers will earn less than most CPAs and electrical engineers. The extra earning power will be reflected in the higher discounted present value of those earnings or the so called internal rate of return on the education expenses that enable those earnings to be achieved. Students will pay more for medical school tuition or engineering school tuition because they will earn a higher rate of return after graduation than if social work or fine arts was their career goal. Is the current level of tuition rates optimal? Each college within a university and each program within each college must be analyzed separately. There is also a cost side that should be considered, but that is beyond the scope of this analysis.

Another consideration of importance is the status of the student within the program. To the degree that a transfer to another institution of higher education will increase the total number of credit hours needed, a student will be more reluctant to transfer to another institution in response to a tuition rate increase. Technically, the substitution effect is less for a senior than a junior, and less for a junior than a sophomore and so on. Although as competition increases, this is becoming less of a problem. Residency requirements have become more liberal and there are now many 2+2 and 3+1 formal agreements between community colleges and four year academic institutions as well as other similar informal arrangements.

2+2: two years at a community/junior college; eligible to transfer up to two-years toward a four-year degree program at senior college level (junior and senior year)

3+1: three years at a community/junior college and one additional year; eligible to transfer up to three-years toward a four-year degree program at senior college level (senior year)

This means as little as the last year is all that is needed to meet the residency requirement.

An even more widespread phenomenon has occurred with the growth of community college enrollments and their much cheaper tuition rates. These community colleges thrive on the 2-2 agreement with four year colleges and universities. The residency requirement of the institution granting the baccalaureate degree is two years in the 2-2 arrangement and one year in the 3+1 arrangement. Such reduced residency requirements increase the substitution effect for freshmen and sophomores as well as for juniors in the 3+1 arrangement. Since transferring such credits has been substantially liberalized, it has significantly increased the substitution effect. This means that the price elasticity of demand has increased. This in turn means that tuition rate increases are LESS revenue enhancing and if the tuition rate is currently in the relatively price elastic range, tuition rate increases will actually reduce total tuition revenue from those programs.

There is a mathematical formula for price elasticity of demand. It is the relative or percentage change in quantity demanded divided by the relative or percentage change in the price of the good or service that caused the change in quantity demanded, all else equal. Other changes such as an independent change in income due to a recession or economic expansion

must be muted by the statistical routine being used to correctly measure price elasticity of demand.

$$\frac{(QD1 - QD2)/QD1}{(P1 - P2)/P1}$$

$$\frac{(10{,}000 \text{ credit hours} - 20{,}000 \text{ credit hours}) / 10{,}000 \text{ credit hours}}{(\$3{,}000 \text{ per credit hour} - \$2{,}000 \text{ per credit hour})/\$3{,}000 \text{ per credit hour}}$$

$$\frac{-1}{1/3}$$

PED = -3

This price decrease from $3,000 per credit hour to $2,000 per credit hour results in an increase in total revenue, moving from $30 million to $40 million.

An analogy with the Big Three of the U.S. Automotive Industry

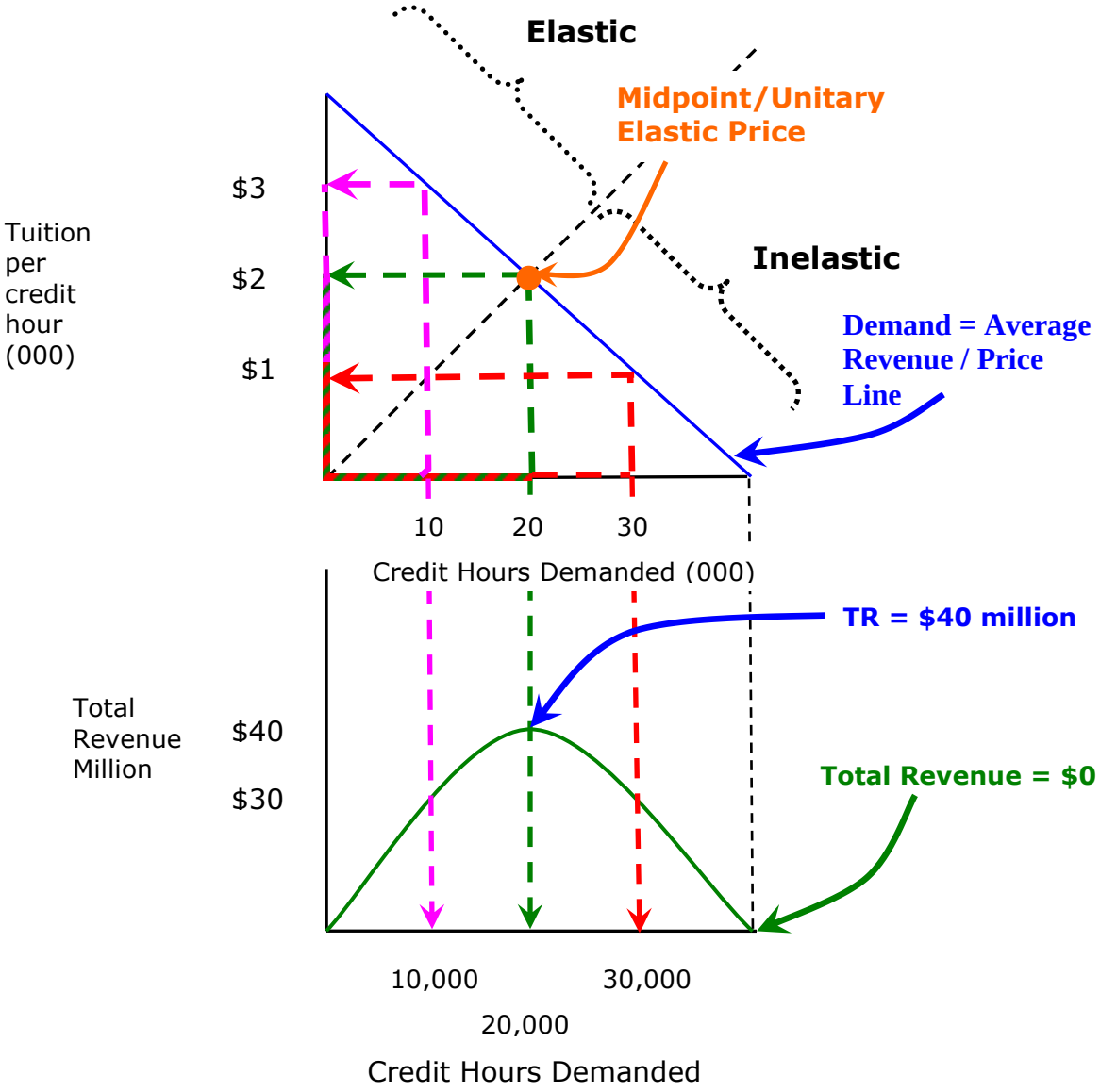
Price Elasticity of Demand --- Tuition

For an example of when the tuition rate should be lowered, one has only to look at the current problems facing General Motors and the rest of the Big Three. If one or more of them raise prices, then they lose sales to the transplants and suffer a reduction in total revenue. In fact, General Motors, Chrysler, and Ford as well, have passed the point where price increases are even an option. Over the past several years, real or inflation adjusted prices of autos have actually dropped significantly (from 1997 through 2003, they dropped nearly 6%). They are cutting costs just to remain competitive in the market. Outsourcing and accelerated automation are but two cost cutting techniques. By the way, whether we like it or not, those of us who live in Michigan are finding out that what affects the Big Three, affects us. One such cost cutting measure is the reduction and often the elimination of the reimbursement to employees for college tuition. That is effectively a raise in tuition rates to such students employed by the cost cutting firms.

This concept of the relationship of price to total revenue or in our case, of tuition rate to total tuition revenue, can be seen graphically. The demand for Boola U credit hours is shown graphically and the behavior of total tuition

revenue is shown just below it. In order to simplify the explanation, a straight line demand curve is used. The vast majority of demand curves for goods and services would be consistent in a general manner with the following argument even if the demand curves are curvilinear.

Average Revenue (top) and Total Revenue (bottom)



Using the above illustration…Starting with the top picture (Average Revenue/Demand Curve) – from a tuition rate (y or vertical axis) of $1,000 per credit hour…moving up to $2,000, the quantity demanded moves from 30,000 credit hours to 20,000 (x or horizontal axis). In looking at the Total Revenue picture below, you find that the movement, in spite of the drop in quantity demanded, still translates into greater revenues (from total revenue of $30 million to $40 million).

However, if you continue to raise prices higher (past the Midpoint/Unitary Elastic point shown above), your revenue will fall (going from total revenue of $40 million to $30 million).

If we start at a price of zero, total revenue will be zero. As we raise the price and move up and to the left along the demand curve, total revenue increases, but at a decreasing rate. This can be seen immediately below where the corresponding total revenue curve is shown. Total revenue can also be calculated from the demand curve directly by multiplying each price times its corresponding quantity demanded. It is the area of that rectangle. By using calculus, the total revenue counterpart is seen just below the demand curve as the vertical height at each quantity demanded for each price at various levels.

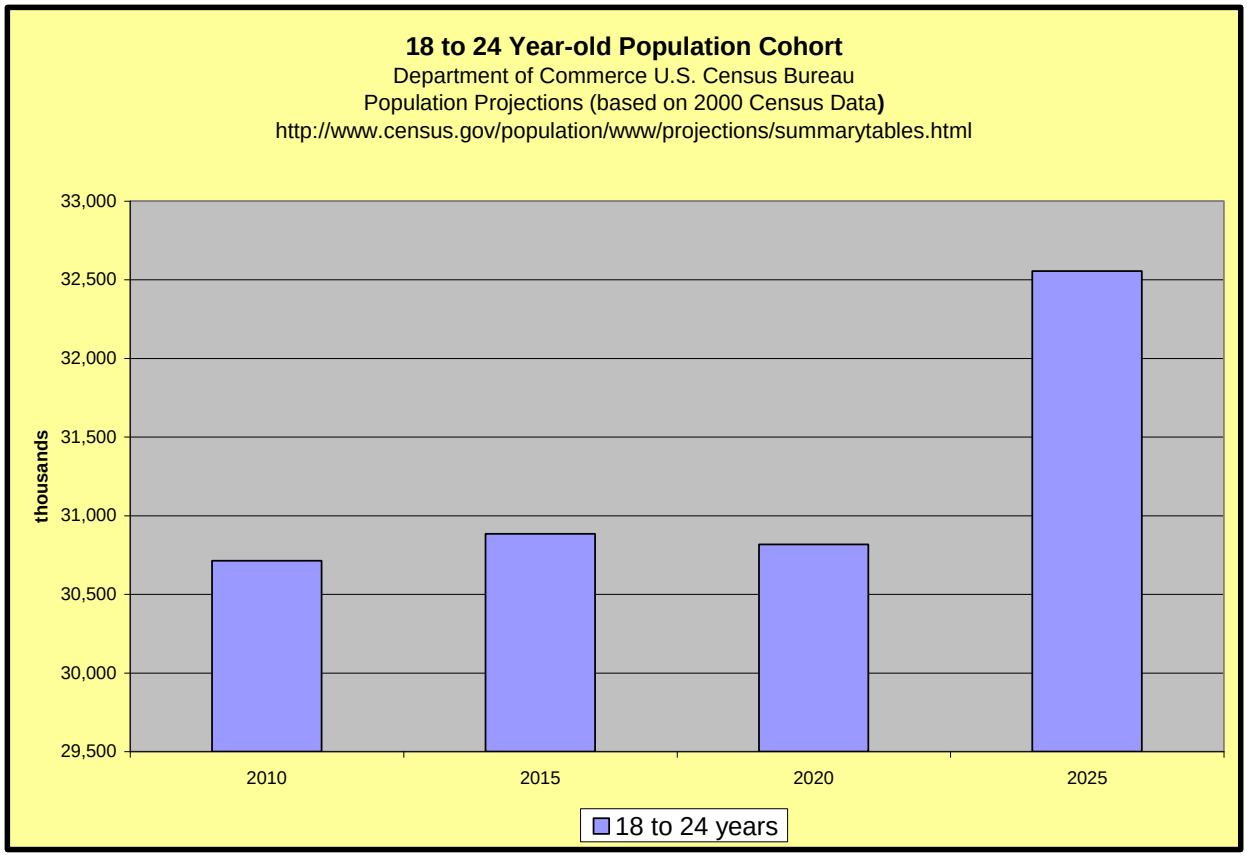
Total revenue reaches its maximum when the price corresponds to the mid-point along the demand curve. Here the coefficient of price elasticity of demand is one. At this price, price elasticity of demand is said to be unitary. As price is increased further, total revenue decreases. Maximum total revenue is not necessarily the optimum since costs are ignored in this analysis. We are just examining the relationship of total tuition revenue to the price or tuition rate per credit hour. If the tuition rate continues to be raised above the mid-point of the demand curve for Boola U credit hours, total tuition revenue decreases at an increasing rate until it reaches zero. In this relatively price elastic range above the midpoint of the demand curve, only a reduction in the tuition rate will increase total tuition revenue.

PRICE ELASTICITY AT EACH PRICE CHANGES OVER TIME

Price elasticity of demand is not a static measure but can change and usually does as other factors influencing the quantity demanded change independently of price changes. We have mentioned some factors above. An independent reduction in income due to a recession decreases the demand (assume a parallel shift of the demand curve downward or to the left). As a result, at each price, price elasticity of demand has increased and reduced the revenue enhancing capability of tuition rate increases. In fact, if the price increase is now in the upper half of the new demand curve, pr ice

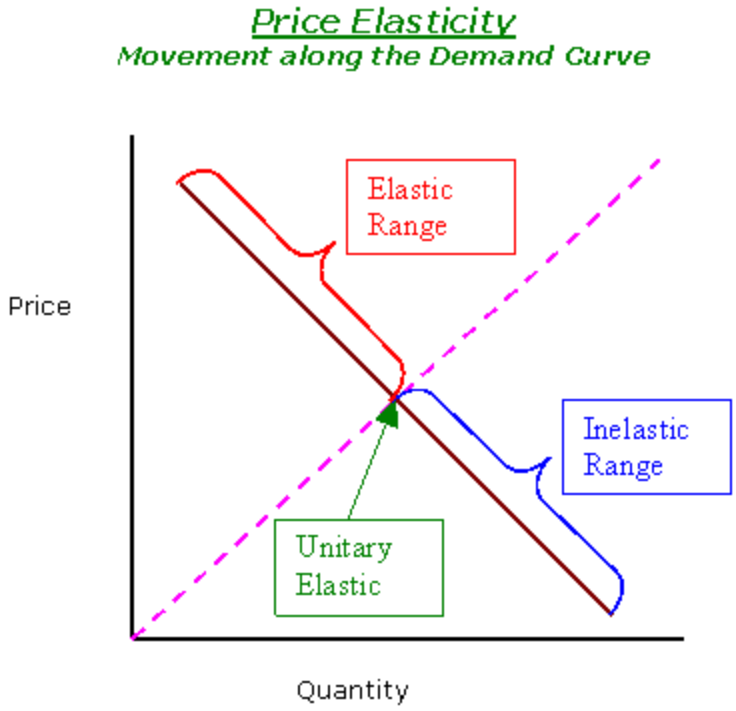
or tuition rate increases will actually reduce total tuition revenue. Economic expansion increases demand and decreases price elasticity o f demand at each p rice, increasing the revenue enhancing capability of price increases in the inelastic range of the demand curve that faces the institution in question.

Generally, those factors that increase the quantity demanded at each price, decrease price elasticity of demand at each price. Those that decrease the quantity demanded at each price, increase the price elasticity of demand at each price. If the number of competing institutions in the same market area increases, since that increases the substitution effect, the price elasticity of demand increases. The market area for on line programs is virtually world wide and is potentially much more capable of decreasing the demand curve of existing institutions of higher education and increasing the price elasticity of demand at each tuition rate. On site programs usually need to be within a reasonable distance in order to be competitive. Also mentioned was the liberalization of residency requirements which increases the price elasticity of demand, even for upper classmen. Demographic factors can change the demand for higher education. A rise in birth rates occurred around 1983. With an 18 year lag, the college age pool of students began to increase. The birth rates began to slow around 2000 or thereabouts. Demographers are warning of a drop-off or flattening in the college age pool in the near future.



Factors that increase the price elasticity of demand reduce the revenue enhancing capability of price or tuition rate increases. Factors that decrease the price elasticity of demand have the opposite effects on total tuition revenue when tuition rates are increased.

A general warning is in order. The average of tuition rates at all institutions of higher learning, public as well as private, has been rising and is closer to the mid-point of the market demand curve, and in some programs, above that mid-point. Revenue enhancement through increasing the tuition rate is being exhausted. In cases where the price or tuition rate is above the mid-point of the demand curve, only tuition rate decreases can increase total tuition revenue.



If you raise tuition when you are in the elastic range, this results in lower total tuition revenues.

Price Discrimination

One of the nastier side effects of the growing financial distress of institutions of higher learning, especially when government subsidies of various types have slowed their growth and in some states have fallen substantially, is that any two students rarely pay the same tuition rate. A variety of grants, (called discounts in the business world as in the auto industry), have raised the financial assistance packages to dizzying heights and require financial aid officers to practice fine and performing arts, to a degree that would dazzle the world of entertainment. Combine this development with the ever increasing need for student loans, and it is no wonder that some are beginning to think the rocky road travelled by the Former Big Three in the U.S. automotive industry is the path higher education in the U.S. is now traversing.

Some parting thoughts

Why the recent opening of a myriad of branches and the huge growth in various forms of distance learning including on line education? As is the case for many products, both goods and services, convenience is a critical aspect of the overall characteristics of a product. Travel time and costs, conflicting needs of the buyer in any given time period, and during normal economic times, lost labor compensation from attending more traditional on site education, have all played a role in the rapid growth of branches and distance learning programs. In the last five years, the enhanced oil cartel has more than doubled the prices of gasoline and diesel fuels needed to bring the students to on site campus locations. Room, boarding, and tuition costs are becoming too high in many cases for the traditional delivery of the educational service. You are witnessing a dramatic change in the delivery vehicles. To paraphrase an old adage, if the person cannot get to the mountain, the mountain will have to get to the person.

Some of these factors increase and decrease in importance, but most of them are now a more permanent part of our modern higher education scene.

Once again, ignore at your own peril.