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ABSTRACT

Empirical research on the effects of price rises on college attendance is reviewed. Emphasis is placed on the validity and usefulness of an approach to postsecondary pricing increasingly being employed in the public sector. This approach, which is labeled the targeted subsidy approach, stresses that greater equity and fiscal efficiency result from moves away from low tuition policies toward higher tuition levels and higher levels of student aid funding. The evidence suggests that responsible movement toward a targeted subsidization financing scheme should not appreciably affect enrollment rates in the long run. The view that significant tuition rises necessarily threaten equality of educational opportunity is labeled as myth. Although the value of the targeted subsidy approach is generally upheld by the review, caveats are suggested regarding three of its central assumptions: the rational actor assumption, the "ceteris paribus" assumption, and the "efficient delivery" assumption. Suggestions for further research focus on the need for greater knowledge regarding individuals' processing of information as they make their college-going decisions. A 10-page bibliography is appended. (SW)

THE ENROLLMENT EFFECTS OF POSTSECONDARY TUITION RISES: FACTS, MYTHS, AND UNKNOWNS*

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The Enrollment Effects of Postsecondary Tuition Rises: Facts, Myths, and Unknowns

Abstract

Arguments over student aid funding and tuition rises involve disputes not only over values but also over facts. This paper reviews empirical research on the effects on attendance of price rises in postsecondary education, with a particular emphasis on the validity and usefulness of an approach to postsecondary pricing increasingly being employed in the public sector. This approach, which we label the "targeted subsidy" approach, stresses that greater equity and fiscal efficiency result from moves away from low tuition policies toward higher tuition levels and higher levels of student aid funding. We find strong factual support for the approach, and therefore label as myth the view that significant tuition rises necessarily threaten equality of educational opportunity. Although the value of the targeted subsidy approach is generally upheld by the review, the paper nevertheless suggests caveats regarding three of its central assumptions: the "rational actor" assumption, the "ceteris paribus" assumption, and the "efficient delivery" assumption. Suggestions for further research focus on the need for greater knowledge regarding individuals' processing of information as they make their college-going decisions.

The Enrollment Effects of Postsecondary Tuition Rises: Facts, Myths, And Unknowns

The last few years have been marked by heightened public debate over the financing of postsecondary education in the United States (Heyns and O'Meara, 1982; Hansen, 1982; Breneman and Finn, 1978). Many states and the federal government have begun to reexamine how public resources should be used to subsidize education. The primary impetus for these deliberations has been pragmatic. The obvious constraints on public resources in an era of enduring economic malaise, the increasing costs of providing basic postsecondary services, and the daunting price tags attached to maintaining quality education in a technological age have made it virtually imperative to reexamine current approaches. Necessarily, however, long-disputed and more fundamental issues of public policy have come to play an important part in the pragmatically inspired debate. For example, what are the societal benefits from individuals' obtaining higher education, and how best are public subsidies employed to achieve the twin goals of equity and efficiency in education?

The controversy has been evident at both the federal and the state levels of government. One significant aspect at the federal level has been the perception of many that the middle class is being forced out of higher education by rising tuition costs and

by a federal government paying real attention only to lower income students' financial needs (e.g., see O'Hara, 1974). Although the passage of the heavily funded Middle Income Student Assistance Act of 1978 (MISAA) initially quieted the combatants on this front somewhat, arguments regarding the enduring validity of the "Middle Income Squeeze" perspective have once again come to dominate Congressional debates on student aid (see Hartle and Wabnick, 1982). At the state level (and in individual private institutions as well), the financing battles have primarily been joined over questions of tuition rises, and the fierceness of these debates has been no less than at the federal level. Powerful public pressures to restrain rises in tuition levels in order to maintain commitments to educational opportunity (Chronicle of Higher Education , August 3, 1983; Stampen, 1980; Minneapolis Star and Tribune , May 7, 1983) have come into direct conflict with ongoing financial constraints and quality concerns which often make resistance to tuition rises extremely difficult for administrators and legislators (Chronicle of Higher Education , February 29, 1984).

In the public sector of American higher education, these debates have crystallized rather neatly into two divergent approaches for financing student attendance--one the traditional approach of distributing public subsidies broadly through the maintenance of low public tuitions, and the other an emerging approach that relies on more targeted public subsidies, achieved through a combination of higher public tuitions and more generous financial aid aimed squarely at those with financial need. The traditional approach, which seeks to subsidize the education of

all able citizens regardless of financial need, is a logical outgrowth of the public school movement and reflects the general belief that the returns to society from a highly educated citizenry justify significant public expenditures on education. In contrast, the targeted subsidization approach reflects two "revisionist" philosophical premises quite out of step with the exultant rhetoric of earlier educational statesmen--first, because both the individual and society benefit appreciably from an individual's education, both should share a substantial portion of the cost of providing that education, and second, public expenditures for educational services should be provided in a manner that maximizes the difference between public returns and costs.

To some extent, arguments over these two distinct approaches are expressions of largely irreconcilable conflicts over values. Statehouses, student rallies, and the popular press are fertile and appropriate ground for debates over individual differences in concepts of freedom, social justice, and proper public policy.

But the arguments being heard are also arguments about facts, and those arguments comprise the focus of the present paper. The divergence in financing approaches has resulted in part from different perceptions of how most effectively to achieve goals over which there is very little value-based disagreement. In particular, virtually everyone accepts educational opportunity and equity as critically important goals for public postsecondary education, but there is disagreement over how best to achieve these goals. On the one hand, advocates of the traditional broad subsidy approach argue that the surest way is to keep the cost of

education low through large tuition subsidies (e.g., see Van Alstyne, 1974; Leslie and Johnson, 1974; Stampen, 1980). Advocates of the more targeted approach, on the other hand, contend that true opportunity and equity will most likely be achieved by focusing subsidies on those lacking financial resources (e.g., see Hansen and Weisbrod, 1969; Windham, 1976). The vagueness of the terms notwithstanding, the choice of the most productive path to equity and opportunity is at its core centered upon a concrete, empirical issue over which the two financing approaches are in heated dispute.

That central issue involves the effects of changes in college costs on students' attendance decisions. Undergirding the divergent approaches are opposing hypotheses about student behaviors under alternative financing scenarios. These hypotheses usually involve alternative answers regarding whether or not tuition rises of X dollars (or Y percent) a year, accompanied by certain parallel changes in student aid financing (often the raising of student aid for lower-income students), will cause deleterious declines or shifts in a state's enrollment patterns. Will a tuition rise of $400 at "State U" really cut enrollment by 20 percent? Will dollar for dollar balancing of financial aid increases for lower-income students against tuition rises really preserve attendance rates among the disadvantaged? These are factual issues for which there exists a coherent body of research, and that knowledge is too seldom being heard above the din of the current debates.

Accordingly, this paper reviews what researchers know, and do not know, about the effects of rises in the price of postsecondary

education. Particular, but not exclusive, attention is paid to one aspect of that topic very much in the public eye: rises in the levels of tuition charged at state-supported institutions. Revisionists argue that when a state moves toward higher tuition and higher, more targeted student aid, it is moving toward responsible, progressive public policy. Traditionalists argue that when a state does so, it is in fact (if not in intent) acting to constrain educational equity and opportunity for the poor and middle class: students will begin to downgrade their educational choices, or opt out of education altogether. Each side of the dispute has its eloquent champions. For example, consider the following statement by Theodore Mitau (1974, pages 155-56):

> "[A]s Steven Bailey wrote in Ethics and the Politician, 'The ultimate ethical postulate of a democratic society is not that man is good but that he is capable of good. Not that man is free from corruption but that he is desperately sick of it; not that man has created the good society but that he has caught a glimpse of it.' This is not the time to abandon the tuition policy which has made it possible to provide increasing numbers of Americans with something of an unforgettable glimpse of what a good society could be all about."

Unfortunately, moving claims of this kind, and the equally appealing counterclaims made by revisionist policymakers and analysts, have too seldom been backed up by systematic empirical analysis. The intent of the present paper is not only to contribute to the public debate on postsecondary financing, but also to propose an agenda for further research on this highly

visible aspect of the nation's educational system.

The Rationale for Targeting Postsecondary Subsidies

As discussed above, the dispute over postsecondary financing is both pragmatically and philosophically driven. Thus, the case for targeting subsidies by increasing public tuitions and increasing financial aid is based not only on the strains on the public purse but also on a particular conception of appropriate public policy. This conception, which is often referred to as the "market rationalization model," is not unique to education. It lies at the heart of a number of recent reforms in government housing policies, consumer protection policies, and airline regulatory policies (see, for example, Congressional Budget Office, 1983a,b). Its core tenet is that the public is best served by policies that strengthen market forces in consumer decision making. In the arena of postsecondary financing, a number of prominent economists and policy analysts in the rationalization school have argued that providing low postsecondary tuition as public policy is both inefficient and inequitable[1].

It is inefficient because a large number of students can afford to pay more than the going rate of tuition, and are thus getting an unneeded state subsidy. Many of these non-poor students would attend college anyway, and reap its many benefits in later income and status, so why should a state pay them out of its constrained resources without receiving anything new in return? Some non-poor students would no doubt choose not to attend college at higher prices, but is it efficient to provide a service to those who value it so little? These arguments gain more force when

one considers the paucity of evidence for measurable societal (as opposed to individual) benefits from higher education attendance. While such "externalities" form a prime defense for subsidizing the education of the non-poor (Bowen, 1977; Stampen, 1980), research has found little evidence of significant benefits to society in general (see Halstead, 1974; Windham, 1976; and various chapters in Solmon and Taubman, 1977).

From the efficiency perspective, therefore, a supply and demand model governed by market forces and characterized by targeted subsidies makes sense. The subsidy provided generally through reduced tuitions should be more modest than it is today in most states and should more closely approximate the benefit believed to be received by society in general. More substantial targeted assistance should be provided for those who cannot afford to attend without it.

Low tuition is said to be <u>inequitable</u> because it spends more money on the middle class and rich than on the poor. Even though the financial needs of the non-poor are far less than those of the poor, and their tax payments to the state are not all that much higher than those of the poor (due to the general tendency to regressivity in state taxes), non-poor families are far more likely to receive this state benefit (the tuition subsidy) than the poor. This is because they are far more likely to send their offspring to college (including the state-supported institutions) than lower income families. Therefore, for the poor, the benefits and costs of low tuition do not seem to add up quite as favorably as they do for the other segments of a state's population[2].

From this perspective, often called the tuition

"rationalization" perspective, matching educational costs with societal benefits and individual financial needs removes the perceived inequity and inefficiency by adjusting the prices paid by different income groups for their higher education. The process of tuition rationalization is shown graphically in Figure 1. There, it is apparent that as the amount of the blanket state subsidy (C minus T) falls, the amount of targeted aid for lower income students (A_L) rises essentially in tandem with the amount of tuition and fees charged students. Thus the amount lower income students face as a price (T minus A_L) remains unchanged. The amounts faced as prices by upper income students (T minus A_U) and by middle income students (T minus A_M) rise, however.

Ostensibly, a well-planned tuition rationalization approach should have few negative effects on attendance patterns. Families facing an actual net increase in educational costs (that is, middle and upper income families) are exactly those believed most indifferent to changes in costs. Those changes that do occur may, in fact, reflect appropriate consumer behavior--that is, some students may change their educational plans because of the value, or lack thereof, of the education to them.

In two ways, research findings support the notion that the tuition rationalization approach does not radically alter attendance patterns. First, a series of studies conducted in the early and middle-1970's indicate that changes in price have only a modest impact on college attendance[3]. Jackson and Weathersby (1975) and McPherson (1978) examine the various studies of price effects and develop summary estimates of the average price

elasticity of enrollments. Adjusting their estimates for inflation suggests that a rise in net price of $100 (in 1984 dollars) would, on average, conversely affect enrollments by about 1.25 to 1.5 percent. As demonstrated in The Price of Admission , a study by the California Postsecondary Education Commission (1980), this impact could affect tens of thousands of students in a large state. Yet the proportionate effects on overall enrollment must be considered small.

Second, the existing research demonstrates that changes in price have their most significant effects on the very population protected from price changes under the tuition rationalization approach: the lower income students. Though the studies disagree somewhat in their estimates of differences in price responsiveness among students from various income levels, all studies suggest that family income is inversely correlated with price responsiveness. The California Postsecondary Education Commission study (1980) estimates that "lower-income students are approximately twice as price responsive as middle-income students" and "high-income students are about two-thirds as responsive as middle-income students."

Figure 2 graphically illustrates this principle: the greater negative slope for the lower income groups conveys their greater sensitivity to prices. Among the upper income groups, however, virtually no changes appear in their decisions as to whether or not to attend college when higher education costs rise. In other words, a gain in price from P_1 to P_2 in the Figure lowers attendance by more among lower income groups than among middle income groups, and by more among middle income groups than

among upper income groups (i.e., $X_L > X_M > X_U$). This reflects the axiom that it takes a larger amount to noticably dent the disposable income and liquid assets of the non-poor, and thus it takes a larger amount to affect their attendance decisions.

In combination, these two sets of research findings support the general position chat tuition rationalization has little overall impact on postsecondary participation. Reasonable increases in tuition, unaccompanied by rises in student aid, are unlikely to have large impacts on many students. Moreover, whatever modest impacts "raw" tuition rises are likely to have will be strongly muted by the parallel targeting of increased student aid on the students most likely to be sensitive to upward changes in price.

A critical assumption in the targeted subsidy approach is that financial aid is a perfect substitute for low-tuition for folk with financial need. In other words, this approach assumes that educational decisions, to the extent that they are affected by educational costs, are affected only by the net price facing the students and their familes, not by the composition or form of the subsidies provided. Because the actual price faced by students is educational costs minus whatever financial aid is available to the student, exchanging low tuition for equally generous financial aid should not alter attendance decisions. In Figure 2, for example, there would be no rise in the true price of attendance for the lower income group and thus no fall in attendance. Thus the state, by substituting student aid one-to-one for the lost subsidy to the poor, can make the poor theoretically indifferent

to the tuition rise. Their college attendance rates (and their specific institutional choices, as well) should in the end be unaffected by the changes in tuition and student aid.

The middle class, from this perspective, will experience a rise in the price of their attendance at state institutions, since this group would receive less in total because of the reduced tuition subsidy (see Figure 1). The upper income group would receive no new student aid to offset its higher prices faced. The number of lost middle and upper-income attendees (X_M and X_U), however, is expected to remain relatively constant in the face of the rises. Indeed, any loss would logically result from rational economic decisions by some consumers not to purchase a service (in this case, education) that has little value to them personally.

So goes the theoretical and philosophical argument for the targeted subsidization approach. But what are the pragmatic considerations? If the approach proves sound, there is much to be gained. Public funds will be allocated more efficiently, without jeopardizing the goals of equity and equality. But more importantly, the additional resources garnered from this approach can be used to enhance the quality of education provided by public institutions--to keep public postsecondary education competitive in a rapidly changing environment. Without these resources, public postsecondary education simply may not be able to provide more than mediocrity.

If the approach fails, however, the costs to individuals and society will be great, because the stakes are high. If significantly lower proportions of high school graduates choose to

attend public institutions, as the opponents of the targeting/rationalization approach argue, concerns regarding not only educational equity but also the well-being of the state choosing the approach.

Two effects on the state treasury will be quickly felt: the state will have lower student aid, educational, and tuition subsidy expenditures than if attendance rates had remained constant, but it will also take in lower than forecast levels of revenues (from both tuition payments and federal sources). Furthermore, revenue and outlay flows will be similarly affected by the extent to which students might attend lower cost state institutions in lieu of the "flagship" public campuses. Beyond these possible short-term effects on the states, the quality of training of human resources may eventually be affected as well, potentially leading to declines in future income tax revenues. Thus, the tuition and student aid changes could affect students' attendance decisions and, through that influence, may also indirectly produce ripple effects on the financial future of the state. The dispute over the targeted subsidization approach is not, therefore, over trivial stakes, from either the social or the economic perspective.

For the reasons outlined above, the choice of the targeted subsidization approach has extremely wide-ranging implications. The main focus of this paper, however, is limited to a discussion of <u>its initial effects on student enrollment patterns (i.e., who goes to college and where they go)</u>. The research evidence and theoretical and pragmatic reasoning in favor of targeting state subsidies, as outlined above, are quite strong, but there are a

number of questions that may be raised. The intent in each section below is to enrich the current debate through a critical review of this public policy approach.

Questions Regarding the Targeted Subsidy Model

In accepting the above reasoning, researchers and policymakers accept certain hypotheses regarding the likely effects of selective price changes on student attendance patterns. These hypotheses suggest the effects will be minimal if rationalization is undertaken responsibly. In general, we agree. The rationalization of postsecondary pricing makes sense on the grounds of both equity and efficiency. A number of questions may legitimately be raised about the targeted subsidy model and its associated hypotheses, however. Each involves areas where the model's enrollment assumptions might "go wrong." When the underlying assumptions go wrong, needless to say, the potential for policy failures grows exponentially.

The targeted subsidy model is based on three important assumptions: that students will act in the knowledgable, orderly way the model assumes (the rational actor assumption), that other factors will not disturb the effectiveness of the changes (the ceteris paribus assumption), and that a revised financing scheme relying more on student aid than tuition subsidies can be made to work well (the efficient delivery assumption). Each of these assumptions deserves closer scrutiny.

The Rational Actor Assumption : Serious questions can be raised about the underlying conception of human behavior assumed

in the model. That conception is in essence the classic economic notion of the "rational man". As usually conceived, "homo economicus" is assumed to have perfect knowledge regarding the prices in question and their associated returns, to be infinitely sensitive to differences in the prices, and to make decisions in a "rational" (i.e., economic) manner (see Edwards, 1954). The conception suggests that the prospective higher education student bases his or her attendance decision primarily on the "net price" of the product or products under consideration, i.e., on the personal costs of attendance minus any subsidies delivered to the student to offset those costs (e.g., state or federal student aid, private student aid). If the net price, so calculated, exceeds his or her expected benefits in consumption or investment terms, the prospective student will not choose the educational option at that price[4]. This rational actor conception is assumed to apply both for the choice between two or more institutions and the choice between college attendance and nonattendance.

When this conception is contrasted with the interpretations and experiences of most college attenders, some important contradictions arise. Students and their families may indeed in many ways seek and even achieve rationality in their behaviors, but not always in the sense posited by the model.

First, consideration of the usual chronology of the students' college decision making leads to serious doubts about the meaningfulness and importance of net price in college attendance decision making. That chronology is substantially more chaotic than the targeted subsidy model usually assumes. For example, public sector tuition rises are often not announced until just

prior to the academic year, too late to play a central role in fundamental decisions about feasible choices. Even when tuition levels are known, there can be a "messiness" about college decisions quite different from the assumptions of the model:

> Now student and family face the series of crises-acceptance or rejection letters. Comparatively, rejections are easy; acceptances cause the trouble. Some colleges use a continual admissions policy, giving accepted students two or three weeks in which to reply. Others have a fixed date for notifying students. Obviously, these methods conflict, leaving the student with the dilemma of having to tell college X yes or no before hearing from college Y or Z. And even when Y and Z announce their decisions, the various financial aid packages are so complex that trying to determine what it will really cost to send a student to Podunk State or Old Ivy is like predicting the weather for March (Baldwin, 1983).

The essay cited above was written by a parent who is also a college professor. For parents less well educated or familiar with the college setting, the indeterminacy of the admissions, acceptance, and attendance decisions must be even more trying. There may never really exist at any given point in time a set known net prices for students and their families to judge in the precise fashion suggested by the classic conception.

Second, it is not only the chronology of attendance decision making that thwarts parents and students reasoning along net price lines: recent research indicates that the knowledgability of students and their parents about the forms and terms of student aid is sadly inadequate. For example, Olson and Rosenfeld (1984) found that in 1980, 55 percent of the parents of prospective college students knew nothing of the Guaranteed Student Loan

program, and 52 percent knew nothing of the Basic Educational Opportunity Grant [BEOG] program (now the Pell Grant program). Even among parents with incomes under $10,000 a year, over half knew nothing of the BEOG program. On top of this lack of basic information, the public has often in recent years been grossly misled by press reports of exorbitant tuition increases and slashes in financial aid, according to Longanecker (1978), Gladieux (1983), and others. Though such stories do not accurately reflect what has actually been happening, they no doubt cloud the already vague knowledgability of many about postsecondary financing. It was such misperceptions about realities that helped lead to the passage of the Middle Income Student Assistance Act of 1978. Thus, the twin spectres of disorderly chronology and inadequate information stand in the way of "real world" applicability of the net price concept.

Third, Goggin (1979) argues that the net price idea, as it is usually conceptualized and researched for policy related purposes, is seriously flawed in that it does not differentiate the student from his/her family as the decision making unit. The value of college attendance as a consumer expenditure or as an investment cannot be equated across parents and their children. This problem is more a flaw of the current policy research arena than of mainstream econometric research, since economists have long realized the role of individualized and time-discounted returns on investment in purchase decisions. In an era in which growing numbers of students are claiming independent status from their parents (Minnesota Higher Education Coordinating Board, 1983) and reliance on student loans is increasing (Smith, undated), the

notion of college going decisions as a function of the family unit as a whole is analytically questionable. Yet some policy makers at various levels continue to see the prime criterion of a successful financing policy to be equalized, undiscounted net prices across family income groups.

A fourth, related point is that, even if net price does in some way drive college decision making (and it is hard to imagine it not having some role), it seems questionable to assume that parents or students make decisions using a sense of net price not differentiated by source. In other words, a loan represents something different from work study, which in turn represents something different from a grant. Rosenfeld (1980), in a review of the literature, reports that students do indeed react differently to different kinds of aid in making attendance and drop-out decisions. When a needed subsidy disappears, an alternative source of aid must be found to allow continued attendance. Thus, the effects of changes in state tuition policies toward the targeted subsidy model will depend in part on what kinds of aid are available as substitutes for the lost subsidy and how students respond to their own offered packages of those kinds of aid. For example, a significant unknown is how middle-income students will respond to an increased need for loans, as one alternative source, since loans, unlike grants, represent a claim on future income in an uncertain economic climate. Research and policy efforts not taking these subtleties into account run the risk of mis-estimating student responses to specific kinds of changes in state subsidy policies.

Fifth, people may not "process" information in the ways

posited by the targeted subsidy model. In other words, reactions to various prices and subsidies may not always be economically rational in the classic sense. Jackson (1978) reports that students may react just as strongly to the fact of receiving a grant as to the actual amount of that grant. Related research suggests that loans are not always accepted as a valued source of aid, and may in fact be culturally shunned or, among the risk-averse, feared (Astin, 1978; Rosenfeld, 1980). These reactions may occur regardless of the precise financial implications of specific loan arrangements.

Findings of this kind have clear policy implications. Recent experiences in the State of Washington suggest that, in the extreme short term (six months to one year), tuition rises prompt attendance losses out of proportion to the actual dollar effects of those rises on discretionary incomes. While such reactions tend to fade as accurate information spreads, they are of fundamental significance for governmental policy making and budget forecasting. One may hypothesize that there may very well be a "halo effect" in the financing arena, such that widely publicized cuts in federal student aid occuring simultaneously with rises in state tuition levels will create in people's minds a perception more dire than the economist or policy analyst working from the usual rationalist model and research perspective would deem warranted. The precise changes in aid dollars, tuition levels, and net prices may not be very clear to the public, but the felt tone of the changes as a whole may change behaviors in ways not predicted by the standard model. Just as the "mood" of the American public plays a big role in the profitability of the

consumer products segment of the economy, the "mood" of the prospective college student may play a big role in the fate of reforms in postsecondary pricing.

Obviously, educational research and policy making not taking into account the possible role of non-economic factors (e.g., socio-cultural values, psychological tendencies) in student decision patterns risks imprecision. Those involved in policy can benefit immensely from familiarity with the growing body of knowledge on the limits to human rationality. The seminal work in this field remains that of Herbert Simon and his many colleagues (see especially Simon, 1957), but others have made major contributions as well. The fundamental message of this research tradition has been summarized by psychologists Ward Edwards and Amos Tversky as follows: "Apparently, the most serious deficiencies in human decision making behavior arise in processing information, not in making decisions (1967, page 123)."

That message continues to be elaborated. Recently, Tversky presented new evidence to the National Academy of Sciences supporting the conclusion that "actual human behavior departs in very radical ways from rational theory," despite the fact that the principle of rational choice has long been a cornerstone of traditional economic theory (Chronicle of Higher Education , December 7, 1983). In his study of cognitive and psychophysical determinants of choice, Tversky found strong evidence that the way options are presented can produce a decidedly non-rational choice. Intelligent people may be highly averse to one option and highly favorable to another, even though they are simply restatements of the identical alternative. Specifically, Tversky found people are

more averse to loss than they are attracted to gain, and this tendency can lead them to disparate behaviors that are largely dependent on whether options are presented in terms of gains or loss. Extending these conclusions to higher education financing, one can hypothesize that cost rises (a "loss" to the consumer) may be more often publicized and more easily visible to the public than student aid rises (a "gain" to the consumer), and people's behaviors may be accordingly less rational in the economic sense. Certainly this possibility merits further research[5].

Another intriguing qualification to the notion of rational information processing derives from the realm of psychophysiology. One of the more durable concepts in that field, the notion of "just noticeable differences", dates back to the nineteenth century. Sometimes stated in mathematical form as Weber's Law, the concept is directed at specifying the point at which any of the human sensory organs (tongue, skin, ear, eye, or nose) becomes aware of a change in an external stimulus. In essence, the law states that the higher the intensity, the greater the amount of change in that stimulus necessary in order for the change to be noticed (see Woodworth and Schlosberg, 1960). In the pricing domain, the law may be translated to imply that a) a change in price of $100 will be more noticed in lower priced items than in higher priced items, and b) having many price lines confuses consumers' perceptions (Myers and Reynolds, 1967; Miller, 1962).

The relevance of Weber's Law to the world of postsecondary finance lies in our viewing various postsecondary prices and aid as stimuli. Given the rising prices and rampant noise and misinformation of the financing arena, it may very well be

impossible for students and their families to "pick up" some of the signals being sent to them by policy makers. Yet the rational model assumptions require that decision makers be infinitely sensitive to stimulus changes (see Edwards, 1954). The research has not yet seriously delved into the sensory thresholds of students as they are given financial signals, or into the variations in those thresholds across different socioeconomic classes, but it is clear that Weber's Law suggests significant qualifications to the "rational actor" assumption.

A sixth qualification to that assumption relates not so much to the public's information as to the information about the public used in policy modeling. Even when one considers only the economic factors in decision making, and even when one assumes that families are perfectly knowledgable about college prices and aid, it must be borne in mind that students and their families will not always interpret their own financial situations in ways policy analysts working with government data sets believe they do, or should. As suggested earlier, research at the national and state levels consistently suggests that the much talked about "middle-income squeeze" in college financing is more a matter of public perception than reality (see Longanecker, 1978; Hartle and Wabnick, 1983). When the changes in higher education prices are compared to the changes in the after-tax discretionary income of the middle class, there is no credible evidence that people in that class are being left out by rises in student aid for the poor. In fact, their income available for higher education may actually have grown in real terms over the past few years. Thus, it is hard for the empirically-minded policy analyst to see much

more than inexplicable, seemingly irrational attitudinal changes behind the concerns of the non-poor about tuition rises.

Yet it can be argued that those perceptions not only are conceivably "rational" under some expectations of future economic conditions, but also are the driving force behind most family behavior, not accounting-style analysis of only the highlights of family finances. What one considers rational behavior in another person is bounded by time and levels of information. By necessity, researchers and policy makers must rely on only partial accounts of family finances and choices, not the total picture as known and felt by the family . Smith (undated) reports that Minnesota high school juniors are increasingly citing financial reasons for not planning to enroll in college. One must be very cautious about such self-report data, but it would be fallacious to assume these kinds of perceptions are based in ignorance or awkward chronology alone (see the discussion under the first point above). Perceptions based in fact, like perceptions based in myth, may contribute to greater price responsiveness in attendance patterns among the non-poor than that estimated by the standard targeted subsidy model.

Seventh, the rational actor assumption, as usually activated in policy decisions, tends to disregard the differentiation among institutions and students, as well as the unique attachments and loyalties between certain kinds of institutions and certain kinds of students. Recent research by Tierney (1983), Litten et al (1980), Litten et al (1983), and Zemsky and Oedel (1983) on the preferred institutional "choice sets" of students suggests, at least indirectly, that there are "sticky" and "fluid" parts of the

college attendance market. In other words, some parts of the market may be marked by fairly inelastic demand (prices do not much matter), whereas others may show highly elastic demand (prices matter a good deal). Subsidy policies designed without attention to these irregularities in the market (e.g., policies considering only family income as a factor in forecasting price elasticity of attendance responses) may be destined for surprise endings.

The Ceteris Paribus Assumption : Assuming ceteris paribus (i.e., all else remains equal) is a convenient convention in forecasting the impacts of various public policy options, but it may not accurately reflect reality. The world cannot be assumed to stand still for long. "All else" is not usually equal, or stable. One true test of any policy is how well it can stand up to the unpredictables that can act to thwart its intents. There are several "wild cards" that can threaten the success of the targeted subsidy approach to funding postsecondary education.

The first involves the possible effects of future economic developments. A significant set of questions may be raised as to whether the returns to a college education will remain stable over the next few years or rise or fall. If the income gains to be had from college attendance are indeed on a downslope, there is no reason to believe the price responsiveness of different groups will remain the same. College is not simply a consumer expenditure on the order of a car or a stereo set. Although it certainly has those aspects to it, it is also an investment decision akin to deciding on a stock market purchase. Its price is thus weighed not only against the current assets available to pay for it but also

against its likely income returns after graduation. When external factors affect the demand for education, enrollments will be affected regardless of cost. The issue then becomes one of determining the appropriate public commitment to postsecondary education is such an environment. Should general liberal arts education be abandoned in public institutions if consumer demand shifts heavily to vocationally oriented programs? Is the logical extension of the targeted subsidy approach not only to differentiate tuition levels by the cost of providing programs but also by the likely economic returns to the participants? If greater emphasis is placed on vocationalism in education, what is the appropriate division of support for such education between public and private sources? And if participation in public postsecondary education declines significantly, how do we preserve educational quality--do we close schools, appropriate more funds, or allow the education to erode into mediocrity?

A second set of "wild cards" in the deck affecting enrollments in a state involves future governmental policy changes. It is well-known that individual states and institutions can do much to effectively neutralize federal policy initiatives in the student financing arena (American Council on Education, 1978). One way this has been accomplished in the past is for a state to raise public tuition levels by amounts roughly in line with new increases in federal grant programs for students. The effect of that is to engineer a transfer of federal funds to the state; the new funds may pass through student hands but do not necessarily accrue to the benefit of those students. The flip side, of course, is the ability of the federal government to

support or undercut state policies. How the two governmental sides mutually adjust to each other's actions will play a big role in the actual prices faced by students. In turn, these developments can affect the attendance decisions made by students[7].

A third set of wild cards affecting state enrollment forecasts involves changes in the supply of postsecondary education. In many states, it is not too difficult to construct a scenario for the next decade in which the demographically induced declines in enrollment, along with pressures on enrollment rates fed by student doubts about the value of postsecondary education, force institutional closings in both the public and private sectors. These demand-induced changes in the supply of postsecondary education would in turn have effects on prices paid by students for their educations. In the end, these price changes would presumably have effects on enrollment patterns[8].

Within such a public policy environment, what public policy options are available? Do states close institutions to achieve efficiencies, but in so doing potentially jeopardize access for some students? Or do they attempt to maintain constant offerings, depite smaller numbers of students? Neither alternative appears very attractive. Either more money will be needed to educate each student or the level of educational services will have to decline. To garner additional money requires either increased public appropriations, which seems unlikely given current fiscal constraints on the public purse, or increased tuitions, even beyond those argued for under the targeted subsidy approach, which would result in net increases in costs for all students and thus undermine the goal of equal opportunity. Without additional

resources, however, essential levels of educational services cannot be maintained, let alone enhanced, and public education will sink into mediocrity. In summary, regardless of what strategy (targeted or traditional) is used for funding postsecondary education, a declining market for this service may have an impact on the overall level of service provided. The choice of the putatively more cost-effective targeted approach does not immunize states from the dangers of exogenous market influences.

Fourth, the nature of information available to students and their families is not constant. The earlier critique of the rational actor assumption stressed that misinformation, misprocessing of information, and lack of information are features of students' college decision making. Given those facts, exogenous changes in flows of information to students can have major effects. Knowledgability may have changed appreciably since earlier studies estimated price responsiveness coefficients. At the urging of a number of analysts (see especially Astin, 1978; Jackson, 1978), the federal government and many states have made concerted efforts in the last few years to make improvements in information materials regarding prices and aid (see Packer, 1980). Conceivably, the injection of extra information regarding college prices and aid could raise or lower price responsiveness profiles significantly. All research is bound partially by its time and place, and price-responsiveness research is no exception. Consumer information about college net prices may be viewed as a set of continua, each continuum corresponding to knowledgability about a certain category (e.g., student loans, Pell Grants, etc.). Movements along the continua are critical determinants to

responses to public policies, yet these movements are often unknown to state policy makers and out of their control.

The Efficient Delivery Assumption : It is generally assumed that the targeted subsidy approach relying more on student aid than on tuition subsidies will more efficiently direct scarce resources. Nevertheless, there are at least three factors which may work to counteract the projected efficiencies. First, there is worry over whether the targeted subsidy approach may be an especially precarious means for assuring aid to the most needy students. Pechman (1970, page 369) has argued that "grant-loan systems, combined with full-cost tuition fees, may appear to be more 'efficient' in principle," but may in fact jeopardize their primary goal of equity because they may prove to be more subject to political machinations than the simpler low-tuition systems. After all, aid costs represent a relatively clearcut line item for legislators debating a state budget, whereas tuition subsidies are a less politically visible (more indirect) aspect of state budgeting deliberations. What is more, from the standpoint of the public, the visibility picture is reversed: it is the low tuition that is more known and often best supported. Thus, aid may be the more debatable expenditure from both the public's and politicians' perspectives.

Second, there is also some question about how effectively student assistance programs can be managed. Economies of scale clearly should make it very cost-effective to operate large state-wide financial aid systems, and a centralized delivery system may be essential to preserve the integrity of this funding approach. Yet research for the U.S. Department of Education

(Advanced Technology, Inc., 1982) suggests that, at least at the federal level, the prevention of errors in student aid delivery (e.g.,incorrect income reports, institutional errors in awards, etc.) is a monumentally difficult and expensive task. More inefficiencies can result from the fact that the knowledgability of students and their parents about the forms and terms of aid is sadly inadequate, as discussed earlier. Without knowledgable consumers and efficient processing, the vaunted merits of targeting may be severely tested.

Third, the data and technology policy makers use to predict the impact of price changes on attendance patterns may not be well enough specified and developed to apply precisely to all policy situations that might arise. Our data, for example, are often based in historical behaviors taking place within a limited context of past price ranges, price sets, and price changes. Our models generally assume a linear relationship between price and attendance. Yet is it reasonable to assume that the first dollar change would have the same impact as the last dollar of change? We know that each person has a threshold, beyond which his or her behavior will be affected, but what is that threshold? And we know that the most likely response to price changes, if there is one, is to change one's choice as to where to attend, not to change one's choice as to whether to attend (e.g., see Tierney, 1983; Hearn, 1980; Jackson, 1978), but at what point do such decisions to shift to lower cost institutions occur?

Implications

The empirical results reviewed here support the view of many

policymakers and econometricians that tuition rises serve to enhance rather than diminish equity when accompanied by offsetting rises in need-based financial aid. We label as myth, therefore, the view that such rises *per se* threaten equality of educational opportunity. On the basis of what we know from existing research, there is strong factual basis to believe that responsible movement toward a targeted subsidization financing scheme for postsecondary education should not appreciably affect enrollment rates, in the long run.

Several impacts of a lower order of magnitude will often be felt, however. Price changes of the magnitude and type usually planned by states are not powerful enough to change the minds of many students regarding the access question, i.e., whether or not to seek postsecondary education (for supportive evidence, see Jackson, 1978; McPherson, 1978). It is unlikely that many students who planned to attend will be deterred. It is nonetheless more likely that some redistribution of enrollments will occur. Logically, some students attending higher cost public institutions might choose to attend lower cost schools because of the increased tuition differential, and likewise some students attending public institutions might choose to attend higher cost private institutions because of the decreased tuition differential. Finally, any precipitous move towards targeted subsidy approach will almost certainly result in a short-term impact due to misleading public perceptions resulting from a lack of full understanding and information. Articles in the popular press about families struggling to cope with the changes feed the misperceptions of the lay community. Such unfortunate impacts

should fade perceptively after the public becomes more knowledgable and accustomed to the changes".

These conclusions are based on what we know, however. They do not address the many elements we do not know. The concerns of many that there are too many unknowns, and that our guiding assumptions may prove to be false, suggest that efforts to move towards a targeted subsidization financing scheme must be monitored closely. Great caution should be exercised in utilizing policy research based strongly in assumptions of consistently rational human behavior; stable markets, expectations, and policies; and fluid movement of funds, people, and information. The extent to which the concerns over those matters are significant depends on the specific policy or research situation encountered. At the very least, the public debate over these issues should be informed by knowledge of both the uses of existing research findings and the limitations of those findings.

Some rather urgent questions demand further research. Many of these questions relate to one little-understood domain: the social psychology of people's reactions to price changes in postsecondary education. To the extent people perceive the current and future financing scene, and their own current and future financial situation, in ways distinct from the expectations of the standard policy model, they will behave differently from the model's expectations. The greatest research imperative in the postsecondary financing arena thus relates to the ways people process information. The world of perceptions and knowledgability in postsecondary finance is as yet little explored by researchers. Standard models do not always predict behaviors well, and the need

to find additional explanatory factors is clear. Some analysts are already conducting intriguing research on this domain, using longitudinal data from the national High School and Beyond Survey funded by the U.S. Department of Education (see Olson and Rosenfeld, 1984). At the state level, the changes in postsecondary financing currently being instituted in California, Minnesota, Washington, and several other states will provide valuable laboratories to explore new understandings of postsecondary enrollment patterns.

How much does the public know about true postsecondary prices? How is this knowledge used? How do individuals in different income groups weigh their own ability to pay? Is there strong student willingness to undertake debt as a substitute for a tuition subsidy? How high can a state raise tuition without changing the attendance patterns of the nonpoor, and possibly creating a drain into the private sector? Finding at least tentative answers to questions of these kinds could make educational policy making far more informed and straightforward in the forthcoming years.

FOOTNOTES

1. See, for example, Hansen and Weisbrod, 1969; Windham, 1976, 1980. It should be noted that the presentation of the arguments of these economists, and the state policy perspective in general, is in some respects simplified here. Limitations of space, and no doubt reader patience, prevent a recounting of the many subtleties and technicalities involved.

2. This argument has been quantitatively defended by analysis of state tax revenue sources and outlays broken down by different income groups. State taxes across the country tend to the regressive side, so while the poor are attending higher education at lower rates than other segments of the population (see Peng et al, 1977; Heyns and O'Meara,1982), they may be paying for the states' postsecondary expenditures at rates equal to or greater than those segments (Hansen and Weisbrod, 1969; Windham, 1980). Thus the poor's taxes may be going to pay for the rich's attendance. These kinds of findings have been hotly disputed, however, and the tax-flow equity debate is far from closed (see Pechman,1970, 1972; Nelson, 1978).

3. The series of studies conducted to examine the effects of price changes on college attendance differ considerably in focus, methodology, and rigor. Two of the most methodologically sophisticated studies are Radner and Miller's Demand and Supply in U.S. Higher Education , a 1974 study for the Carnegie Commission on Higher Education, and Kohn, Manski, and Mundel's Empirical

Investigation of Factors Which Influence College-Going Behavior, a 1974 Rand Corporation study. The results of these studies and others are summarized in three sources: Jackson and Weathersby (1975), McPherson (1978), and Rosenfeld and Hearn (1982).

4. Both costs and benefits are calculated in present-value terms in the more sophisticated analyses.

5. For some parallel comments by an economist, see the conclusions of Albert O. Hirschman, as reported in the Chronicle of Higher Education (January 13, 1984): "As economics has grown more ambitious, it becomes of increasing importance to appreciate that the means-end, cost-benefit model is far from covering all aspects of human activity and experience."

6. See Freeman (1976). Also see Rumberger (1980) for a critique of this view.

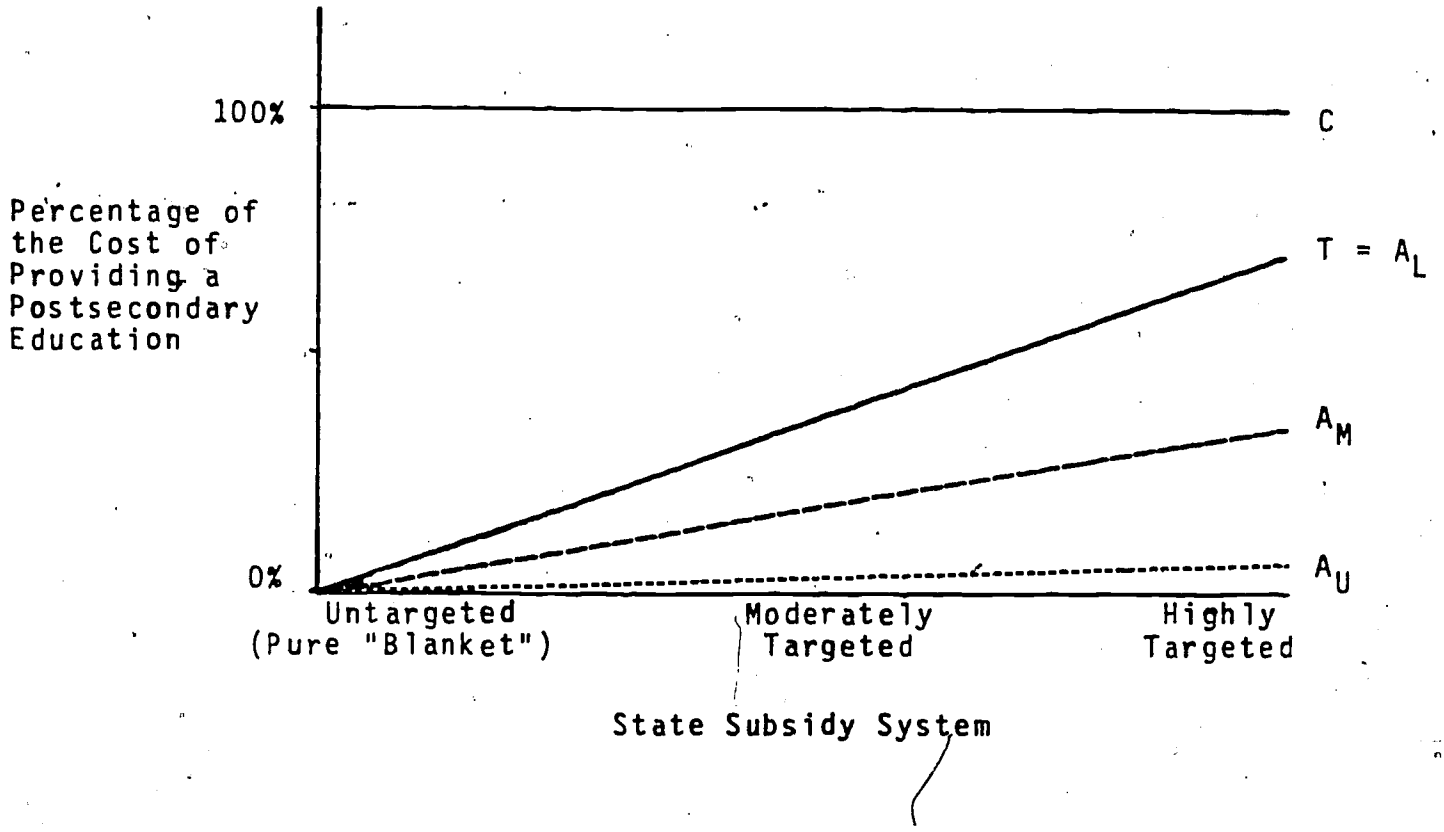
7. Gillespie and Carlson's (1983) summary of recent federal student aid funding patterns and the conclusions of Smith (undated), Gladieux (1983), and others regarding the likely funding patterns in the near future suggests continuing pressure on students' ability to finance postsecondary attendance. The recent resurgence of federal interest in education matters, however, may counter that conclusion somewhat.

8. For an intriguing desciption of this and other possible scenarios for higher education in the 1980's, see Heydinger and

Zentner (1983).

9. For the state of Minnesota, supportive (albeit early) evidence regarding these expectations may be found in the analyses of institutional researchers at the University of Minnesota (see University of Minnesota Report , January 1984).

FIGURE 1: STATE SUBSIDIES FOR POSTSECONDARY STUDENTS--BLANKET VERSUS TARGETED SYSTEMS

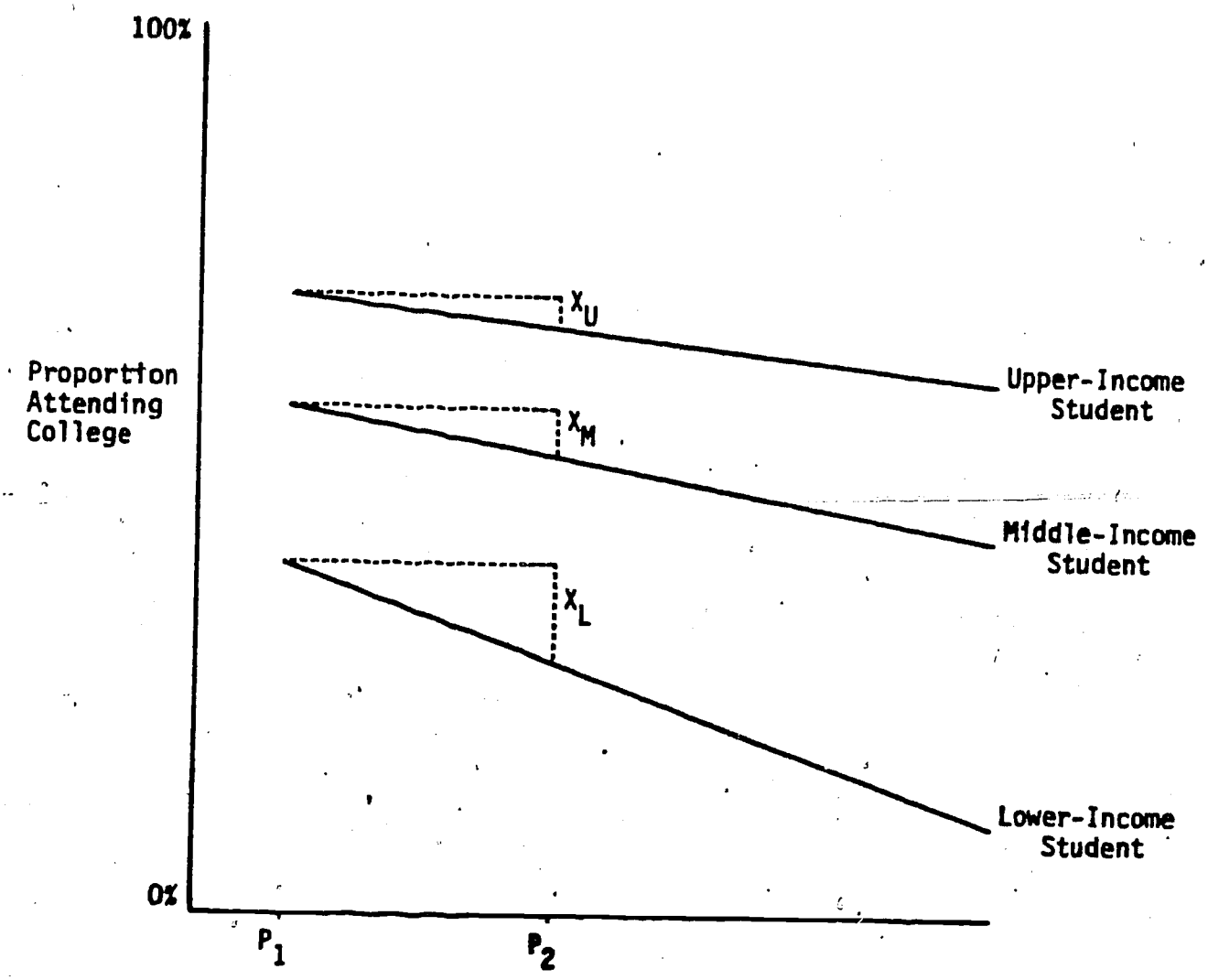


KEY:

C = The Cost of Providing a Postsecondary Education
T = Tuition and Fees
A_L = Financial Aid for a Lower-Income Student
A_M = Financial Aid for a Middle-Income Student
A_U = Financial Aid for an Upper-Income Student

NOTE: Hypothetical scenario.

FIGURE 2: A SIMPLIFIED MODEL OF POSTSECONDARY ATTENDANCE PATTERNS IN DIFFERENT INCOME GROUPS



NOTE: This simplified exhibit assumes: (a) students in all income levels to be high school graduates with equivalent aspirations, abilities, and preparation, and (b) only one pricing scheme.

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