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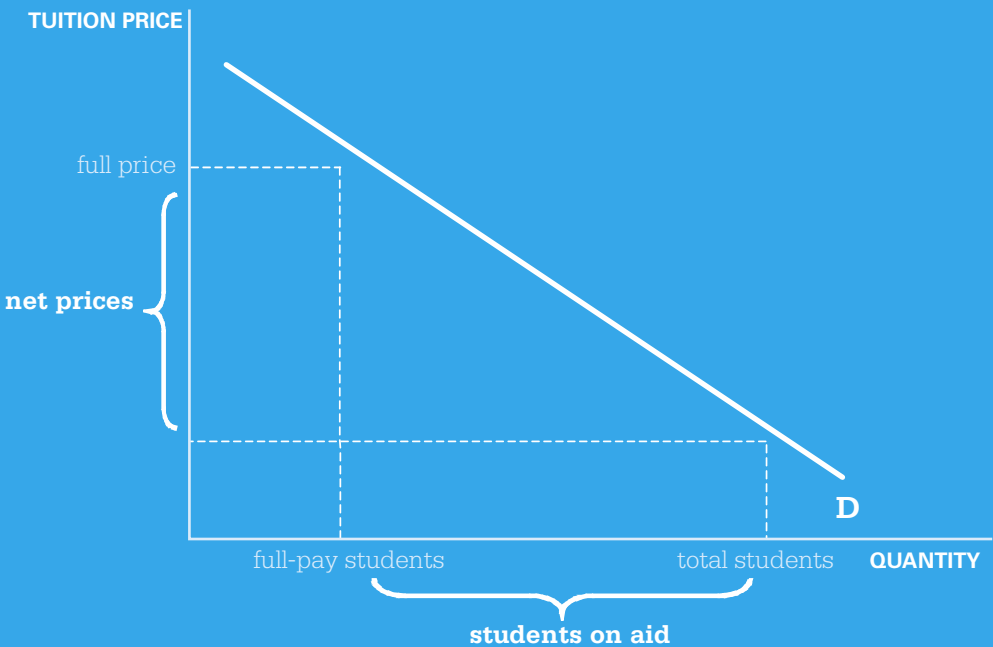
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# A Primer on Economics for Financial Aid Professionals

Sandy Baum





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College Entrance Examination Board  
New York, 2004

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# Introduction

The fiftieth anniversary of the College Scholarship Service® (CSS®) is an appropriate time to issue the revised edition of *A Primer on Economics for Financial Aid Professionals*. Originally published jointly in 1996 by the College Board and the National Association of Student Financial Aid Administrators (NASFAA), the *Primer* is intended to help familiarize those new to financial aid with the fundamental concepts underlying the system and to enrich the understanding and critical perspectives of more seasoned professionals. These same goals have motivated much of the work of CSS over the last half-century. For 50 years, the College Scholarship Service of the College Board has been devoted to improving the need analysis system underlying aid allocation and to supporting financial aid professionals as they endeavor to help students and families meet the challenge of financing a college education.

The price of college, affordability, and the financial aid system are increasingly in the public eye as students and families struggle

with rising tuition levels. In today's environment, need-based aid frequently competes for dollars with grants awarded on the basis of academic quality and other factors, and measures of need are too often manipulated in the interest of other institutional goals. These circumstances make it more and more important that financial aid professionals be in a position to make reasoned and informed decisions about the allocation of student aid dollars and to explain and support their methods.

This *Primer* approaches financial aid from a perspective that is too often ignored. Written by an economist who has studied financial aid in depth, it asks aid professionals to think more broadly than they otherwise might about both the logic underlying the allocation of student aid and the potential impact of the aid system on the behavior of students and families. Although the financial aid profession has long recognized that sound economic principles should underlie aid allocation formulas, many aid professionals are unfamiliar with and/or intimidated by basic economics. This *Primer* is an attempt to make economic concepts and their potential application to need analysis more accessible to financial aid professionals.

While too many people working in aid offices don't have adequate time to provide an in-depth answer to the question of the appropriate amount of funding for a particular student, for many others, professional judgment about individual cases is a major part of the job. In addition, as individual institutions search for creative ways to make their limited aid dollars go further, both in terms of providing educational opportunity and in terms of enrollment management goals, financial aid professionals will become increasingly involved in an individualized process of allocating aid funds. An understanding of the underlying economic principles will inform and facilitate this process.

The *Primer* links economic theory to need analysis in two distinct ways. Part I presents basic economic concepts and discusses their application to college enrollment and student aid. The concepts included have particular significance for understanding either college pricing systems or the ability and/or

willingness to pay for higher education. For example, everyone reading this *Primer* is aware that on campuses around the country, there is ongoing debate about whether net price differentials should be based on ability to pay (need), on merit, or on willingness to pay. What is less familiar to many people engaged in this debate is the standard economic concept of price discrimination. Higher education is not unique in selling the same product to different consumers at different prices. An understanding of the conditions required for price discrimination (the technical name for this practice) and of the implications of this pricing policy in general, can provide useful background for higher education professionals grappling with college pricing and financial aid policy decisions, and strengthen the arguments of those committed to the equitable and efficient allocation of student aid.

Some more general economic concepts can also provide a valuable framework for analyzing financial aid. The concept of opportunity cost, for example, is one that even students who are not drawn into the economic mode of reasoning find staying with them as a useful way of thinking about daily life. Opportunity cost refers to the idea that any choice we make involves a sacrifice, a foregone opportunity. The cost of attending college is not just the tuition, but also includes the wages foregone by students who choose to postpone entry into the labor market. Ignoring this part of the cost of higher education significantly distorts both our understanding of costs and our ability to advise students responsibly about their choices.

Part II of the *Primer* analyzes specific components of the need analysis system from an economic perspective, examining both the underlying assumptions of the system and some specific components of Federal Methodology (FM) and the College Board's Institutional Methodology (IM). Federal Methodology, legislated by Congress during the 1992 Reauthorization of the Higher Education Act, is the mandated allocation formula for federal student aid. It represents the second iteration of the congressional attempt to legislate a need analysis system, the Congressional Methodology (CM) having been in effect from 1988 through 1992. Before 1988, colleges and universities were

allowed to distribute aid based on the methodology of their choice, commonly the Uniform Methodology (UM) developed by the member institutions of the College Board and American College Testing (ACT), in cooperation with the U.S. Department of Education, emerging through the Keppel Task Force and maintained by the National Coalition for Coordination of Student Financial Aid. FM still contains many of the details that were part of UM, but has evolved into a complex but imprecise system for allocating funds, rather than a reliable index of financial capacity. For example, FM does not consider assets for most families with incomes below \$50,000 and ignores both home equity and family farm values for all aid applicants.

Institutions are obligated to rely on FM to distribute federal funds. But colleges and universities that have significant institutional funds to distribute seek more reliable measures to rank families and students by levels of financial strength. For those institutions, the College Board's Institutional Methodology (IM) and modifications of that formula are most prevalent. This methodology resembles the earlier UM and CM, considering home equity, family farms, and other assets for all families and incorporating a minimum contribution for all students. It has been modified in a variety of ways in recent years, as CSS has sought to update and improve the system.

Although the second part of this *Primer* analyzes a number of specific components of both FM and IM, instead of going through any particular formula step by step, the discussion focuses on the requisite framework for any need analysis system. That is, income and assets must be defined, then the methodology must determine which components of income and assets should be assessed to determine expected contributions, as well as what the appropriate assessment rates are. In addition to addressing general principles of need analysis methodology, the discussion calls attention to ways in which FM and IM differ from each other, to widely recognized shortcomings in the standard formulas, and to some of the proposals currently being discussed within the aid profession that might improve the need analysis system.

Readers of this *Primer* may find it useful to keep some basic principles of public policy analysis in mind. Economists tend

to evaluate public policy in terms of the two criteria of equity and efficiency. The question of whether or not a policy is fair is obviously subjective, but an understanding of who is helped and who is hurt is fundamental to making such a judgment. Determining whether policies make the most productive possible use of limited resources is also complicated but can be facilitated by a thorough understanding of some basic economic ideas.

At times there is a trade-off between equity and efficiency, but the two may also be complementary. Even in the case of need analysis, primarily designed for reasons of equity, paying attention to the incentive effects, the behavioral responses, and the impact of a policy on market outcomes is vital. In rough terms, if we waste a lot of money trying to help people in ways that end up being counterproductive, we will find ourselves with lower levels of overall resources, unable to attain our most basic goals. If the need analysis system punishes people for certain choices or behaviors—such as saving—those behaviors will be discouraged and we will end up with fewer dollars to distribute to those most in need. If we use limited resources to influence institutional choice among students who would attend college—or enroll in a similar institution—regardless of subsidies, we will have insufficient funds to increase college access and enrollment. In other words, the efficiency aspects of the need analysis system cannot be ignored.

Both the equity and the efficiency of the aid system are diminished by its complexity. Students who do not understand the system and have no way of predicting what aid will be available to them may fail to apply for aid—or fail to apply to college at all. This reality clearly reduces the effectiveness of the aid system in removing financial barriers to college access.

This *Primer* will not answer all the questions of its readers, nor will it reveal the secret to the perfect need analysis system. But it should help its readers to develop new perspectives and to gain more insight into how the need analysis system works and ways to improve it.



# Part I:

# Basic Economic Concepts

Economic theory is designed to elucidate the workings of markets and the allocation of scarce resources in society. Pricing, demand, and distributional issues, all fundamental to understanding college financing, are central to economic analysis. Below, a set of economic concepts with particular applicability to college enrollment and financial aid are defined and explained. In each instance, a general explanation is supplemented by a discussion of the particular relevance of the concept for understanding paying for college.

Horizontal and vertical equity may be the most important economic concepts in this context. Equity is the primary motivation for need analysis, and a clear framework for defining this frequently elusive concept is a good starting point for understanding the relationship between economic analysis and financial aid.

# Horizontal and Vertical Equity

There are some objective ways of looking at the complex and subjective idea of fairness.

Economists divide the concept of equity or fairness into two basic categories. *Horizontal equity* refers to the equal treatment of people in similar circumstances, while *vertical equity* involves treating people in different circumstances in appropriately different ways. All public expenditures and taxation policies can be examined both from the perspective of efficiency and from the perspectives of horizontal and vertical equity. These concepts are, of course, to a considerable degree, subjective; there is no definitive way to measure the equity of any particular policy.

The personal income tax provides a good example for examining the complexity of horizontal and vertical equity. Horizontal equity requires that people with equal incomes should pay equal amounts of tax. But the reality of designing an equitable policy is not so simple. Should *individuals* with equal incomes pay equal taxes, or should *households* with equal incomes pay equal taxes? Is a couple in which the husband earns \$60,000 a year and the wife works in the home in the same situation as a couple in which each spouse earns \$30,000 a year? The need analysis system faces similar complications relating to horizontal equity. It is easy to say that two families in similar circumstances should be judged to have the same ability to pay. But judging

equal circumstances is not always straightforward. For example, families with two children are assessed very different expected family contributions, depending on the spacing of their children. Those with twins may be expected to contribute only about half as much to their children's education as families with similar incomes and assets who have children four years apart. This is a *horizontal inequity*.

One of the most common horizontal equity quandaries in designing a need analysis system is determining whether or not families with similar incomes who have, for a variety of reasons, made different choices, should be treated similarly. If two families have equal incomes, but one has chosen to save while the other has chosen to consume more, should they have equal expected family contributions because they had equal financial opportunities, or should the family with savings pay more because their accumulated savings increase their capacity to pay?

*Vertical equity* is even harder to identify than horizontal equity because there is considerable room for disagreement on defining the types of differences in circumstances that should correspond to different treatments and because there is not one right answer to how different the treatments should be. We have a progressive federal income tax, under which those with higher incomes pay a higher percentage of their income in tax than do those with lower incomes, because there is a general sense that this constitutes appropriately different treatment of people in different circumstances. But extensive efforts by many great minds have been unable to produce a *proof* that a progressive tax is fair, much less any objective standard for the optimal degree of progressivity.

The need analysis system, like the federal income tax, uses a graduated rate structure, combined with the exemption of some amount of income, in order to create a progressive tax system. There is no way to determine, however, whether the existing rate structure is more vertically equitable than any alternative rate structure would be. This is a judgment on which reasonable people will always differ.

Despite the difficulty of ranking specific policies and practices

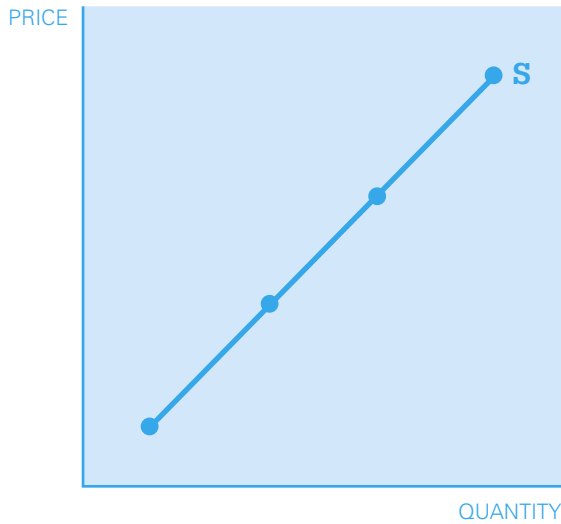
in terms of horizontal and vertical equity, these concepts provide very useful benchmarks for designing and evaluating policies. The fact that we are likely to disagree on optimal strategies does not negate the fact that a good need analysis system will be designed, as far as possible, to assess equal contributions from families and students in similar circumstances and appropriately higher contributions for those with greater financial capacity.

# Supply

What is the relationship between the number of students a college wishes to enroll and the tuition it can charge?

Supply and demand are the basic building blocks of economic theory. Many people have a general sense that increased demand is likely to raise prices and that surpluses may be caused by increased supply. But a more precise understanding of these fundamental concepts is key to working with them and to comprehending complex economic situations.

Figure 1 shows a graph that relates the price of a seller's product to the quantity of the product the seller is willing to supply over a given period of time. The *upward sloping* curve suggests that as the price sellers can command for their products increases, they are willing to supply larger quantities. Supply curves are frequently assumed to look this way, at least in the short run, because of the capacity constraints created by any given level of plant and equipment.



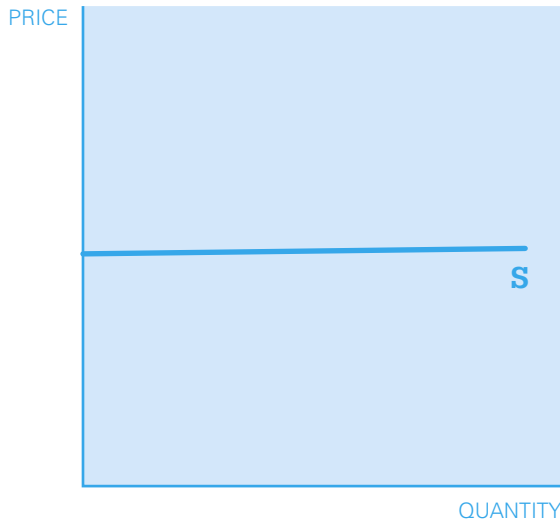
**Figure 1: Upward Sloping Supply.** Price is measured on the vertical axis and quantity is measured on the horizontal axis. An upward sloping supply curve indicates that in any given period of time, assuming costs of production are constant, a supplier is willing to supply larger quantities when the selling price of the product is higher.

The cost of producing additional units of output tends to increase as output levels increase. The supplier may hire more workers to produce more, but these workers have limited space and a limited amount of equipment with which to work, so they can't contribute as much as workers added earlier. Only rising output prices can make it profit-maximizing to incur these costs. Suppliers may also be willing to produce larger quantities at higher prices, as suggested by an upward sloping supply curve, because as the price rises, alternative uses of resources become relatively less appealing.

If colleges have upward sloping supply curves, it means they will seek to increase the size of their student bodies only if the tuition they can charge increases. However, there are a variety of reasons why some colleges might be willing to increase the size of their student bodies without raising their prices. As is the case for any supplier, the cost conditions at any particular institution will determine the shape of its supply curve.

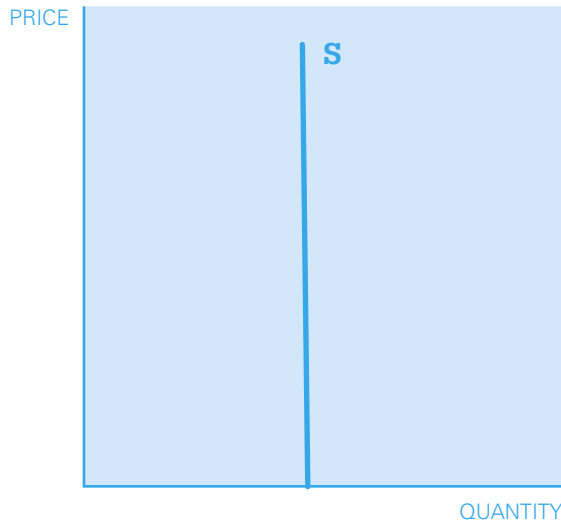
The supply curve may be *horizontal* over some range, as

illustrated in Figure 2. This is the supply curve for a college that is willing to enroll a significantly higher number of students without raising its price. This would be true if the cost of educating additional students is relatively low and essentially constant, as it would be for schools with excess capacity.



**Figure 2: Horizontal Supply.** A horizontal supply curve indicates that the supplier is willing to supply larger quantities of output without raising the price of the product. This would be the case if additional units of output can be produced at the same incremental cost as that generated by earlier units.

On the other hand, if they are operating at capacity, colleges may not be able to increase the number of spaces supplied without undertaking considerable capital investment. It might be necessary to build new classrooms or residence halls, for example. This would create a *vertical* supply curve, as illustrated in Figure 3, at least in the short run. Increasing tuition levels would not elicit increased quantity supplied, given the existing plant size.



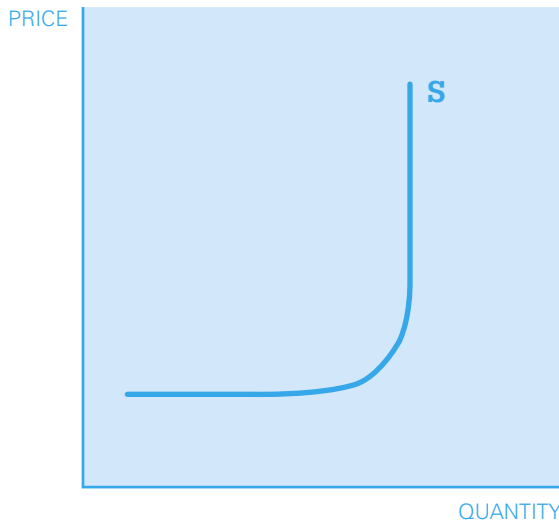
**Figure 3: Vertical Supply.** A vertical supply curve indicates that the supplier will not increase the quantity of output, regardless of how much the price rises. This would be the case if there are severe capacity constraints.

An additional complication is the reality that colleges and universities are not profit-maximizing enterprises. Even if more students would generate additional revenues without significantly increasing costs, institutions may determine that increasing the size of the student body would require lowering admissions standards and thus diminishing the quality of their product. In this case, they may arbitrarily create a vertical supply curve, placing a limit on the quantity of places they are willing to supply, regardless of how much potential students are willing to pay and of the short-run cost of accommodating them.

Institutions in different situations will find themselves with dramatically different supply curves. A small number of colleges and universities in this country have more qualified applicants willing to pay the full price than they can reasonably accommodate. They have vertical supply curves. In contrast, an increasing number of institutions are having considerable difficulty attracting enough students with enough ability to pay to operate anywhere near capacity. For these schools, the supply curve is probably close to horizontal. If people with the requisite funds were to appear, the

schools would expand their enrollments without raising prices. Normally, only as they approach capacity would they find the incremental costs of additional students increasing and their supply curves becoming steeper.

Figure 4 shows a supply curve that is horizontal when the college is operating far below capacity and gradually becomes vertical as it reaches capacity, or as its costs of educating additional students rise for some other reason.



**Figure 4: Curved Supply.** This supply curve is horizontal at low levels of output but becomes steeper as capacity is approached.

Some of the unique characteristics of education may cause institutions to find that as they enroll more students, incremental costs rise even though there are no capacity constraints. This might occur because of the variation in the characteristics of the students. Unlike other products, education is not something customers can purchase and take away, with the producer's involvement ending once payment is made. The characteristics of the students can significantly affect the resources required for the institutions to provide an adequate education. If colleges fill their beds by accepting students with limited academic preparation, with severe learning disabilities, or with other characteristics that make it more

difficult for them to succeed, the incremental cost of educating these students will be higher, and tuition may have to increase to cover these costs. The interdependency of student quality and cost of education may create an upward sloping supply curve, reflecting the higher costs of serving additional students, even when there is considerable excess capacity.

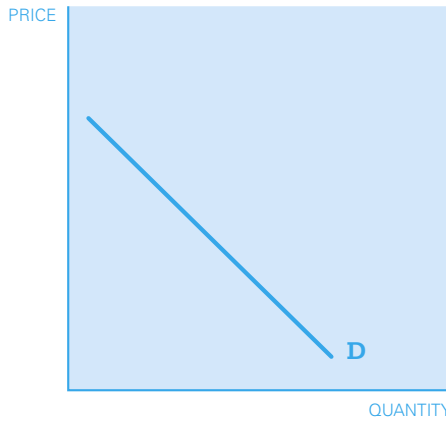
# Demand

## What factors affect the number of people willing and able to enroll in a college?

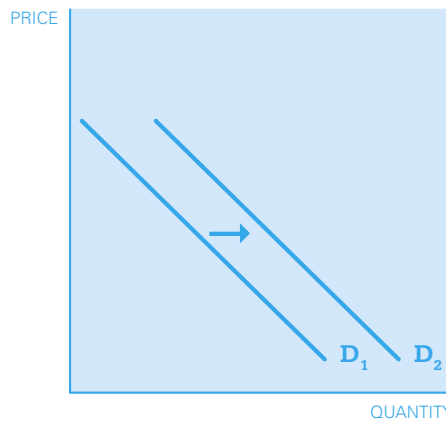
A basic rule of economics is that the quantity of goods and services people choose to buy depends on prices. When apples are expensive, people may choose to buy fewer apples and more oranges. As the price of apples falls, more people will pay attention to the maxim that an apple a day keeps the doctor away.

There are downward sloping *demand curves* for most goods and services, including higher education. That is, as the price increases, quantity demanded decreases. As prices go up, some people decide going to college is not worth it after all. Although many students are willing to pay higher prices for institutions they perceive as providing higher quality education, low-cost institutions attract other students, who would never consider paying the prices charged by expensive private colleges. The slope of the demand curve reveals how much the quantity demanded changes when the price changes.

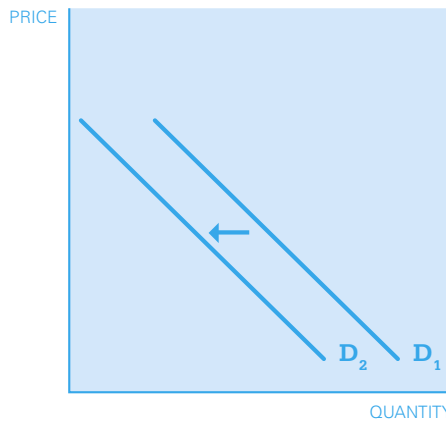
When a demand curve relating price and quantity is drawn, many factors have to be assumed to remain constant. These include the size of the population, consumers' preferences, income levels, the distribution of income, and the prices of goods and services that might be substitutes or complements (goods that are consumed together with the good in question). If any of these factors change, the whole demand curve will move, as shown in Figures 5a, b, and c.



**Figure 5a: Demand.** This is a downward sloping demand curve, indicating that as the price of the product falls, the quantity demanded over any given period of time increases.



**Figure 5b: Increase in Demand.** This curve shows an outward shift of the demand curve. This increase in demand might occur as the result of increased incomes or an increase in the priority consumers place on the product.



**Figure 5c: Decrease in Demand.** At any possible price, consumers are willing to purchase less than they were before. Declining incomes or the increased availability of substitutes might cause this decrease in demand.

For example, an increase in the population of recent high school graduates in the Northeast will increase the number of people interested in attending Skidmore College (a private liberal arts college in upstate New York) at any possible price. If general skepticism about the value of a liberal arts education increases, the opposite will occur—the demand curve will shift in. In a recession, when incomes are generally lower, fewer people will be able to pay the price. This will also be the case if inequality in the distribution of income increases. If incomes become much more concentrated at the top, while a small minority can easily pay for a private college education, it is out of reach for a greater and greater proportion of high school graduates unless financial aid increases enough to compensate for declining incomes.

The effects of substitutes and complements can be seen by looking at public college tuition levels. If Skidmore's price remains constant, but tuition at the State University of New York increases, the demand for a Skidmore education is likely to increase. More people will be willing to pay Skidmore's price, not because they are responding to changes in Skidmore's price or because their preferences have changed, but because the price of a close substitute—a reasonable alternative to Skidmore—has increased. When complementary goods become more expensive, on the other hand, the demand for a Skidmore education will decline. If, for example, students from other parts of the country are affected by a dramatic increase in airfares, Skidmore's demand curve may shift in.

It is important to note that demand is a function both of people's preferences and of the amount of money they have available. In other words, both *willingness* and *ability* to pay matter. Standard economic discussions of demand tend to focus on willingness to pay. People are willing to pay higher prices for the first pizza they buy each week, when they crave pizza, than for the tenth, when they are getting bored by eating too much of the same thing. In the jargon of economic analysis, the marginal utility of pizza declines as the consumer has more and more of it in a given time period. The amount of satisfaction delivered by the first pizza

is greater than the amount of satisfaction delivered by the tenth, and it is this added satisfaction that determines willingness to pay.

However, the demand curve doesn't just measure how much people "want" something. It measures effective demand, or demand backed up by dollars. A classic example is the comparison of the amount a poor man is willing to pay for milk for his baby to the amount a wealthy man is willing to pay for milk for his cat. Does the wealthy man care more about his cat than the poor man cares about his baby? Common sense tells us that the difference is not in how much these two people want or need the milk; the poor man is simply unable to come up with the cash to pay for it.

The lesson here is that the demand curve necessarily represents willingness to pay combined with ability to pay. The fact that demand is satisfied, that the market is in equilibrium with everyone willing to pay the price getting the quantity of milk they demand, does not mean that everyone has what they need, that everyone is happy, or that society should feel comfortable with the outcome.

Financial aid professionals are increasingly aware of the distinction between ability to pay and willingness to pay. The whole need analysis system is designed to ameliorate the problem illustrated by the milk example. The concept of need-based aid rests on the premise that people interested in attending college and able to benefit from the opportunity should have access, regardless of their ability to pay. Need-based financial aid constitutes an attempt to shift the demand curve out by increasing the resources available to people to pay for college. (Another way of looking at the phenomenon is in terms of net price. Financial aid lowers the effective price, and at lower prices, more people are able to pay.)

Recently, people with sufficient resources to pay for college have become more resistant to paying. They are demanding financial aid in order to keep them from choosing less expensive alternatives. In other words, willingness to pay has come to the fore as an issue in the demand for higher education. Changing priorities and a declining willingness to sacrifice consumption

of other goods and services are shifting the demand curve in. Because of this phenomenon, financial aid is increasingly being used to supplement the resources of those who are able but *unwilling* to pay, rather than subsidizing those who otherwise could not *afford* college.

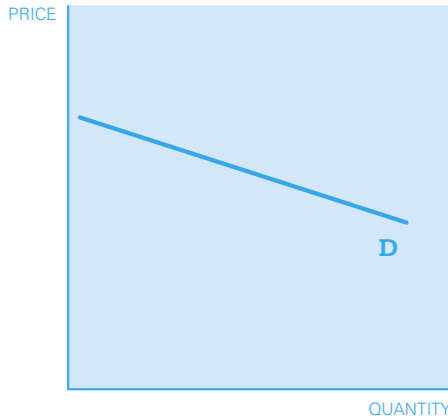
It is clear that a family with no assets whose annual income is less than the level of tuition cannot afford to pay for college, but in most cases “affordability” is much more subjective. How much any aid applicant can afford clearly depends on values, priorities, and willingness to sacrifice other goods and services. This means that the line between ability to pay and willingness to pay is a blurry one. While a need analysis system can attempt to measure ability to pay based on financial capacity, the demand for education will always be based on a combination of ability and willingness to pay, and the adequacy of financial aid funding levels and allocation formulas will depend on both of these aspects of demand.

# Price Sensitivity

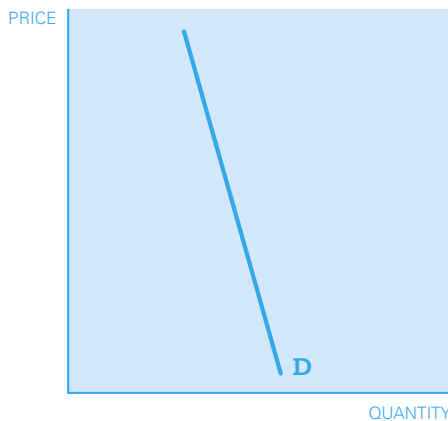
## How sensitive are potential students to changes in tuition levels?

Many colleges are interested in knowing how much their enrollments are likely to decline if they raise their tuition and fees. This question relates to the *elasticity of demand*. If demand is elastic, a small increase in price will lead to a relatively large decline in the quantity demanded. The demand for Bic pens is elastic because people can easily substitute other brands of pens. The demand for automobiles is elastic in the short run, because a small percentage increase in price constitutes a large chunk of the average consumer's budget. In addition, consumers can fairly easily decide to keep their old cars for an additional year.

The demand for some other products is inelastic. This means that although there is probably a downward sloping demand curve, the quantity demanded is not very sensitive to changes in price. The demand for insulin is inelastic because it is a necessity for those who use it, and there are no good substitutes. The demand for salt is inelastic because even if the price doubles or triples, consumers won't notice it much in their budgets. Figures 6a and b illustrate elastic and inelastic demand curves.



**Figure 6a: Elastic Demand.** Demand is elastic if the quantity demanded changes considerably in response to small changes in price.



**Figure 6b: Inelastic Demand.** Demand is inelastic if the quantity demanded is not very sensitive to changes in price.

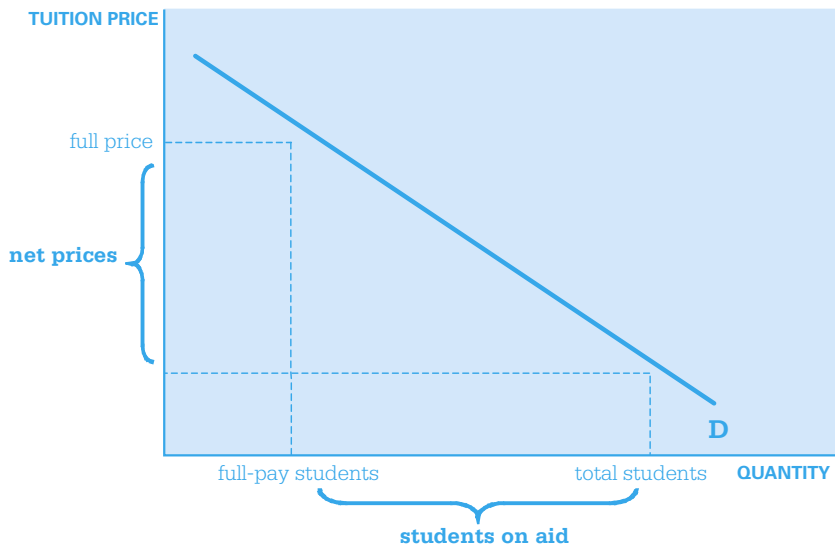
The elasticity of demand for college is an important question because it has a major impact on institutional revenues. Suppose tuition increases by 5 percent this year. If enrollment declines by exactly 5 percent, revenues will remain constant. If demand is inelastic and enrollment declines by less than 5 percent, total revenues will increase. But if demand is elastic and enrollment declines by more than 5 percent, total revenues will decrease as a result of the increase in tuition. While precise measures of elasticity are difficult to obtain, most of the available evidence suggests that

the actual elasticity of demand for college education in general, as well as for particular institutions, is lower than much of the public discussion about the dangers of rising tuitions might suggest. However, relatively small price changes do have a significant impact on the educational decisions of low-income students, who are much more price-sensitive than are those from more affluent families in terms of choice of institution and, in particular, in terms of enrollment in higher education.

# Price Discrimination: Different Prices for Different Students

What circumstances allow colleges to charge different prices to different students and why does this make sense?

Many products are sold under circumstances that require the seller to charge the same price to all consumers. The supermarket would not operate very well if there were not standard prices for crackers and hamburger meat. There are other products whose sellers can charge different prices to different groups of consumers, depending on the consumers' willingness to pay. Airlines charge business passengers more than vacation travelers. Business travelers have *inelastic* demand, and are not likely to cancel their trips because of fare increases. Demand for vacation travel is much more *elastic*. Airlines manage to charge different prices to these different groups by imposing restrictions on the lower fares that business travelers are frequently unable to meet. Charging different prices to different consumers is called *price discrimination*. If producers can price discriminate, charging each consumer the maximum amount he or she is willing to pay, they can reap higher profits than if they charge everyone a price low enough to get the last consumer into the market. See Figure 7.



**Figure 7: Price Discrimination.** The downward sloping demand curve indicates that some consumers are willing and able to pay higher prices than others for the same product. Suppliers that price discriminate charge each consumer a price as close as possible to individual willingness to pay. The distance between the full price and the net price is the price discount or grant amount. The distance between the quantity of full-pay students and the quantity of all students is the number of students receiving grant aid.

Another example of price discrimination is journal prices that are much higher for libraries than for individual subscribers. This price discrimination works only as long as the consumers can be prevented from trading. If individual faculty members were to pass their personal subscriptions on to the library, the pricing system would fall apart. If the supermarket tried to charge chocolate addicts more for candy than they charge dieters, the dieters would soon start buying candy at low prices and selling it to the chocolate addicts.

Colleges and universities *price discriminate* when they offer financial aid. The net price is different for different students, despite the fact that they are purchasing the same commodity. Need-based aid allows students with limited financial resources, who could not attend if they were charged the full sticker price, to pay a lower price. Need-based aid price discriminates on the basis of *ability to pay*. Other forms of student aid may price discriminate on the basis of *willingness to pay*. Highly qualified students may

be less willing to pay for College X because they have a choice of many other selective institutions. Less qualified students will be more willing to pay—they will have less elastic demand—because they have fewer options.

# Opportunity Cost: What Are the Trade-Offs?

## What is the real total cost of attending college?

Economists do not measure costs simply in terms of out-of-pocket expenditures. The true cost of an activity includes all of the resources devoted to that activity that could have been used for another purpose. The total cost of attending college includes not just tuition, but also foregone earnings. If a student could be earning \$25,000 a year by working full-time but chooses to attend college instead, that \$25,000 opportunity cost is part of the real total cost of attending college.

The opportunity cost of a particular activity is the best possible alternative to that activity. If you decide to spend the day catching up on work in the office, you sacrifice the time with your family. That sacrifice is the opportunity cost of your work. Students should understand that the total cost of college is greater than the calculated cost of attendance. They should also understand that, for example, the opportunity cost of spending lots of time in social and extracurricular activities may be academic success.

# Costs and Revenues: Total, Average, and Marginal

The cost of additional students is not the same as the overall cost per student.

Profit-making firms are interested in maximizing the difference between their revenues and their costs. Despite their primary mission of providing educational opportunities, not-for-profit colleges and universities must also pay considerable attention to managing both revenues and costs. Economists have some precise concepts that are useful in understanding the decisions colleges and universities face, both in terms of the optimal size of the student body and in terms of setting tuition and fee levels.

The concept of *total cost* is simplest. It refers to all of the institution's expenditures over a certain period of time, say an academic year. The economic concept of cost is different from the accounting concept in that it includes opportunity costs. A firm that is making a 1 percent rate of return on its investment will, for accounting purposes, have positive profits. But from an economic perspective, the opportunity cost of the invested funds—the return they could have generated in the best available alternative use—has to be taken into consideration. In economic terms, this firm is probably suffering losses, since its revenues do not cover its opportunity costs. Similarly, if a college enrolls 50 students to

whom it grants tuition waivers, it does not actually shell out money to these students. But if these 50 students take the place of 50 paying students, then the tuition waivers constitute a very real cost.

*Average cost* is usually referred to as cost per student. If a university spends \$100 million a year to educate 5,000 students, the average cost of education is \$100 million/5,000, or \$20,000.

Does this mean that the college should not accept a student from whom it cannot collect \$20,000 of tuition, unless it is making a conscious decision to take a loss on the student in order to provide equal opportunity or diversity in the student body or to purchase some other benefit? No. The relevant concept for making this decision is *marginal cost*. Marginal cost is the change in total cost that results from producing one more unit—in this case, from enrolling one additional student. For colleges and universities, the marginal cost of additional students is usually very low—much lower than average cost. Once the classrooms and dormitories are built and the faculty hired, an extra student doesn't add much to the cost of operation. There is a limit to this of course. If the college decides to enroll an additional 200 students, it will probably have to hire additional personnel and expand facilities. But for most institutions, the marginal cost of a few additional students is quite low.

In order to determine whether the school's financial situation will improve with the enrollment of a student who pays \$4,000 in tuition, the relevant question is whether or not \$4,000 covers the marginal cost of educating the student. Does the student add more to revenues than she does to costs? If so, from a purely short-term financial perspective, the student should be enrolled. The same principle explains, for example, why airlines sell seats at low fares if they think they will not otherwise be filled. Once the plane is flying, the marginal cost of additional passengers is very low. Of course, if the total cost of flying an airliner with a capacity of 500 passengers is \$250,000, the airline will lose money if it doesn't charge an average of at least \$500 per person. But it makes sense to let an extra person come on board at the last minute even if he is willing to pay much less than this—just enough to cover snacks and any

extra fuel cost resulting from the additional weight.

Marginal costs and benefits are also the relevant concepts for determining incentive effects. One place in the need analysis system where incentive effects are particularly important is with respect to savings. The need analysis system is frequently criticized for creating a savings disincentive because of the reality that the expected contribution is higher for families who have saved than for those who have similar incomes but no assets. Evaluating the savings disincentive involves determining the marginal assessment rate on savings. Under current formulas, an extra dollar of savings would increase the expected contribution by a maximum of 5.6 cents. The question is whether a marginal assessment rate of 5.6 percent is high enough to have any impact on savings behavior. A marginal rate of 95 percent would certainly discourage savings, but the existing marginal rate is low enough that families who save will clearly have an easier time making their expected contributions than those who must rely entirely on current income and borrowing.

# Market Structure: Competition Versus Monopoly Power

How much competition is there among institutions, and how much monopoly power do colleges have?

Market structure refers to the degree of competition that exists among firms in an industry. At one end of the continuum are *perfectly competitive* industries with many small firms, none of which have a big enough share of the market to noticeably influence price. At the other end of the continuum are *monopolies*, markets in which one firm operates without competition. Firms in perfectly competitive industries sell products that are not readily distinguishable from the products of their competitors. Because it is virtually impossible for them to differentiate their products from those of others, they cannot raise their prices above the “going” price without losing their customers. If existing firms in a perfectly competitive industry are making high profits, others will choose to enter the industry, which by definition is characterized by easy entry and exit. This means that high profits will not persist. New firms entering will try to break into the market by charging a slightly lower price. This process will continue until the product price just covers average costs of production, and profit rates are comparable

to those available elsewhere in the economy. The market for eggs (in the absence of any government interference with prices) would be an example of perfect competition. The members of the egg industry have, at times, gotten together to advertise “the incredible edible egg” or to counter fears about eggs causing heart disease, because individual egg producers cannot succeed in making consumers think their eggs are any better than any other farmer’s eggs. Prices of eggs tend to be fairly similar, since people are unlikely to pay significantly more for one brand than another.

*Monopolistic competition* resembles perfect competition in that it involves many small firms and a high degree of price competition. But in this sort of industry, firms are able to differentiate their products, either through brand identification or through slight differences in the characteristics of the product. Firms in monopolistic competition will be able to charge higher prices if they can create brand loyalty, but because there are close substitutes produced by competing firms, they, like firms in perfect competition, are not likely to maintain high profits over the long run. The clothing industry is monopolistically competitive. People are willing to pay higher prices for brand names, but there are many firms in the industry and new firms can easily enter to compete with existing firms.

If brand loyalty is so strong that the products of competing firms do not appear to consumers to be close substitutes, or if there are other barriers to entry, a small number of firms may dominate an industry, creating an *oligopoly*. A few firms can share the market, earning profit levels higher than those enjoyed by firms in more competitive industries. The barriers to entry of new firms may involve significant capital costs, such as those involved in opening an automobile factory, or they may simply involve advertising and consumer confidence. Breaking into the cola industry, for example, is no small feat, despite the relative ease of the production process itself. A variety of pricing patterns may appear in oligopolies, but prices are likely to be higher than they would be if the industry were less concentrated.

Finally, in a *monopoly*, where one firm captures the entire

market, no close substitutes are available. Some monopolies exist because of economies of scale that make it inefficient for the market to be divided up. Historically, this was the logic behind the monopolies enjoyed by local telephone companies and utilities. Other monopolies exist because of more artificial barriers to entry, such as patents. Monopolies can charge higher prices than other types of firms because they face no effective competition.

Few industries fit exactly into any one of these four market structures. Still, the models are useful in pointing out the relevance of competition and of monopoly power in understanding pricing and production policies. Price discrimination is an option only if firms have some degree of monopoly power, so that the customers being charged higher prices cannot turn to other firms for the same product. Price discrimination requires a downward sloping demand curve, whereas firms in perfectly competitive markets face horizontal demand curves. No consumers are willing to pay higher prices for the output of one producer when perfect substitutes are available from others. The prevalence of price discrimination in higher education implies that there must be some degree of monopoly power in the industry. That is, many colleges and universities have the “power” to raise prices without losing all potential customers.

It is easy to see that higher education is not perfectly competitive because the products offered by individual institutions are not perfect substitutes. There are very noticeable differences in the type and quality of education offered at different colleges and universities. Schools with national name recognition can charge higher tuition than less well-known institutions without losing all of their applicants. The number of colleges and universities in the market suggests that the industry may be closer to monopolistic competition than to oligopoly. The answer to this depends, of course, on how the market is defined. It could be argued that in the state of Utah, where there are nine colleges and universities and about 80 percent of students attend in-state institutions, there is an effective oligopoly. A similar argument might be made about the Ivy League universities, since they may be perceived as a separate

market from the other colleges and universities in the country.

The question of the degrees of competition and monopoly power existing within higher education generated considerable attention in the early 1990s, when the U.S. Department of Justice challenged the financial aid policies of a group of selective private colleges. The contention was that the colleges were colluding to set prices, a practice that is viable only in oligopolistic markets, with small numbers of firms that can carefully monitor each others' behavior, with considerable barriers to entry, and without close substitutes. This may be a reasonable description of certain segments of the higher education industry, like the two mentioned above, even though it clearly does not describe the industry as a whole.

Whether or not the Justice Department was justified in its accusations and whether or not the cooperative financial aid practices were socially beneficial are complex questions with subjective components. There is no question that financial aid policies have been affected over the past decade by the limits on communication about aid policies imposed by concern over antitrust restrictions. To what extent the increased competition for students is a direct result of these restrictions is not clear. But the current strategic use of financial aid highlights the reality that competition can have both positive and negative social effects, depending upon the circumstances.

# Human Capital

Education is an investment that increases students' productive capacity and earning power over their lifetimes.

The term *capital* has a somewhat different meaning in economics than in common parlance. Capital refers to goods that have been produced in order to aid in the production of other goods and services. Capital and labor are the major categories of inputs into the production process. Labor is more productive than it otherwise would be because it works together with capital. People can produce more goods and services in a given amount of time because of the fact that they have machines with which to work.

Increases in productivity (output per work hour) in the economy over time are attributable not just to increases in the capital stock and improvements in technology, but also to increases in workers' skill and knowledge levels. It is not just machinery or physical capital that increases the productivity of labor, it is also education and training. This education and training increases *human capital*—the qualities embodied in human beings that increase their ability to create goods and services.

Human capital theory helps to explain wage differentials. People with higher skill levels tend to earn higher wages because they are able to produce more than people with lower skill levels and because workers with specialized skills are harder to replace. Empirical studies reveal clearly that people with more years of education, training, and labor-force experience command higher wages. These higher wages constitute the return to the acquisition

of human capital.

Because a college education increases human capital and thus earnings potential, it is an investment whose rate of return can be measured. The price of the education can be compared to the increased earnings over a student's lifetime. The more a college education increases earnings potential, the more students should be willing to pay for that education. In other words, an understanding of human capital, of the role of education in increasing an individual's human capital, and of the role of human capital in determining earnings can help people to evaluate what is a reasonable amount to pay for education.

The idea of education as an investment that pays off over a lifetime also makes it much easier to explain why it is logical to save and to borrow to finance higher education. The concept of borrowing to finance investment in physical capital is well-established. Few people would think it advisable to avoid all capital investment just because they don't have the cash necessary to pay in advance for the plant and equipment they need to operate a business. They understand that loans can be paid off through the revenues generated by the capital investment. This same reasoning can be applied to investments in human capital.

# Externalities: The Spillover of Benefits

Individual students are not the only people who benefit from education. Society as a whole benefits from a more educated populace.

Private markets will lead to inefficient outcomes if the conditions required for perfect competition are not met. One example of such a market failure is that of *externalities*, which exist when transactions between consumers and producers have an effect on third parties not accounted for by the market. The most common example of an externality is environmental pollution. Markets overproduce pollution because in the absence of property rights for air and water, firms do not view the destruction of these common resources as constituting a cost of production. They tend not to account for environmental degradation when making profit-maximizing decisions. The *social cost* of production exceeds the *private cost* of production.

If the *social benefit* of the consumption of a commodity is greater than the *private benefit*, there is a *positive externality*. The idea that there are significant positive externalities in elementary and secondary education is rarely debated. A literate citizenry is prerequisite to the functioning of a democracy and the skilled workforce fundamental to economic development depends on universal education. The positive externalities of higher education

are smaller and more elusive. But to argue that there are no externalities, one would have to accept the unlikely idea that the entire increase in productivity resulting from higher education is reflected in wages. In fact, higher education levels are correlated with reduced dependency on social safety nets, reduced criminal activity, higher levels of civic participation, and higher tax payments. Even when high productivity levels are accompanied by commensurate individual financial rewards, the rest of society benefits from the contributions of productive citizens. We are all affected not only by the level and quality of our own educations, but by those of the people around us who can communicate and work more effectively if they are well-educated. A worker's productivity is likely to be higher if his coworkers are more productive. Moreover, even if there is no shortage of, for example, scientists, if the best potential scientists are unable to enter the field because of financial constraints, society is poorer than it needs to be.

The existence of positive externalities is frequently cited as an argument for government subsidy of education. People will pay for education only to the extent that they themselves enjoy the benefits. If a significant portion of the benefits accrues to society at large, in the absence of subsidies people will choose to consume less than the socially optimal amount of education. From an institutional perspective, it may also be useful to think about the externalities resulting from subsidizing particular students. For example, grants to students designed to increase diversity will certainly provide benefits primarily to the students whose education is subsidized. However, the presence of students from different backgrounds on campus may also create *positive externalities*, enhancing the educational experiences of students other than the direct beneficiaries of the grants. The same argument might be made about merit-based aid that succeeds in enhancing an institution's intellectual environment.

# Incomplete Information

Students may not know in advance exactly how much a college education will be worth to them.

Another type of market failure exists if consumers do not have complete information about the products available to them. If consumer information is imperfect, markets are less efficient than they otherwise would be. Consumers will not be able to gravitate to the lowest-cost producer for equivalent products, nor will they be in a position to accurately weigh the costs and benefits of their purchases.

Standard examples of market failure involving incomplete information include markets for medical care, where consumers must rely on suppliers for information about the need for services and the quality of those services. In the case of higher education, there are several related problems. The consumers are often young people. They have no experience with higher education and may underestimate its value. Their desire for immediate gratification and undervaluing of future benefits may cause young people to choose the job market (or a life of leisure) over human capital investment, even if this choice is inefficient in the long run.

# Consumption Versus Investment Goods

The benefits of education last longer than the college years; they last for a lifetime.

*Consumption goods* are purchased and consumed because of the utility they directly provide. We buy apples because we enjoy eating them, and we go on vacations in order to relax. While the consumption of these goods may have some long-term effects, their primary impact is immediate. *Investment goods* are intermediate goods. They do not provide utility in and of themselves, but increase opportunities for future production and consumption. Firms invest in machines in order to increase their future productivity. The investment frequently involves postponing production or postponing profit streams.

Residential housing and consumer durables are a form of investment expenditures that provide a stream of consumption over time. No one buys a car with the idea that they will get \$30,000 worth of utility from the car in the year of its purchase. Borrowing to pay for a car seems reasonable because the car will provide benefits over time. Loans for home purchase are longer term than those for car purchase because the home provides benefits long after a car purchased at the same time has been reduced to scrap.

College has elements of both consumption and investment. College is an investment in human capital and to the extent

that it increases future earnings potential, it is an investment that can reasonably be paid for over time. Nonetheless, there is a consumption component to college, since students gain personal satisfaction from their studies and may well enjoy the student lifestyle. The current focus on the amenities provided on many college campuses highlights the short-term consumption component of the college experience.

The distinction between consumption and investment is very important in terms of college. It has implications for financing strategies; it makes it obvious that insisting on paying for college entirely out of current income, when the benefits extend over a lifetime, is not rational.

# Merit Goods

There is a general consensus that the opportunity for higher education should be available to all, regardless of ability to pay.

It is a long-standing notion that the fundamental value of equal opportunity in our society requires that access to higher education not be limited by ability to pay. It is not “fair” that bright and motivated students should be unable to further their educations simply because their families cannot afford to pay. This suggests that we think of higher education as a *merit good*—one to which all members of society should have access. The specification of merit goods is dependent on social and historical circumstances and may be controversial. But economic reality and the current structure of the labor market make it difficult to argue that access to higher education should not be a merit good in our society. Average earnings for college graduates working full-time are about 65 percent higher than those of high school graduates and the gap is growing; the unemployment rate of college graduates is about half that of high school graduates. Denying access to higher education is tantamount to denying access to economic success.

The idea of higher education as a merit good creates a strong argument for public need-based financial aid. It may also be a significant determinant of institutional decisions to use need as the primary criterion for distributing subsidies to students.

# Models of the Firm and Higher Education Institutions

Colleges provide goods and services to consumers, just as other firms do, but colleges are unique in a variety of ways.

This discussion of the application of economic principles to financial aid and higher education pricing does not imply that the standard economic models of the firm and of the behavior of producers and consumers can be applied unmodified to higher education institutions. While it is useful to think of colleges and universities as firms providing a product, of faculty and staff as inputs into a production process, and of students as utility-maximizing consumers, there are also some dangers to this approach. The issue is not that it demeans the quality or importance of education to think of it as a commodity. Rather, the conditions of production and consumption of higher education are, in some ways, unique. Ignoring this uniqueness can lead to some short-sighted decisions in the supposed interest of efficiency.

One unusual characteristic of educational institutions is that the consumers are a critical input into the production process. This is true in the sense that education is not something that automatically provides benefits to anyone who purchases it. Considerable time

and effort on the part of the consumer are required. No level of “quality product” can guarantee that the consumer will get the benefit he anticipated. This means that the provider has much less control over consumer satisfaction than is the case with most products.

Moreover, the quality of the product for each consumer depends on who else is purchasing the product. No matter what the efforts of faculty and staff, no matter how extensive the facilities, no college or university can produce quality education without quality students. Each student’s educational experience is significantly affected by the other students in the classroom. For this reason, and because institutional reputation depends to a considerable extent on the quality of both the students who are admitted and those who graduate, colleges and universities are not generally willing to sell their product to everyone who is willing to pay. If they did this, they would end up with a deteriorating product. There are few firms in other industries that turn away customers who are willing to pay because they don’t meet the “admissions standards.” But if colleges having trouble filling their classes forget about the impact the composition of the student body has on the quality of their product, they are in danger of losing their ability to deliver quality education.

Another unusual characteristic of education is that consumers generally do not fully appreciate the value of the product until after they have consumed it. An understanding of what education can do for one’s life (other than increasing earnings) is likely to develop over the lifetime of the student. It is certainly not likely to exist among 18-year-old high school graduates.

This phenomenon has significant implications for how educational institutions respond to consumer demand. For profit-maximizing firms in most industries, monitoring consumer preferences is vital and modifying products in accord with changing tastes is important for survival. While educational institutions clearly have to be responsive to consumer demand in order to survive, if colleges go too far along this path they may be at risk of failing to deliver the product that defines their mission.

The familiar questions of whether students should take required courses and whether colleges should continue to offer relatively unpopular programs with intellectual justification are related to this phenomenon. There is some danger in the current market for higher education that more and more institutions will cater to the short-run vocational training demands of students. While these demands certainly need to be considered, and while some institutions may perceive changing in this direction as the only means of survival, in the end people are not likely to pay the high price of education for simple training. And the cost of such change could be that liberal education, with its significant personal and social value, will be allowed to disappear because 18-year-olds don't understand its import.

This situation is complicated by two other unique characteristics of the higher education market. One is the prevalence of third-party payers. The reality is that despite the increasing prevalence of student loans, most students benefit from some combination of parental contributions, government subsidies, and institutional aid. This means that willingness to pay is not merely a matter of the individual consumer's attitude toward education. Educational institutions must market themselves to parents as well as to students. This may ease the problem that young people don't fully appreciate the benefits, in the case of parents with resources. It also means that many students who themselves would not be willing or able to pay the full price will attend—clearly a necessity for the viability of many institutions in the current market.

Finally, higher education is a product most people purchase only once. No matter how satisfied they are with their college educations, the most people can do is recommend the school to family members or friends. Educational institutions are forced to spend considerable resources on consumers who have virtually no chance of being repeat customers. While some of these expenditures create attributes that improve reputation and draw in future students, others affect only current students.

These characteristics of the market do not mean that general

economic principles do not apply. But they do mean that those making financial decisions at colleges and universities should think carefully about the uniqueness of their market and about the position of their particular institution within that market. The principles behind the demand for higher education and the determination of ability to pay have general applicability. But how the understanding of ability to pay is used to determine policy is a complex issue, with different answers appropriate in different circumstances.



# Part II:

## Need Analysis Methodology

The economic principles explained in the preceding section can provide a foundation for the design of need analysis and for the evaluation of existing practices. They do not, however, dictate one specific set of criteria that should be used for ranking students and families or for determining precise levels of ability to pay. There is no absolute standard against which a need analysis methodology can be measured, and many of the judgments involved in constructing a methodology are subjective. Nonetheless, it is useful to examine aspects of current practices and potential modifications to these practices for their consistency with economic principles.

In particular, the principles of horizontal and vertical equity explained on page 8 in Part I are fundamental to evaluating any need analysis methodology. To be vertically equitable, need analysis must generate appropriately different expected contributions for students and families with different financial circumstances. An accurate ranking of aid applicants is a necessary prerequisite for this endeavor. To be horizontally equitable, the system must treat people with similar financial strength equally. This can only be accomplished if the different aspects of an applicant's

circumstances are evaluated in a reasonable and systematic manner.

The discussion that follows focuses on the fundamental components that underlie any formula determining ability to pay. It also analyzes the economic rationale for particular aspects of current need analysis methodologies and suggests some perspectives that might strengthen the economic soundness of the systems for determining need. Not every issue discussed is relevant for every institution since different institutions with different mandates, different resources and different student bodies face a wide variety of problems and options. Most important is that there is a way of thinking about need analysis that incorporates economic reasoning. Aid professionals who have thought about the issues included here from this perspective will be better able to apply the framework to the particular questions confronting them.

This discussion will not attempt to answer all of the imponderable questions faced by financial aid professionals. The starting point is, in fact, acceptance of the reality that reasonable and thoughtful people will always disagree on the precise components of a need analysis system. But an understanding of the fundamental economic principles underlying the determination of ability to pay and the design of a need analysis system should help us to gain a common perspective on the key elements of the system and on the areas in which compromise makes sense.

# Defining Necessities

Even if we could agree on a clear ranking of aid applicants based on financial capacity, the precise amount of the expected contributions would have a significant arbitrary component. It is tempting to argue that there is a certain amount required for necessities and that we should be able to agree on a percentage of discretionary income to be devoted to paying for education. But defining necessities is not simple. Clearly everyone needs basic food, clothing, and shelter. But how many families contemplating higher education for their children really define necessities so narrowly? Is owning a television set a necessity? Is buying new sneakers when the old ones begin to tear a necessity? Is ordering pizza occasionally a luxury that we should expect families to sacrifice? What about a second car?

An interesting aspect of the subjective nature of necessities is that people accustomed to higher living standards define necessities more broadly than do those living under severe financial constraints. If we allowed actual expenditures on food, clothing, and shelter to constitute necessities, we would end up providing much more generous allowances to wealthier families. This would obviously be an untenable foundation for a need analysis system. On the other hand, there are some ways in which absolute necessities *do* expand with living standards. Minimum wage workers are rarely expected to show up in designer suits. For corporate executives, on the other hand, wearing the correct clothing can make the difference between success and failure.

The impossibility of precisely defining necessities is sufficient to make the determination of need subjective. But the difficulty of ranking people according to capacity to pay is an even more serious

impediment to constructing the optimal need analysis system. We have equivalency scales to approximate the difference family size makes in living standards, but they are imprecise. In fact, a number of these scales exist, based on different assumptions about the extent of economies of scale enjoyed by larger households and about the way in which cost of living changes with age. Geographical differences in the cost of living present another problem. It is clear that prices are higher in Manhattan, New York, than in Manhattan, Kansas, but it is impossible to adjust for the array of differential costs of living faced by families and students all across the country.

Moreover, it is not obvious which circumstances should be considered as affecting ability to pay. Does a two-earner family have the same options as a one-earner family with a similar income? How does the status of a family that owns its own home but has high mortgage interest payments compare to the status of a family that rents? How do liquid and nonliquid assets affect a family's ability to finance college? Perhaps the most difficult question is whether, and how, the decisions a family has made in the past about saving and spending should affect our view of them as they enter the need analysis system.

Both income and assets contribute to financial strength and therefore to the ability to pay for college. The discussion below separates these two factors to examine their contribution to ability to pay, both from a theoretical perspective and from the perspective of need analysis methodologies. It examines alternative definitions of income and analyzes the exemptions from income used to determine expected family contributions, then takes the same approach for assets. The last step is to examine the assessment rates applied to income and assets in the need analysis system. Before addressing these specific components of the need analysis system, the text addresses the fundamental question of whether expected contributions should be based only on a current snapshot of the household's financial circumstances, or whether a longer-term approach should be taken.

# Snapshot Versus Long-Term Financial Capacity

At its inception a half-century ago, need analysis was grounded in several basic principles. One was the idea that aid applicants should be taken as they appear at the time of application. In other words, a family's past options and choices should not be taken into consideration or judged. The need analysis system would simply look at applicants' current income and assets and determine the amount they were able to pay in the year. This view became deeply ingrained in the financial aid profession, but has been brought into question in recent years by the focus on education as an investment and the recognition that few families can afford to pay for college without planning over time, saving, and borrowing.

The logic behind the "snapshot" approach is both pragmatic and philosophical. The purpose of the aid system is to allow potential students who do not have adequate financial resources available to attend college. Punishing students whose parents chose to travel extensively and buy expensive cars instead of saving for college would violate the principle of providing access to all regardless of ability to pay. But the arguments against this principle appear much stronger, now that the cost of college is significantly higher relative to family incomes than it was at the time the original methodology was devised. It is clear to anyone comparing expected family contributions to incomes that few families will be able to pay these contributions out of current income and liquid assets.

Economists studying the need analysis system have

consistently argued that thinking of expected contributions as relating to current income is illogical. Education is an investment in human capital, not a consumption good like restaurant meals and vacations. Education provides students with benefits that will last over their entire lives. While some of the most important benefits are nonpecuniary, there is no doubt that a college education significantly increases expected future earnings. Just as businesses expect to borrow to finance capital investments, but see accumulating debt to meet the payroll as a sign of significant financial distress, it is quite reasonable for parents and students to borrow to pay for college, even if they are wise enough not to run up credit card bills for entertainment purposes.

For parents, who know well in advance that their children will be graduating from high school and contemplating college, saving over time for higher education is surely a wise decision. There is no good argument for cutting deeply into consumption expenditures for the four years a child is in college in order to live at a much higher standard for the 10 years preceding and following college.

This concept is well established as the “life-cycle” model and the “permanent income” hypothesis in economics. The idea is that people even out their consumption over the long run more than they are able to even out their incomes. Young people who are getting an education or who are just starting out in the labor force and have young children tend to spend more than they earn. The same is true for retirees. But in the middle years, people at the peak of their earnings cycles should be able to save in order to pay back debts acquired earlier and prepare for retirement.

There is evidence that people react differently to a one-time windfall than to a permanent increase in income. The former simply does not allow the same change in standard of living enabled by the latter. Similar reasoning would suggest that if a major expense is looming—such as financing four years of college—people who are able to, will react by cutting consumption by a fraction every year for a long period of time, rather than experiencing a significant temporary decline in their standard of living for four years.

The implications of this theory are somewhat different for

independent students financing their own educations. Here the theory suggests that these students may live at a higher standard of living while they are in college than they would if they anticipated that their current low incomes would persist throughout their lives. In other words, borrowing while in school in order to be able to eat out occasionally may not be as irrational as it appears at first glance, if a student living on \$20,000 a year anticipates a long-term income of \$90,000 a year.

Given the reality that education is an investment with long-term benefits and one that can and should be anticipated and planned for, the idea that a narrowly defined snapshot view defines ability to pay is not satisfactory from an economic perspective. Economic theory suggests that diminished dependence on the idea that families should be “taken as they are” could reduce the savings disincentives inherent in the need analysis system and encourage families and students to think of education as an investment that must be paid for over time.

Financial capacity is actually a long-term concept and is not perfectly correlated with the circumstances of a student or family at any particular moment. Ideally, the need for subsidies for college would be based on long-term income histories. Two similar families with similar incomes over time would be expected to make similar contributions to education, regardless of the savings and consumption choices they have made. However, since the idea of collecting data on past income is not a practical one given current political and administrative constraints, recent annual income is the only viable basis for need analysis calculations.

It might, however, be possible for need analysis methodologies to give more weight to past and future educational needs and to incorporate assumptions about long-term income and savings options. The sections that follow on taxing savings, the treatment of multiple siblings, and educational income and savings protection allowances address the practical implications of these ideas.

# Defining Living Standards

The need analysis system relies on benchmark income levels to set several of the allowances against income and assets. For example, the Income Protection Allowance is based on an income level below which a household is assumed to have no discretionary income. The Asset Protection Allowance in the Federal Methodology is designed to allow a reasonable living standard for retired people.

Two different sources of data are used to determine these income benchmarks. Federal Methodology (FM) relies on the Bureau of Labor Statistics (BLS) family budget levels, which were also the foundation of the Uniform and Congressional Methodologies. These standards are based on an assessment of necessary living costs calculated in 1981 and updated annually for changes in the Consumer Price Index.

Institutional Methodology (IM) relies instead on the Consumer Expenditure Survey (CEX), an ongoing survey of total household consumption expenditures conducted by the Bureau of the Census for the Bureau of Labor Statistics. The CEX involves both diaries completed by participating consumers and interviews. Average consumption expenditures in the CEX are affected both by price changes and by changes in consumption patterns resulting from changes in tastes, habits and lifestyles, the availability of new products, and changes in the relative prices of goods and services. In other words, CEX living standards are more reflective of current consumption patterns than are BLS living standards.

There are four benchmark income levels in IM representing

different standards of living. The *prevailing family standard* is set at the median expenditure level of all households composed of a married couple and two children. The other standards are fixed relative to this level, with the *social minimum standard* equal to one-half of median expenditures, the *lower living standard* equal to two-thirds of the median, and the *social abundance standard*, which is 50 percent higher than the median.

# Treatment of Multiple Children in College

As a direct result of the snapshot approach incorporated into the need analysis system since its inception, Federal Methodology calculates the amount a family can be expected to pay and then divides that amount over the number of college students in the family. The logic here is that need analysis determines the amount the family can reasonably be expected to pay in a given year, and therefore, asking them for more when multiple family members are in college would be unreasonable. Many aid professionals also believe that dividing the expected parental contribution by the number in college makes the system easier to explain to families.

This practice, however, results in a serious horizontal inequity. The spacing of a family's children has a dramatic effect on the total cost of educating those children. A family with twins going through four years of college simultaneously will end up paying a total of four parental contributions (PCs). A family with two children four years apart will pay a total of eight PCs.

This outcome becomes even less reasonable if we think of higher education as an investment to be paid for over time. Both families will be financing education over a period of time much longer than the college years, and the burden for the two should be similar. If the family with twins paid for one child out of current income and assets and borrowed to finance the twin, repaying the loan over the four years after graduation would make its situation similar to that of the family with children four years apart.

The College Board's Institutional Methodology initially took

the same approach as FM to families with multiple college students. However, the revision of IM in the 2000-01 academic year somewhat reduced this favorable treatment. The formula now assesses families with two children in college 60 percent of a PC for each child. Families with three children in college at the same time contribute 45 percent of a PC for each child, resulting in a total parental contribution 35 percent higher than that expected from a family with only one child in college

From a purely economic perspective, spacing of children should not affect the long-term financial effort expected from families. In practice, asking for two full PCs from families with two children in college would likely cause considerable face validity problems. The appropriate compromise is a subjective question, but considerations of economic equity point in the direction of reducing the benefit given to families with more than one child in college at a time.

# Defining Income

The standard economic definition of income is straightforward and comprehensive. Income over any period of time is the sum of consumption and change in net worth. Cash coming into the household can be spent on consumption, saved, or used to reduce debt. Noncash benefits including in-kind transfers such as food stamps, benefits like health insurance coverage, and accrued capital gains on real and financial assets also constitute income.

This concept of income, while theoretically simple, is very difficult to measure in practice and almost impossible to tax. The federal personal income tax system defines income quite differently. Adjusted gross income (AGI) includes cash income from many, but not all sources. It excludes, for example, the interest on municipal bonds, part of Social Security income, and other categories of government transfers such as Temporary Assistance for Needy Families (TANF). Unrealized capital gains and in-kind transfers and benefits are not included. Subtractions from gross income allowed to calculate adjusted gross income include employee business expenses, contributions to certain retirement plans, penalties for early withdrawal of savings, alimony paid, and business losses. Exemptions and deductions are applied to AGI to determine taxable income.

The need analysis system uses AGI as a base for determining income, since this is the easiest amount for families and individuals to report and the easiest number to verify. However, all of the established methodologies have consistently modified this definition by also including untaxed income from Social Security, TANF, child support, and other sources.

Like the income tax system, the need analysis system is based

on annual income. Although, as discussed above, longer-term income data would provide a more accurate description of financial capacity, it is not practical to collect more than one year—or sometimes two years—of data at any point in time.

# Whose Income Is Relevant?

Some students are considered by the need analysis system to be responsible for financing their own educations, while others are required to use both their own resources and the resources of their parents. Students have the incentive to declare themselves independent if at all possible, since independent status may significantly increase their eligibility for financial aid.

Until 1992, anyone who received more than \$4,000 of income from a source other than parents and was not claimed by their parents as a dependent for federal income tax purposes qualified as an independent student. This definition allowed students whose parents could, and did, subsidize their educations to receive aid that could otherwise have been directed to students who were truly on their own. The current definition of independence is simpler. Graduate and professional students, married students, veterans, orphans, wards of the court, individuals with legal dependents other than a spouse, and students aged 24 or older are automatically considered independent. Other students are considered dependent unless determined otherwise through professional judgment. This definition of independence is a considerable improvement in the sense that it reduces the opportunities for students to alter or misrepresent their behavior in order to become eligible for additional aid.

For students who are either dependent on their parents or married, the income of other family members is considered in determining ability to pay. Income is, however, assessed at

different rates depending on who earns it. The income of parents of dependent students is assessed at marginal rates ranging from 22 percent to 47 percent in FM and from 22 percent to 46 percent in IM, after deductions for taxes paid, an income protection allowance, and other allowances against income. The income of dependent students is assessed at the higher rate of 50 percent and the income of independent students without dependents is assessed at 50 percent in FM and 70 percent in IM. The logic behind this distinction is that students' primary responsibility is to pay for their education, whereas parents have other responsibilities and are also not the primary beneficiaries of the investment in education.

The distinction between parent and student income is reasonable, but not the only viable approach. For many families, especially those with low incomes, children's income provides a necessary supplement to parents' income to fund general family expenses. Under these circumstances it would make more sense to assess family income as a whole. The work disincentive inherent in assessing income at very high rates is also a problem. The section on assessment rates (see page 89) addresses this issue in greater detail.

Perhaps a more serious question about whose income is relevant is the one relating to divorced and separated parents. Federal Methodology does not consider the income of noncustodial parents, but does include the income of stepparents married to custodial parents. In the past, the basic Institutional Methodology was similar to FM in this regard, but a supplemental form allowed institutions to consider the income and assets of noncustodial parents. Colleges and universities developed a variety of methods for measuring the ability to pay of these families.

Because about half of all marriages now end in divorce, the absence of a common approach to these families is increasingly problematic. An IM treatment is now being implemented that considers the income and assets of both natural or adoptive parents equally, regardless of whether they are married or divorced, and excludes the resources of stepparents. In addition to reducing

the variation in aid awards among similar colleges and universities, this practice will eliminate both the possibility for affluent parents to reduce their responsibilities by getting divorced and the disincentive for remarriage.

Overall, the questions of whose income should be considered in determining family contributions and whether incomes of different people should be assessed at different rates have no clear answers. But they should be considered carefully and answered not merely from the perspective of administrative convenience, but also from the perspective of horizontal equity and behavioral incentives.

# Allowances Against Income

## **Income Protection Allowances**

Both aid professionals and parents sometimes complain that the Income Protection Allowance (IPA) is too low because it is not enough for the family to live on. In fact, the need analysis system does not in any way incorporate the idea that the IPA is the family's living allowance. Instead, the idea is that up to the level of the IPA, a family's income is so low that it has virtually no discretion about how to spend its money. No one expects families to spend all of their money above the level of the IPA on college. Rather, some fraction of additional dollars should be devoted to college.

The IPA in Federal Methodology is based on the BLS lower living standard and is updated every year for changes in the Consumer Price Index. It is equal to \$21,070 for a family of four with one child in college in the 2004-05 academic year. The IPA in the College Board's Institutional Methodology is slightly different because it is based on data from the Consumer Expenditure Survey that, as explained on page 56, is based on current family expenditure patterns, which change from year to year both because of price changes and because of changes in consumption patterns. It is set at the lower living standard, which is two-thirds of median family expenditures, and is \$24,420 for a family of four with one child in college in 2004-05. Both methodologies allow increases in the Income Protection Allowance with family size and reduce it for

additional children in college, since some of the students' expenses are accounted for in the student expense budget.

Federal Methodology includes a separate IPA for dependent students and independent students without dependents. Some income is protected for dependent students, over twice as much is protected for single independent students and those married to other students, and other married students enjoy an even higher allowance accounting for joint living expenses and the fact that spousal income is included in the need analysis. Institutional Methodology takes a different approach to independent students, using a monthly maintenance allowance based on the median cost of living for students and their spouses and children during periods of nonenrollment.

The IPA does not represent an accounting of necessary expenditures or evaluate family consumption choices. The need analysis system simply acknowledges that very low levels of income allow virtually no optional expenditures, but requires that for families with discretionary income who are sending children to college, paying for education should be prominent among their choices.

### **Geographical Differences in the Cost of Living**

The appropriate level of the IPA is different depending on where the aid applicant lives. For example, \$25,000 goes much farther in the rural Midwest than it does in Honolulu or New York City. Unfortunately, no reliable and complete index comparing the cost of living in every area of the United States is available. It is also impossible to entirely separate the higher cost of living resulting from residence in a general area such as metropolitan Boston from the higher cost of living resulting from the choice to live in a suburb with expensive homes and high-quality schools instead of a less desirable town. Because of this, the geographical adjustments made in need analysis are generally quite limited. Institutional Methodology has recently implemented a new list of adjustment factors for major metropolitan areas. Because housing is the component

of budgets that varies most by location, differentials in housing costs are used to adjust the IPA and the Emergency Reserve Allowance (see page 85) upward. The effect of this change is to increase the allowance against income and assets, thereby reducing the EFC for aid applicants in high cost-of-living locations. No reduction in IPA is made for students who reside in areas where the cost of living is lower than the national average. This issue remains a challenge to efforts to create an equitable need analysis system.

## **Taxes Paid**

Both major need analysis systems subtract actual federal income taxes paid before assessing income. They also include allowances for federal Social Security and Medicare taxes, based on statutory rates, and for estimates of state and local taxes paid. Federal Methodology bases its allowance for state and local taxes on Internal Revenue Service data on itemized deductions for state income taxes and property taxes. Because of recent controversy over the updating of this allowance, it is possible that this approach will be modified by Congress at some point in time. For most states, the current table differentiates between parents with incomes above and below \$15,000, and there is also a separate rate for dependent students and independent students without dependents.

The state and local tax tables in IM are quite different from those in FM. They provide a higher allowance for most aid applicants because of the inclusion of sales taxes, which are included in the IPA under FM. In addition, incomes are divided into a number of bands for the assignment of tax rates, allowing the regressive nature of state and local taxes to be more fully incorporated. Sales taxes are regressive, requiring a larger portion of income from lower-income people than from higher-income people, because lower-income people tend to spend a larger percentage of their incomes on goods and services subject to these taxes. The distribution of the burden of property taxes is more ambiguous, but these taxes are generally believed to be

somewhat regressive. State income taxes are not progressive enough to compensate for the regressivity of other state and local taxes.

A separate set of rates applies to students, distinguishing between those with incomes above \$20,000 and those with lower incomes. The rates for dependent students and independent students without dependents include only income taxes since sales taxes are accounted for in the student expense budget and most of these students are not property owners. The data underlying this tax table are drawn from a detailed analysis of state and local tax payments conducted every few years by the Institute on Taxation and Economic Policy, a private nonprofit research organization.

### **Employment Allowance**

Both major need analysis systems include an allowance against income for families with two earners and for single parents. This allowance is intended to compensate for those expenses that result directly from the absence of a full-time homemaker in the household. It exempts from assessment a fraction of the earned income of the parent with the lower earnings, up to a maximum amount. In IM, the maximum employment allowance represents the difference between median expenditures for one- and two-earner households on items such as food away from home and personal household services. This maximum as a fraction of the full-time earnings of a minimum wage worker generates the percentage of earnings allowed.

### **Annual Education Savings Allowance and Other Allowances Against Income**

The College Board's Institutional Methodology provides several other allowances against income. The idea behind all of these allowances is that they represent necessary expenditures that require income that should not be viewed as increasing a family's ability to pay for college. One such allowance allows the exemption of medical and dental expenditures exceeding those of the average family. An optional allowance subtracts payments for elementary or

secondary tuition payments for siblings, up to a maximum based on average expenditures for public elementary and secondary education.

Most significant, however, is the allowance against income for both parents of dependent students and independent students with children to save for college for younger children. Consistent with the concept that college is an investment that should be paid for over time, including saving in advance and borrowing in addition to paying out of current income, IM assumes that families will set aside a certain fraction of their incomes each year for future educational expenses, making this amount unavailable for current college payments. The amount of the Annual Education Savings Allowance (AESAs) is based on families attempting to save one-third of their anticipated four-year contribution over an 18-year period.

# Defining Assets

Both income and assets contribute to a household's financial strength. Income is a flow of dollars coming into the household over a particular period of time. Assets are the stock of resources that have been accumulated over time. Households with higher incomes are likely to have an easier time accumulating assets because they may be able to save more. Nonetheless, the correlation between income and assets among households is far from perfect. Among those who apply for financial aid through the CSS/Financial Aid PROFILE®, a significant portion of those at the low end of the income distribution have relatively high net worth, while many of those with high incomes do not have measurable assets.

Some of the households with low incomes and large assets are undergoing temporarily difficult experiences such as unemployment; some are retired; some are small business owners with cash flow problems; but others are affluent people who, for tax purposes (or for the purpose of manipulating the student aid system) are able to disguise their incomes. Part of this discrepancy is because of the difficulty involved in defining and measuring income. The incomplete definition of income under the federal income tax system creates incentives for people to convert their income into forms that are taxed at lower rates or escape taxation altogether, and thus may be invisible in the need analysis system.

Households with high incomes and low asset levels may have had a recent large increase in income; they may have faced unusual circumstances, such as special needs children or high medical expenditures that have prevented them from saving or have depleted their assets. But they may also simply have made lifestyle

choices leading to high ratios of current consumption relative to planning for the future.

Assets take a variety of forms and only a fraction of them are recognized by the need analysis system. There are several possible ways to categorize assets. One is according to *liquidity*, or the ease with which assets can be converted into cash and spent. A bank or money market account is the most liquid asset other than cash. A certificate of deposit, which can only be redeemed after a certain period of time or with a penalty, is less liquid. Home equity, the form taken by the largest portion of the assets of financial aid applicants, is a nonliquid asset that has been rendered more liquid by the ease of obtaining home equity loans and lines of credit. Other nonliquid assets have to be sold in order to generate cash; they frequently have limited markets and are difficult to value. Although some institutional aid offices do collect this information and use it to make judgments, it is hard to imagine a need analysis system that would take the value of a family's automobiles or rare artwork into consideration, despite the fact that they are indicators of both standard of living and financial capacity.

Treating different forms of assets differently creates both efficiency and equity problems. As long as people have choices about the form in which to hold their assets, differential treatment will create incentives for people to alter their asset holdings in response to the need analysis system. The system motivates wasteful financial transactions and also fails to measure financial strength accurately. For example, because the current Federal Methodology does not take home equity into account, a family can reduce its expected contribution by taking savings out of the bank and using the funds to pay off part of its mortgage, even if this would not otherwise be the wisest strategy.

Horizontal equity problems also emerge. Two families in identical economic circumstances will be treated differently by the need analysis system depending on whether or not they choose to change the form of their assets. As long as we tax one form of assets and not another, we are providing the opportunity for people to manipulate the system and misdirect limited funds away from

those with true need, and in the direction of those savvy enough to make themselves look needy.

The questions of the extent to which assets contribute to ability to pay and whether or not different types of assets should be treated differently have been ongoing issues in the need analysis system. Current practices vary widely. Federal Methodology ignores all assets for many families with incomes under \$50,000; home equity and family farm assets are excluded for all filers. The College Board's Institutional Methodology assesses a much broader base of assets. It does not use income level as a determinant, but considers assets for all filers. It includes both liquid and nonliquid assets although like FM, it provides special treatment for owners of businesses and farms, as well as, in some cases, for home equity.

Two very different philosophies underlie the contrasting treatment of assets in the two dominant need analysis methodologies. FM relies on the principle that home equity and family farms are nonliquid assets, and that taxing them would require families to disrupt their lifestyles in unacceptable ways in order to finance college. It also assumes that families with low and moderate incomes either do not have significant assets—and therefore, there is little benefit to having those assets reported—or cannot afford to tap those assets because of their low current incomes. Simplification of the system might provide a strong argument for eliminating assets from the formula altogether, but the current partial treatment is not consistent with that logic.

Need analysis formulas that pay more attention to assets rest on the principle that assets and income contribute independently to financial strength. This approach, aside from its solid grounding in economic realities, eases the allocation of limited resources. When FM was modified to treat assets more generously, significant amounts of additional need were generated. Families previously ineligible for aid because of their home equity, for example, suddenly became eligible for large subsidies, although generally, only loans were available to meet this need. The modification to the methodology made it difficult for either the government or institutions to distinguish among families in quite different

circumstances in order to allocate the limited available funds, which were far from sufficient to meet all of the newly defined need.

A problem closely related to the differential treatment of different forms of assets is the way debt affects the system's measurement of assets. If a family uses a home equity loan, its assets decrease by the amount of the debt, so under Institutional Methodology, any expected contribution based on assets will decline. On the other hand, if they borrow in another way, say through a PLUS loan, their assets do not decrease and they are assessed as though they did not have debt. From an economic perspective, taxing net worth, rather than measuring assets but disregarding debt, would be logical and horizontally equitable. Using net worth as a basis for calculating expected contributions would require collecting the kind of information that is generally gathered on loan applications. The central objection to allowing nonmortgage debt to reduce taxable assets is that much of that debt results from consumer choices. Reducing EFCs for families and students with large credit card debt is obviously problematic. Reducing EFCs for those with existing education debt is more appealing, but the reality is that sources of debt and forms of expenditures are fungible and it is impossible to accurately distinguish between responsible debt and debt incurred to finance extravagant lifestyles. In other words, if the system allowed debt as a negative allowance against assets, allowing only certain debts—such as those specifically earmarked for education—would be problematic.

# Whose Assets Are Relevant?

The same questions that apply to the treatment of the incomes of various members of the household and family apply to the treatment of assets. Under the current system, parental assets are taxed at a maximum rate of 5.6 percent per year under FM and 5 percent under IM, while student assets are taxed at 35 percent and 25 percent, respectively. Again, the logic is that parents have other demands on their assets, while students should make paying for education their top priority.

It is widely recognized that the differential treatment of student and parent assets has created fertile ground for financial advisers. The ease of transferring assets from one family member to another interferes with the logical grounding for this need analysis provision. The difficulty of making a meaningful separation of the assets held by different family members also brings into question the FM practice of ignoring assets held in the names of siblings. The advent of state-sponsored dedicated education savings plans (discussed in College Savings Accounts and Prepaid Tuition Plans, page 81) has complicated this issue further, since these accounts are generally in the beneficiary's name but remain the property of the donor. If the assets of all family members were combined and taxed at one rate, the horizontal inequity based on the arbitrariness of the names on many savings vehicles would be eliminated.

# The Tax on Savings

One clear effect of the snapshot view on which the need analysis system has historically rested is that families who have chosen to save for college end up having to pay more than those who have not. The idea that assets increase ability to pay collides with the idea that families should be free to choose whether to save in advance, to cut deeply into current consumption, or to borrow. Two families with identical income histories should, according to principles of horizontal equity, be asked for identical contributions (at least if they are choosing equally priced educational options). But taxing frugal families' savings means that they will lose out on some financial aid.

There is, of course, no perfect answer to this dilemma. Financial aid professionals tend to focus on the fact that a family with \$10,000 of college savings will pay a maximum of \$560 more than a similar family with no savings. The family with the \$10,000 will have a much easier time financing their expected contribution and will, in the long run, be better off than the family that depends on borrowing and suffers the effects of compounding interest.

But there is a clear perception among the public that savers are chasing a moving target. Every dollar they save in an attempt to be prepared for the daunting expected contributions they face increases the amount colleges will expect them to contribute. Economists also complain about the savings disincentive in the need analysis system. The combined effects of income taxes and need analysis on the marginal tax rates on income and savings may discourage significant amounts of saving. While the maximum annual assessment rate on assets held by parents of dependent students is 5.6 percent in FM and 5 percent in IM,

when the assessment rate on the income generated by the asset is combined with federal and state income taxes, only about a third of the interest is likely to be available to devote to paying the EFC that would exist in the absence of savings. Moreover, the savings themselves are assessed every year. If 95 percent of the asset remains after the first year, and none of the asset is used to pay the expected contribution from income, 81 percent of the asset will remain after four years. If the savings are gradually depleted to pay for college, the amount available each year will be about 22 percent of the original amount saved, not 25 percent.

For students, the problem is even more serious because of the higher assessment rate on both income and assets. Student assets are assessed at 35 percent in FM and 25 percent in IM. A student who earns an extra \$1,000 over the summer and saves it for academic year expenses may be expected to contribute an additional \$500 out of income, plus an additional \$350 out of savings, based on the FM formula.

Clearly, there is a trade-off between reducing the savings disincentive in the need analysis system and recognizing the reality that assets increase ability to pay. The best solution is probably assuring that allowances against assets are adequate, so that assets that have been saved in order to finance expected contributions and will likely be used up entirely when those contributions are paid, do not increase the EFC. This problem is discussed further in the section on Allowances Against Assets, beginning on page 83.

# Home Equity

Federal Methodology does not consider home equity in determining expected family contributions. The logic for this is primarily political. During the 1980s, home prices in many parts of the country increased dramatically. For many homeowners, home equity skyrocketed, reaching levels totally out of proportion with incomes. This increase in net worth did not have any meaningful impact on consumption opportunities, since if they sold their houses to realize the capital gains, they would not be able to find cheaper housing without considerably diminishing their standards of living. Since the need analysis system taxed home equity like other assets, an increasing proportion of expected family contributions was attributable to assets, as opposed to income. Families with windfall profits on their homes had difficulty borrowing against their home equity because of limited cash flow. The problems created by these circumstances and the geographical inequities resulting from dramatic differences in housing prices across the country generated considerable political pressure among the middle class to modify the need analysis system.

The problem being addressed was a very real one, but the solution adopted by Congress was inconsistent with economic principles of both equity and efficiency. Choosing to ignore home equity entirely in the newly designed Federal Methodology of the 1992 Reauthorization created significant horizontal inequities, as well as making it difficult to distinguish among families in very different circumstances. While families with artificially inflated home equities might not have reasonably been expected to come up with the contributions prescribed by the old methodology, the new methodology totally ignored the reality that their assets gave

them considerable financial strength relative to non-homeowners, who did not benefit from the housing market inflation. The change also exacerbated the problem of treating assets differently depending on the form in which they are held.

Most private institutions relying on their own funds to meet the need of accepted candidates could not ignore home equity without creating huge gaps between measured need and available aid. Some schools continued to treat home equity as they always had—like any other asset. Others adopted a compromise approach, capping home value at three times annual income. This option in the IM formula has been modified somewhat. Since it is home equity, not home value, that drives the contribution, the option is to cap home equity at two times income. If a family purchased a home when their child was born, taking a mortgage equal to three times their income, they would still owe an amount approximately equal to their current income at the time the child reached college age. In order to remain consistent with rules of thumb in the banking industry, the family could borrow an additional amount up to twice their income in anticipation of college expenditures. Therefore, under this option, twice income is the maximum amount of home equity that is taxed.

The compromise approach recognizes both the fact that homeowners have greater ability to pay than renters with similar incomes and the reality that inflated home prices could generate expected contributions that families have difficulty financing. On the other hand, ignoring any part of home equity creates an inequity relative to families holding the same amount of assets in a form for which no special treatment is available in the need analysis system.

# Pension Assets

Assets held in pension or retirement accounts are not assessed by the need analysis system. The income tax code is purposely designed to encourage people to accumulate retirement assets; funds put into these assets are either tax-free until they are withdrawn or accumulate returns that are never taxed. But the need analysis system does not intend to create an added incentive for people to keep as large a proportion of their assets as possible in pension funds. When early need analysis formulas were devised, it was less common for retirement assets to be totally separate from other assets. As special savings vehicles have developed, both the difficulty of measuring and verifying holdings and the sense that these funds are earmarked for another purpose and thus not available for education expenses have prevented their inclusion in the system.

There is, however, no question that the existence of pension assets increases a family's ability to pay for college. Families with pension assets have less need to save than similar families without those assets and will be in a better position to repay debt in the future. Moreover, borrowing from pension assets, however unappealing, is an option families without those assets simply do not have. From an economic perspective, the form an asset takes is irrelevant. Therefore, a perfectly equitable need analysis system would accurately assess pension assets and tax them at a rate identical to the rate applied to other assets. This idea is based on the principle that the choices people make about the form in which to hold their assets should not affect assessment of their long-term financial capacity.

There are two basic types of retirement funds. Defined

contribution plans are similar to other savings vehicles. Contributions accumulate, and the owner of the fund receives information on the current value of the asset at regular intervals, as is the case with nonretirement assets. Defined benefit plans provided by employers, on the other hand, provide a specified level of annual income after retirement. It is more difficult to compare this type of pension holding to other assets.

In recent years, the proportion of pensions provided in the form of defined benefits has declined significantly. Because of this, the measurement problem relating to pension assets in evaluating ability to pay for college is less of an issue. In addition, defined benefit plans are generally closely tied to earnings levels and will not provide very high income levels. It is not infrequent, in contrast, for people to accumulate very large amounts of money in defined contribution plans. Moreover, recent tax law changes defined allowable educational expenses as qualified, nonpenalty withdrawals. For these reasons, it may be time to develop a reasonable way of including pension holdings in the measure of family ability to pay for college.

# College Savings Accounts and Prepaid Tuition Plans

Both the number of accounts and the amount of savings held in special savings plans, known as 529 plans, have grown rapidly in recent years. Some of these accounts are prepaid tuition plans, while others are standard financial funds. The existence of these tax-favored accounts adds a new complication for the assessment of assets in need analysis. While they are functionally similar to savings held in Uniform Gift to Minor accounts, these newer 529 savings plans technically remain the property of the donors—usually the parents or the grandparents of the student. Moreover, they are clearly earmarked for paying college costs, and penalties apply if the funds are used for other purposes.

The economic argument for taxing assets similarly regardless of the form in which they are held applies to these accounts as well as to any other savings vehicles. FM, however, currently takes a less rational approach. Funds withdrawn from prepaid tuition funds are considered student resources, reducing educational costs, and thus aid eligibility dollar for dollar. This treatment is obviously inefficient in an environment where encouraging families to save for college is a central goal. This treatment is also inequitable, since these savings are taxed more heavily than other assets, including those in standard 529 savings plans, which are treated as parental assets.

Institutional Methodology takes the more rational approach of treating all 529 plans, whether prepaid tuition plans or not, as parental assets in the case of dependent students, assessing them at the same rate as any other parental assets.

# Allowances Against Assets

## Asset Protection Allowance

Because sheltered retirement accounts were less common when need analysis methodologies were originally developed, an Asset Protection Allowance (APA), designed to protect some parental assets for retirement, was standard. Part of Uniform Methodology, the APA was integrated into Congressional Methodology and the College Board's Institutional Methodology. Although it has been eliminated from IM, it is present in its original form in FM.

The formula for the APA calculates the amount of assets which, if allowed to grow until the older parent reaches the age of 65, would generate the level of annual income sufficient, when added to the average expected Social Security benefit, to provide for the median living standard for people over the age of 65. This level of assets is excluded from taxation under the need analysis system.

Several questions can reasonably be raised about the APA. The most fundamental is the logic of protecting retirement assets at all. In addition to the fact that earmarked retirement savings are currently exempt from the need analysis system, the concept of the APA rests on the assumption that saving for retirement should be the first priority and that educational expenditures are reasonable only as a second priority. A society in which children are expected to provide for their parents in the later years of life would not make this assumption.

If the idea of an APA is accepted, the next question is whether the level of assets being protected is appropriate. The first issue is the income level considered requisite for retirement. The BLS intermediate living standard represents the average living standard of retired people. This is in contrast to the lower living standard, which is used to calculate the IPA. The logic behind this difference is that the IPA is not representative of a living standard, but of a level of income below which virtually no discretionary expenditures are possible. The income necessary for retirement, on the other hand, does represent an actual living standard. However, the reality is that because of the differential college attendance rates among young people from different family income backgrounds, the intermediate living standard is considerably lower than the expectations of most of those who send their children to college.

On the other hand, the logic of the APA suggests that the amount of assets protected may be too high for many families. This is because the income from the protected assets is calculated to supplement the *average* Social Security benefit. In fact, Social Security benefits are correlated with contributions to the system, which depend on earnings levels. Individuals with higher earnings pay higher Social Security taxes but also receive higher than average monthly benefits. Low wage earners, on the other hand, cannot expect to receive benefits as generous as the averages might suggest. Given the rationale underlying the APA, it would be more logical to have a system that allows low wage earners a higher asset protection allowance than they currently have, and high wage earners a lower APA. Those who can anticipate higher than average Social Security benefits will need lower supplemental income from their private assets to attain the median living standard, so the logic for giving them the standard APA is weak.

In fact, many families with incomes high enough to generate positive PCs and to have accumulated enough assets to benefit from the APA can expect Social Security benefits high enough to allow them to live at the prevailing living standard when they retire. Institutional Methodology eliminated the APA in 2000 because of the reality that a significant portion of the assets that families save

for retirement is not subject to taxation under the need analysis system. This is a logical approach, but might well be supplemented by some allowance against either income or assets for those who do not have any earmarked retirement savings.

### **Other IM Allowances Against Assets: Cumulative Educational Savings Allowance, Emergency Reserve Allowance, and Low Income Asset Allowance**

At the same time the APA was eliminated from Institutional Methodology, allowances against assets for education savings and emergency reserves were added. The Cumulative Education Savings Allowance (CESA) supplements the Annual Education Savings Allowance (AESA) against income to support the idea of families saving for college from the time their children are born. Both allowances are based on an annual savings goal, equal to 1.52 percent of total income up to a maximum of \$2,050 in 2004-05. This percentage represents the portion of income a family with an income high enough to have an EFC equal to the average cost of attendance at a 4-year private institution would have to save each year over 18 years to accumulate one-third of the four-year parent contribution from income. The CESA protects an amount of assets based on this level of savings over the lives of all students and younger children.

The Emergency Reserve Allowance (ERA) in IM is designed to protect assets families have in reserve for unforeseen contingencies. The formula is based on the idea that families are well-advised to have an amount equal to six months of basic expenditures set aside in case of emergency. The allowance is set at one-half of median family expenditures, adjusted for family size. For independent students without children, the allowance represents one month of median expenditures.

Finally, the Low Income Asset allowance in IM provides extra protection for families with very low incomes. If available income is a negative number but a family has positive net worth, an additional amount of assets equal to the negative available income is excluded from consideration in the calculation of the expected contribution from assets.



# Assessing Income and Assets

FM and IM take somewhat different approaches to generating an expected contribution that combines the amounts assessed from income and from assets. Either approach can be supported by economic logic. The FM formula adds 12 percent of available assets to available income for parents of dependent students and independent students with children. Marginal assessment rates are then applied to this income, which represents a combination of income and assets. Because these rates are progressive, with higher rates being applied at higher levels of income, the assessment rate applied to assets is higher for people with higher incomes than for people with lower incomes. The justification for this approach is that those with higher incomes can afford to deplete a greater proportion of their assets paying for college than can those with lower incomes, who will have more difficulty replenishing their savings. For dependent students and independent students without children, an amount equal to 35 percent of available assets is added to the contribution from income.

In Institutional Methodology, income and assets are assessed separately. One set of marginal assessment rates is applied to available income, while net parent assets are taxed at rates ranging from 3 to 5 percent. Those with larger assets are asked to contribute a greater proportion of their assets, regardless of their income levels. In this case, the logic is that those with minimal assets have a greater need to preserve those assets, regardless of

their income levels, while those with more ample assets can make greater proportional contributions from assets, regardless of their reported income levels.

# Marginal Assessment Rates

The need analysis system assesses available income based on a graduated rate schedule that begins at 22 percent and goes up to 47 percent in FM and to 46 percent in IM. This is the marginal rate applied to extra dollars of income until the next higher bracket is reached. It is not the overall assessment rate on income. If the marginal rate is 22 percent and an aid applicant's income exceeds the allowances against income by \$100, she will be asked to contribute \$22. The lowest marginal rate applies to the first dollars of available income for all applicants, with extra dollars of income being assessed at progressively higher rates. Economists focus on marginal tax rates quite a bit because even though they seem to exaggerate tax burdens, they are, as discussed in Part I, the basis of the potential negative incentive effects of taxation. People generally make decisions about working and spending at the margin. Choosing to reduce one's income to zero to avoid taxes altogether is unlikely. But if a worker is deciding whether to take a few hours of overtime or not, the question of what portion of the extra wages he will be able to keep after taxes can be quite significant. If the marginal tax rate is high, he may decide it's not worth the effort.

One way in which the marginal assessment rates in the need analysis system might have a significant effect is on a family's second earner. Considerable empirical evidence confirms that in the economy as a whole, married women's labor supply is most sensitive to changes in marginal income tax rates. A second earner

may be in the situation of facing a 47 percent assessment rate through the need analysis system on the first dollar earned after federal and state income taxes. Why get a job when the financial aid for your child will fall by almost 50 percent of your after-tax earnings? The marginal assessment rate on student income—50 percent in FM; 50 percent for dependent students and 70 percent for independent students in IM—creates an even more serious work disincentive. Although high marginal rates may be appealing because people with large amounts of discretionary income should be willing to spend a large portion of it on their own or their children's education, the negative incentive effects must be considered in determining the appropriate assessment rate schedule.

While the marginal rate schedule incorporated in the need analysis system is a critical determinant of expected contribution levels, it is perhaps the most difficult component of the system for which to construct a logical argument based on economic principles. There is a long-standing debate within the economics profession about the justification for progressive taxation. A progressive tax is defined as one under which higher income people pay a higher percentage of their incomes in taxes. This is in contrast to a proportional tax, which taxes everyone at the same rate, and a regressive tax, under which income and the overall tax rates are inversely related. While it is intuitively pleasing to believe that wealthier people can give up a larger percentage of their incomes without undue suffering, there is really no way to quantify the sacrifices made by different people or to equalize burdens. Economists have not found a resolution to this quandary. Nonetheless, there is a general consensus that progressive taxation is more equitable than proportional taxation, that asking someone who earns \$80,000 a year to contribute \$12,000 is less onerous than asking someone who makes \$40,000 a year to contribute \$6,000. It is quite reasonable that the need analysis system rests on similarly subjective principles.

The argument that the assessment rates should be progressive is, while not airtight, quite convincing. But the argument for

any specific set of rates is much more tenuous. The current FM assessment rate structure has been in existence for many years, originating with Uniform Methodology and carrying over into congressional, federal, and early versions of Institutional Methodology. Institutional Methodology assessment rates have been modified to add more income bands and to broaden those bands, increasing the levels of income at which the higher marginal assessment rates set in. A debate about the appropriate assessment rate schedule for the need analysis system is not so much about whether or not it should be progressive, but about how progressive it should be.

Many discussions about the appropriateness of the current need analysis system focus on the assessment rate schedule, in the sense that they are concerned with whether the contributions expected at different income levels are too high, too low, or about right. While there may be some exemptions to income or assets that would differentially affect families and individuals at different income levels, the best way to adjust these relative burdens is through the marginal assessment rate schedule. While there is no right answer to what the optimal rates would be, there are several ways of looking at the schedule that may be useful.

**1)** The income level at which the lowest marginal rate sets in can be modified. Raising this zero bracket amount would lower overall assessment rates on all aid applicants, since everyone would have more exempt income. It would, however, have a proportionately larger impact on people at lower income levels. Suppose, for example, that the IPA were increased by \$2,000, to \$23,070 from the 2004-05 FM level of \$21,050. This would mean that all expected contributions would fall by 22 percent of \$2,000, or \$440, since everyone currently faces this rate on the first \$2,000 of AAI. The effect on applicants with incomes reaching into higher marginal brackets would be greater than this, since portions of income would move down into lower brackets. The proportional decline in PCs would, however, be greater at lower income levels.

**2)** The income brackets to which each of the assessment rates applies can be widened. Under FM, each rate applies to

the relatively small amount of about \$3,100. This means that the marginal assessment rate increases rapidly, with families with total incomes of about \$50,000–\$60,000 falling into the highest marginal bracket. Wider income bands reduce contributions for all applicants by reducing the amount of income subject to the higher marginal rates.

**3)** The rates could be modified. There is no particular reason why the rates should range from 22 percent to 46 percent or 47 percent. Changing the rates can be an effective way of redistributing the expected contribution burdens. Modifications of the rates could take a variety of forms and evaluating them is really a matter of individual judgment. For example, more rates could be added so that the marginal assessment rate would increase more gradually or the lowest rate could be increased, say to 25 percent or 30 percent in order to generate higher expected contributions for those with small amounts of AAI.

One caveat based on economic analysis relates to the question of how high the top marginal rate should be. Aid professionals frequently argue that it would be reasonable to raise the highest marginal rate if it were to take effect at an income level higher than the ones at which the 46 percent and 47 percent rates currently set in. Despite the logic of this argument, based on making education the first priority, it is important to remember that the need analysis assessment rate comes on top of personal income tax and payroll tax rates. The negative incentive effects of high marginal rates discussed at the beginning of this section dictate caution in this regard.

Incentive effects are also relevant for independent and dependent student earnings assessment rates. The current marginal rates of 50 percent and 70 percent on the after-tax incomes of students probably discourage some students from working to earn more than the income protection allowance in FM or the amount that generates the minimum student contribution required by some schools using IM to allocate their own funds. It is understandable that some professional schools choose to apply even higher marginal assessment rates to the incomes of

independent students whose future income prospects are very promising. Nonetheless, this practice is likely to significantly diminish student work effort.



# Conclusion

An understanding of basic economic principles and of the economic theory relevant to need analysis cannot solve all of the difficult problems involved in the equitable and efficient allocation of limited student aid funds. But it can provide a framework for making decisions on campuses and for evaluating proposals for modification of the need analysis system. Although reasonable people will always disagree about the details of the methodology, a shared knowledge of the underlying assumptions and the likely effects of various practices should raise the level of the debate from personal opinion to informed analysis.

The details discussed in this *Primer* are part of a complex need analysis system. Much of the complexity results from attempts to make the formula more equitable. But the very complexity of both the formulas and the aid application process may, unfortunately, deter students with financial need from going through the process, and thus from going to college. Increasing the simplicity and predictability of the aid system without unduly sacrificing equity

should be a high priority. To this end, it is important to distinguish between elements of the formula that are visible to the applicant and lead to frustration, and those that have complex derivations or involve careful computation on the part of the government, the institution, or any other entity awarding aid, but do not create undue complexity for applicants. For example, the Asset Protection Allowance is based on a complicated formula understood by few people who use it. But the resulting table is not difficult to understand or communicate. It may also be appropriate to think separately about the formula used to allocate federal grants to low-income students and the formula used by institutions to supplement these funds and allow institutional choice among students with more complex financial situations. Need analysis provisions that may unnecessarily complicate the application process and the transparency and predictability of public subsidies for low-income students are frequently necessary components of a methodology designed to equitably distribute limited institutional dollars to middle- and upper-middle-income students.

The methodology used to allocate need-based aid becomes even more critical as the lines between need-based and non-need-based aid are blurred and as institutions find themselves manipulating their evaluation of individual applicants to meet enrollment goals. Aid professionals who have the theoretical tools to evaluate the foundation and the specific elements of need analysis will be in a much better position to defend the system than will those who must rely on the general notion that it is “fair.” The concepts presented in this *Primer* should open the door to more complete analysis of the entire aid system and its relationship to the future of higher education opportunities.

# Author Biography

**Sandy Baum** is professor of economics at Skidmore College and a senior policy analyst at the College Board. She has written extensively on issues related to college access, college pricing, student aid policy, student debt, affordability, and other aspects of higher education finance. Dr. Baum manages the research and production of the *Trends in Student Aid* and *Trends in College Pricing* publications for the College Board. She authored a 2001 College Board monograph entitled *Higher Education Dollars and Sense: A Framework for Campus Discussions*, and the 2003 Nellie Mae study of student borrowers and repayment. She has advised the College Board's Financial Aid Standards and Services Advisory Committee (FASSAC) since 1988 and has worked with a variety of organizations concerned about higher education finance, including the National Association of Student Financial Aid Administrators (NASFAA) and the Pathways to College Network. Dr. Baum earned her bachelor's degree from Bryn Mawr College and her doctorate from Columbia University.



