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TOWARDS A THEORY OF THE EDUCATIONAL FIRM.

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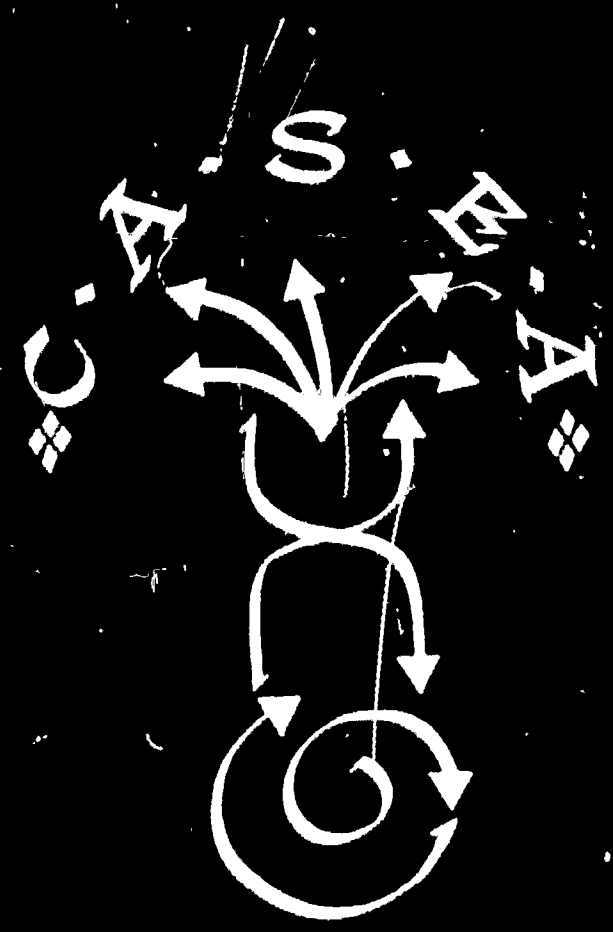
THIS PAPER DEVELOPS AN ECONOMIC THEORY OF INSTITUTIONS OF HIGHER EDUCATION (IHE) FROM WHICH IT MIGHT BE POSSIBLE TO EXTRACT A THEORY OF ENROLLMENT SUPPLY. SUCH A THEORY MUST DIFFER RADICALLY FROM THE THEORY OF THE BUSINESS FIRM BECAUSE OF TWO KEY ASSUMPTIONS WHICH CANNOT BE MADE ABOUT THE IHE--PROFIT MAXIMIZATION AND A PRODUCTION FUNCTION WHICH FORCES UPON THE FIRM A CONDITION OF RISING MARGINAL COST. THEREFORE, AN ALTERNATIVE APPROACH TO DESCRIBE THE "MODUS OPERANDI" FOR THE IHE IS DEVELOPED. TWO APPROACHES ARE TRIED USING A RULE-OF-THUMB BEHAVIOR ASSUMPTION AND AN OUTLAY MAXIMIZATION ASSUMPTION, BUT NEITHER PRODUCES SATISFACTORY RESULTS. COMBINATION OF THE TWO PRODUCES SATISFACTORY RESULTS. THIS COMPROMISE IS EMBODIED IN THE UTILITY FUNCTION--U = V(OUTLAYS, ENROLLMENT). FROM THIS UTILITY FUNCTION, A SUPPLY FUNCTION FOR THE IHE IS DERIVED. USING THIS SUPPLY FUNCTION AND A LINEAR DEMAND FUNCTION, NONPRICE RATIONING, THE ECONOMICS OF SCHOLARSHIPS, AND IMPLICATIONS OF PRICE CONTROL ARE DISCUSSED. THIS PAPER WAS PRESENTED TO THE ANNUAL MEETING OF THE WESTERN ECONOMIC ASSOCIATION (BERKELEY, CALIFORNIA, AUGUST, 1966), AND IS ALSO AVAILABLE FOR $0.25 FROM PUBLICATIONS DEPARTMENT, CENTER FOR THE ADVANCED STUDY OF EDUCATIONAL ADMINISTRATION, HENDRICKS HALL, UNIVERSITY OF OREGON, EUGENE, OREGON 97403. (HW)



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TOWARDS A THEORY OF THE EDUCATIONAL FIRM

Barry N. Siegel*

In an earlier paper,[1] Robert Campbell and I found it possible to estimate for higher education an empirical enrollment demand function using such garden variety variables as real disposable family income and tuition and fees corrected for changes in consumer prices. An empirical enrollment demand function can be interpreted in terms of an existing theory of educational demand. When we move to the supply side, however, there does not appear to be such a theory. That is, even if we were empirically to derive an association between price charged (tuition and fees) and quantity offered (enrollments), we would have no theory of the educational firm to help us interpret the finding.

It is the purpose of this paper to develop an economic theory of institutions of higher education (IHE) from which it might be possible to extract a theory of enrollment supply. Such a theory must differ radically

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[1] "The Demand for Higher Education in the United States, 1919-1964," forthcoming in the American Economic Review.

from the theory of the business firm. The latter is built upon two key assumptions: profit maximization and a production function which forces upon the firm a condition of rising marginal costs. A positively sloped supply curve for a business firm is the logical outcome of these two assumptions. Remove either of them and you will have destroyed the theory of rising supply price, at least insofar as the latter is based upon the customary theory of the firm. Unfortunately, this is exactly what we must do when we come to the institutions of higher education. Profit maximization will not work as a behavioral assumption, and we would be hard put to describe for it a meaningful production function. What we must do is find some alternative apparatus to describe the modus operandi for the IHE and hope that a supply function will emerge from it.

The approach here will be through the theory of choice. That is, we shall assume that an IHE is dominated by an institutional utility function and that, subject to certain constraints, the IHE attempts to maximize its utility. The approach is strongly reminiscent of the one used by Oliver Williamson in his work

on the theory of the firm,[2] except that is is applied to public and semi-public institutions rather than to private business firms.

Revenue and Outlay Identities and Statement of Problem

Institutions of higher education can be classified according to whether they do or do not have control over price (tuition and fee levels) and/or admissions. We begin with the case in which internal control exists and in which it is freely exercised. Let such an institution face a linear average revenue function (P is tuition and E is enrollment):

$$(1)\quad E = a - bP$$

Let it also receive grants, subsidies, and endowment income in the amount G. Given G, total revenue (R) varies with enrollment:

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[2]The Economics of Discretionary Behavior: Managerial Objectives in a Theory of the Firm (Englewood Cliffs: Prentice-Hall, Inc., 1964). For an interesting discussion of this genre of literature, see A. A. Alchian, "The Basis of Some Recent Advances in the Theory of the Firm," The Journal of Industrial Economics, Vol. XXV, No. 1, November, 1965. The literature is also surveyed in short monograph by Harold L. Johnson, Graphic Analysis of Multiple Goal Firms: Current Status and Critique (Center for Research, College of Business Administration, Pennsylvania State University, Occasional Paper #5, April 1966).

(2) $P \cdot E + G = R$.[3]

The situation is exhibited in figures 1a and 1b, showing the demand curve in 1a and the total revenue function in 1b. I shall call the total revenue function the institutional opportunity locus, L. I do this because L defines the boundary of a set of opportunities facing the institution. For, suppose the IHE must so operate its affairs that it may never run a deficit. Since this means it may never spend more than R, the institution will always be constrained to outlays equal to or less than R. In the figure, the IHE's activities will be confined to some point on or below a function like L_1 or L_2. To select a point (say H), the IHE must also select a price-enrollment point on Da in figure 1a (P_1 and E_1).

Our problem is to find the principle by which a point such as H is selected. Before we try, however, note the following properties of L. Its peak corresponds

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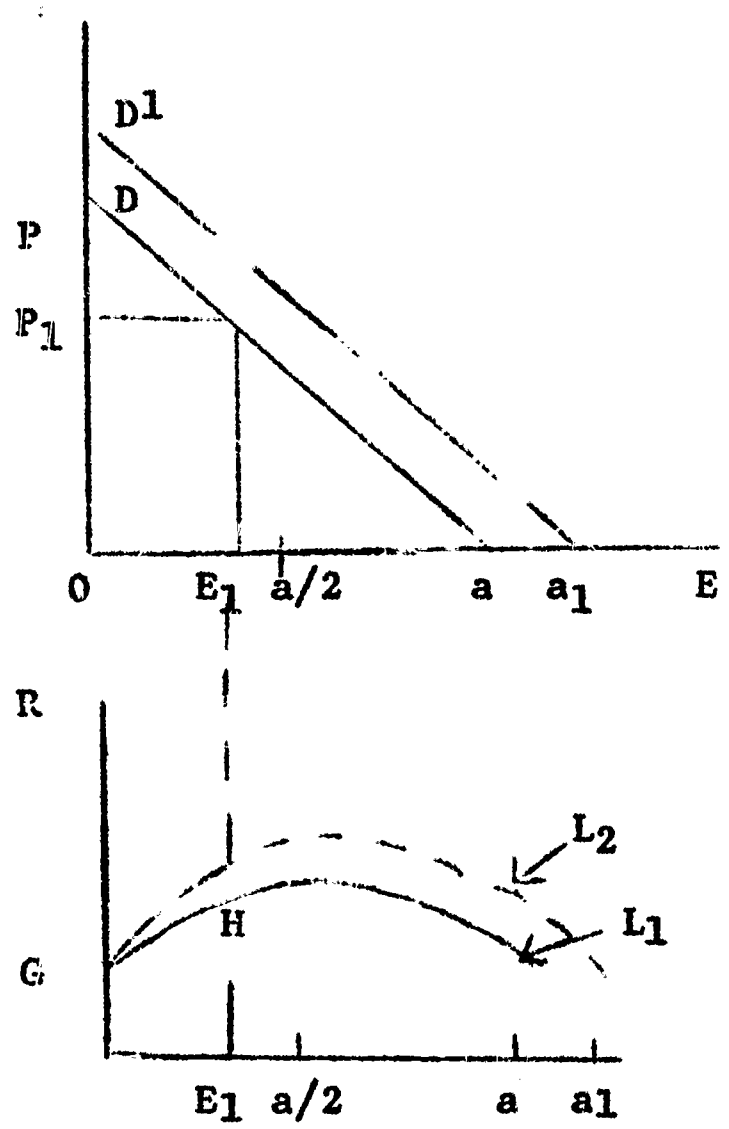
[3]In public institutions, particularly, G may well be a function of E, since legislatures often authorize institutional subsidies on the basis of enrollment levels. Suppose a simple rule to be followed, such as $G = G_o + g\,E$, where G_o is a basic subsidy, and g is a variable subsidy per student. This would change the revenue equation to: (2a) $R = P \cdot E + G_o + gE$, or substituting (1) into (2a) we get (2b): $R = G_o + (a/b + g)E - \frac{E^2}{b}$.

to a point on the average revenue curve where the elasticity of that curve is unity. Given that Da is a straight line, this point is where E = a/2.[4] An increase in demand shifts the opportunity locus from L_1 to L_2, stretch-

Figure 1a and 1b



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[4]If equation (2b), footnote 3, is the total revenue function, L reaches a maximum at E = 1/2 (gb+a). Making G depend on E therefore simply stretches L to the right; it does not change the basic problem, which is to find some principle upon which the pricing decision is to be made.

ing it out and up, displacing the peak revenue point to the right. L shifts vertically with variations in G.

The IHE's total outlays (O) may be split into instructional and noninstructional outlays. The former depends on the number of faculty (F) and upon their average salary (W). Noninstructional outlays include a variety of items, such as library expenditures, administrative costs, equipment and other capital outlays, maintenance costs, etc. Call this latter category A, and form the outlay identity:

$$(3)\quad W \cdot F + A = O.$$

Rule of Thumb Behavior

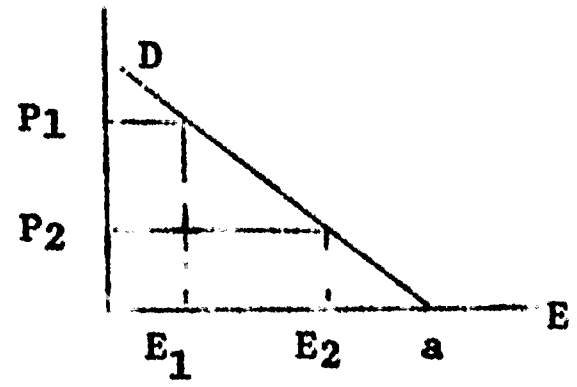
It is common practice in educational circles to assume the existence of some relationship between faculty and enrollment, i.e., a faculty enrollment ratio (f). It is also common to think of some relationship between at least some part of A and enrollment. I shall momentarily argue against such assumptions, but let us make them, for the present. The outlay identity thus becomes an outlay function:

$$(4)\quad O = (Wf + h)\, E + A_o,$$

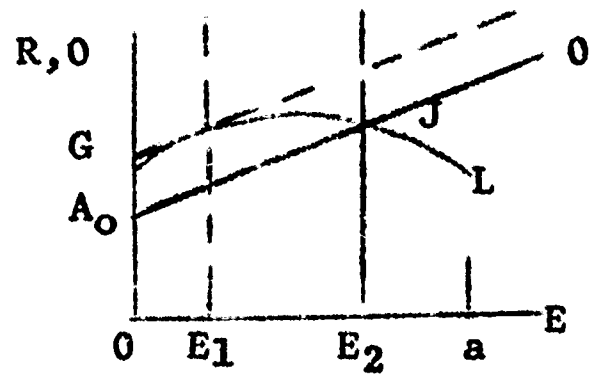
where $A = A_o + h\, E$.

If (4) is superimposed on the opportunity locus, we get figures 2a and 2b.

Figures 2a and 2b



2a



This diagram reveals the ambiguity of the present formulation. If the IHE were a profit maximizing firm, it would settle at an enrollment-price combination of E_1 and P_1. But, profit maximization makes no sense for these institutions as they are presently operated. Indeed, one would expect the IHE to operate at a point of budget balance--say J in the figure. Point J would give an enrollment-price combination of E_2 and P_2; but, this combination is not necessarily a preferred one. Budget

balance may be achieved anywhere on L. Point J only looks unique. If we were to assume different values for A_o, f, and h in equation (4), our outlay function would cross L at a different point. There is no "production function" relating either F or A to E. The "constants" A_o, f, and h are purely arbitrary, a result of assumed rule-of-thumb behavior, and there is nothing to prevent us from giving them a different set of values. It is only required that any resulting combination of A, W., and F satisfy the budget constraint.

Outlay Maximization

What is to be done? The approach favored here is to form a relevant utility function for the IHE and maximize it subject to the constraint defined by the opportunity locus, L.

One possible form of the utility function is:

(5) $U = u$ (outlays),

where $u' > o$ for all levels of outlay. An IHE possessing such a function would be a revenue maximizer,[5] since

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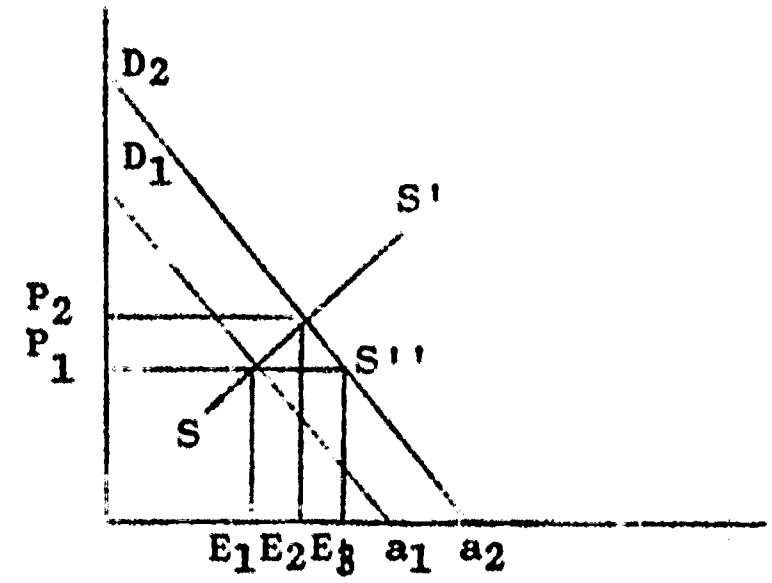
[5]If we had a minimum profit rate as a constraint, this case would look like W. Baumol's sales maximization hypothesis. See his Business Behavior, Value and Growth (New York: Macmillan, 1959), Part I.

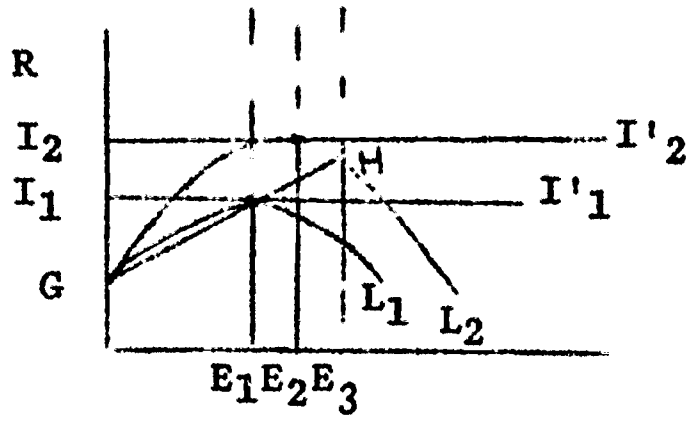
outlays are maximized only when revenues are maximized. The price-enrollment behavior of such an institution would be extremely simple: Price would always be set at a level which yields maximum total revenue, i.e., at a point where $E_1 = a_1/2$ in figures 3a and 3b. The IHE enrollment supply function would be the locus of prices and enrollments at which demand elasticity is unity. Nothing short of legislation would alter this supply function. It is uninfluenced by technology, grants and subsidies, wage levels, or any other input cost. The situation is depicted on figures 3a and 3b, where S S' is the supply curve and the lines labeled I I' are indifference curves.

Suppose we were to subject an outlay maximizing IHE to price control--not an unfamiliar phenomenon in public institutions. If a maximum price is set at P_1, each L function becomes a straight line (GH) up to the E associated with P_1, after which it resumes its former shape. With a horizontal indifference map, the IHE would always expand enrollments to a point like H in figure 3b, meaning that the enrollment supply would always extend the full distance to the highest demand curve at the regulated price, e.g., P_1S''.

Figures 3a and 3b



3a



3b

It appears, then, that an outlay maximizing IHE never indulges in nonprice rationing of enrollments. Moreover, it is not vitally concerned with the quality of its program, insofar as quality is affected by the level of enrollment. Having accepted the enrollment level dictated by its revenue maximizing goal, the IHE is then constrained to work on the qualitative aspects of its program within the limits provided by the enrollment

level it finds itself with. An outlay maximizing IHE is evidentally not a widely distributed case.

An Alternative Solution

A compromise between rule-of-thumb behavior and outlay maximization is in order. Such a compromise is embodied in the utility function expressed in equation (6):

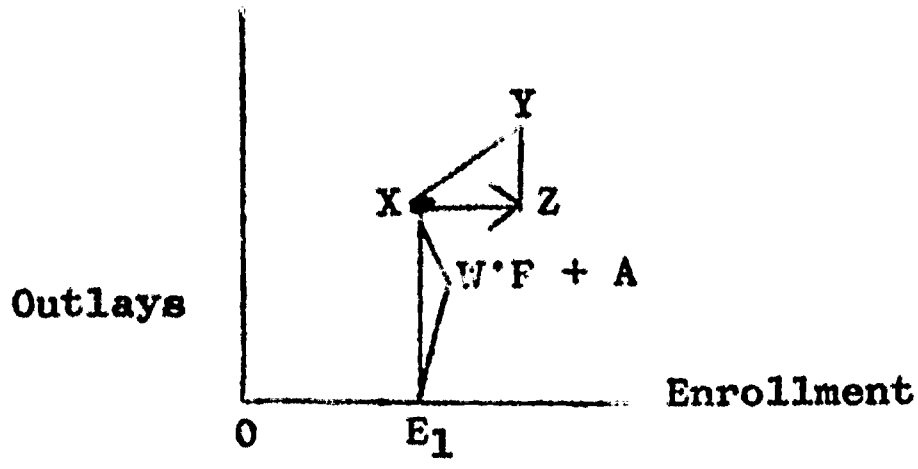
(6) $U = V(\text{outlays, enrollment});\ V'_1 > 0,\ V'_2 < 0.$

The rationalization for such a function is as follows:

Consider an IHE constrained to point X in the outlay-enrollment space of figure 4. Point X is associated with a certain level of expenditures upon instructional and noninstructional items. Presumably, the institution will allocate its expenditures in a way which best satisfies its research and teaching goals within the constraint provided by the available funds. Given an enrollment of E_1, this allocation will imply a certain load on the faculty and a certain load on the administration, library, equipment, etc. Each of these loads will lead to an appraisal by the administration of the overall quality of the program.

Now consider an enrollment expansion of XZ, with

Figure 4



total outlays held constant at E_1X. Will the IHE administration be indifferent as between point X and Z? The answer depends upon the administration's estimate of the impact of the enrollment expansion on the quality of its program. If it sees no quality impairment, point Z will be as good as point X: V'_2, the marginal utility of enrollment, will be zero.[6] But, suppose, for example, that the enrollment expansion imposes extra administrative costs. If these are met by a reduction in instructional outlays, the faculty-student ratio will fall. Aside from the effect of such a fall on the administration's appraisal of its program, the decrease

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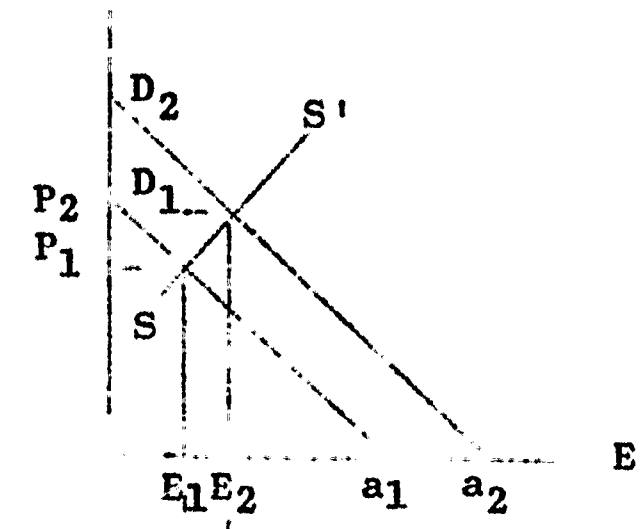
[6]Here the present argument collapses to the revenue maximization case.

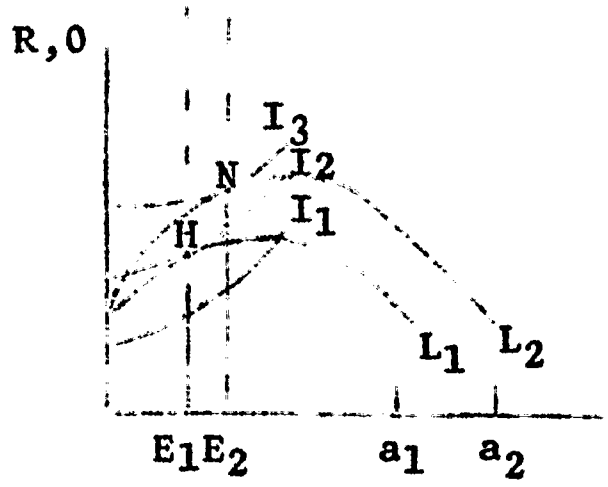
in the ratio may also reduce the institution's attractiveness to faculty and force it to raise its wage rates in order to retain and attract the quality of faculty it desires. If the average faculty load is held constant, the additional student load must be financed from research funds, library allocations, or other areas which may damage the quality of the institution. In sum, if $V'_2 < 0$, a constant level of satisfaction can be attained with enrollment expansion only by compensating the institution with (say) ZY dollars. Points X and Y will both be on the same indifference curve and the curve will have a positive slope.

The utility function described in equation (6) is indicated in figure 5b with a series of ⌒ shaped indifference curves. These curves are drawn on the assumption that the marginal rate of substitution of funds for students is an increasing function of enrollment. Since higher indifference curves reflect higher levels of satisfaction, we should expect an IHE to optimize its position by choosing a point on a given locus which is also the point touching the highest indifference curve of all which touch the locus. This point, (M in the figure) sets the enrollment level

Figures 5a and 5b



5a



5b

(at E_1) and the tuition level (at P_1).

There are several things to note about this solution. First, if the indifference curves have positive slopes, an optimum always occurs before the point of maximum revenue: price is always associated with an enrollment level yielding positive marginal revenue.

Second, price depends heavily on the level of the institutional utility function. Consider the budget

identity for the IHE at P_1 and E_1. Let G_1 be its grants, A_1 its noninstructional outlays, F_1 its faculty size, and W_1 the average faculty wage rate. From the budget identity it follows that:

$$(7) \quad P_1 = W_1\left(\frac{F_1}{E_1}\right) + \left(\frac{A_1}{E_1}\right) - \left(\frac{G_1}{E_1}\right)$$

The first and second terms in (7) reflect the allocation of outlays for instructional and noninstructional purposes for the enrollment level E_1. Suppose now that the administration suddenly decides the faculty-student ratio is too low for this enrollment level. Given W_1 and G_1, the administration has only a few choices. If it lowers A below A_1, it will find itself with fewer noninstructional resources per student. If the IHE finds this to be acceptable, the change in tastes has no effect upon price and enrollment policy. But, if the institution does not wish to reduce unit noninstructional outlays below (A_1/E_1), it must raise the price of its enrollments. This choice, which would be reflected in figure 5b by a counterclockwise rotation of the indifference curve system, will give the institution both a higher faculty-student ratio and a higher level of <u>unit</u> noninstructional outlays.

The effect on price of changes in grants and subsidies depends on the shape of the preference system of the administration. An increase in grants will produce a vertical shift in the opportunity locus. If the indifference curves drift up and to the right, as in figure 5b, the increase in grants will lead to a reduction in price and an expansion in enrollments. If the indifference curves are vertically arrayed, we have the interesting case of price insensitivity in the face of expanding grants and subsidies. The institution simply indulges itself in higher faculty-student ratios and/or more noninstructional outlays per student.

Finally, we must note the effect on price of changes in faculty wages. As equation (7) indicates, the institution cannot continue to maintain the price P_1 unless it is willing either to reduce F below F_1 or to reduce A below A_1. Presumably it will not be willing to do either of these things without a reduction in enrollment, since by assumption F_1 and A_1 are optimal at E_1. Provided that it wishes to maintain the average quality of its faculty, the institution will be led to reduce enrollment and raise its price. In figure 5b the wage

increase will produce a counterclockwise rotation of the indifference curve system.

In sum, apart from shifts in demand, price depends upon the properties of the IHE's utility function, the level of the faculty wage rate, and, except in the special case of vertically stacked indifference curves, upon the amount of grant and subsidy income.

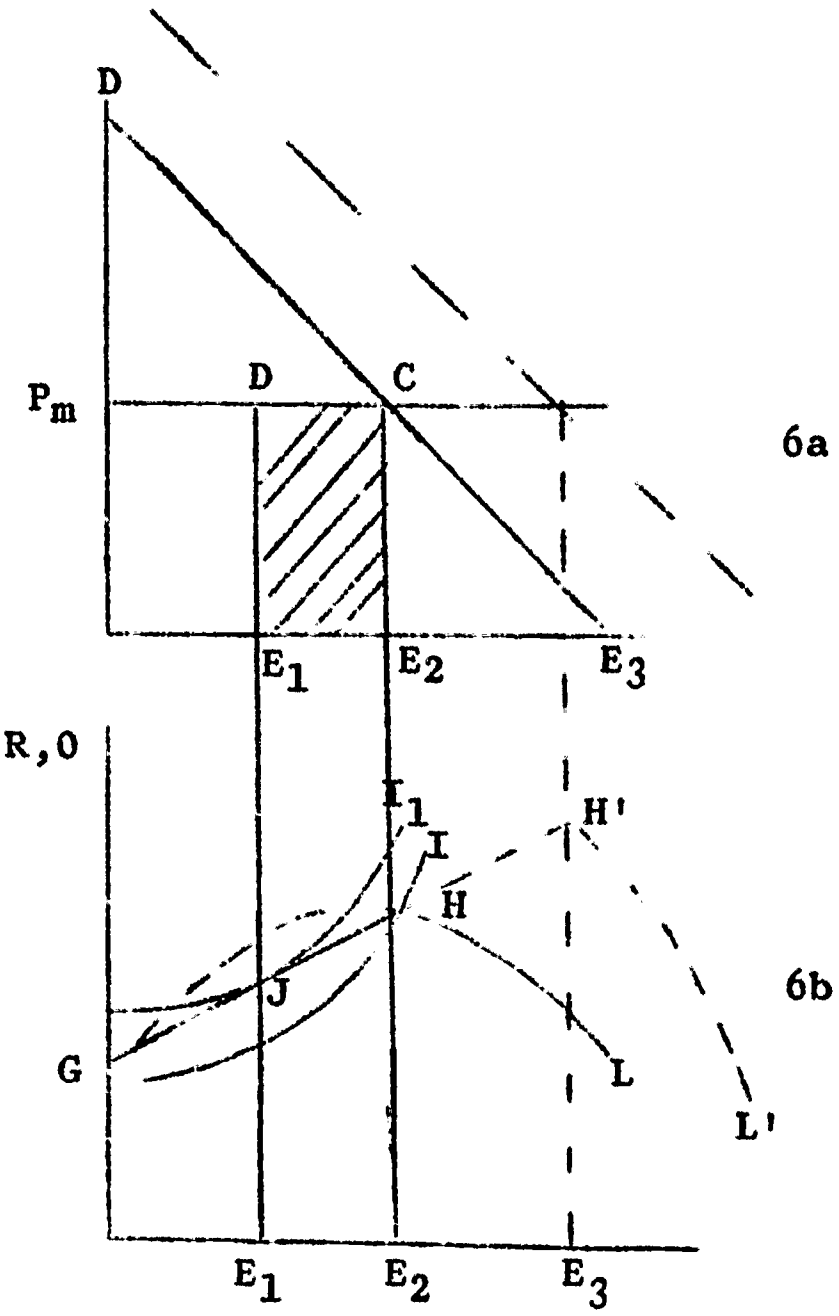
It is now a small step to the notion of an institutional supply function. A shift in demand to D_2 a_2 in figure 5a will produce a shift in the opportunity locus to L_2 in figure 5b. With the aid of the preference map it is now possible to find a new optimum at point N, hence also a new price-enrollment combination at P_2 and E_2. The slope of SS' depends crucially upon the shape of the preference map. Indifference curves which are steep, and which do not drift very much to the right as the level of utility rises, will produce steep enrollment supply functions, and vice-versa. The level of the supply function depends upon the factors discussed in connection with the level of any given price.

Nonprice Rationing

The test of any model is its usefulness as an explanatory device. The model of the previous section has already been used to construct a supply function and to discuss some of the factors leading to changes in both the price and enrollment policies of institutions of higher education which are able to use price policy as an instrument to pursue institutional goals. In this section we shall be interested in the consequences of price control. Many public institutions practice such control both out of public spiritedness and because of pressure from authorities to keep the price of a college education within reach of the common man. The same considerations motivate many private institutions to keep prices down.

The situation is portrayed in figures 6a and 6b. A maximum price, P_m, causes the opportunity locus in 6b to take the shape indicated by the function labeled GHL. If the IHE were to accept all students who wished to enroll at P_m, it would find itself at point H. Point H, however, is inferior to point J, which is also on the opportunity locus. In order to reach point J the institution must indulge in nonprice rationing of

Figures 6a and 6b



some sort. As a result, the institution will find itself with a price-enrollment combination off of its demand curve: point D in figure 6a. Note that non-price rationing costs the institution something: E_1DCE_2 in the figure.

Now, imagine a shift in demand as shown by the

dotted demand curve in figure 6a. If the maximum price holds at P_m, the opportunity locus will change to GH'L' in figure 6b. In this situation, where grant or subsidy income remains unchanged, the institutional response will be solely in the form of further nonprice rationing, a further tighening of standards. If we had assumed an expansion of grant or subsidy income, of course, our result would have been different. An increase in G causes a vertical shift in the opportunity locus. If the preference map is "normal"--that is, if it drifts to the right as the level of utility rises--the impact of demand on nonprice rationing will be offset by the rising level of subsidy.

This discussion points to a useful distinction between what might be called induced changes in standards and autonomous changes in standards. Induced changes are those which, in the context of price control, arise from a lag of grant or subsidy income behind increases in enrollment demand. Autonomous changes in standards arise from factors which rotate the indifference curve system. It is a common observation that standards in American higher education have been rapidly improving in recent years. The improvement has reflected itself

in higher admissions standards in many institutions and, perhaps, in tougher performance standards. It would be interesting to know how much of this purported improvement in standards has been induced and how much is of the autonomous variety. Certainly, the environment for both has been present. The vast sums of federal research money now available in many fields of study must surely have encouraged a change in tastes--a counterclockwise rotation of indifference curves--in many institutions. If so, much of the observed improvement of standards may have been a reflection of institutions' unwillingness to raise price and of the failure of governments to provide the increased subsidies made necessary by the change in tastes, except, of course, insofar as these subsidies have been used by the receiving institutions to finance their instructional programs.

In addition to this situation, there has been enormous pressure upon educational facilities from the demand side. Some of this pressure has been met by increased subsidization, some by increases in tuitions and fees, and some by a raising of standards. The point here is that further pressure on both prices and standards has probably emanated from factors which have en-

couraged a change in tastes of a large number of institutions of higher education. One of the effects of this dual set of forces has been the rapid development of new four-year colleges and of junior and community colleges. Many of these institutions have been designed to deal with the spillover of students who have been unable to meet either the price or the standards of older four-year institutions.[7]

The Economics of Scholarships--The Principle of Joint Subsidy

In recent years there has been a great expansion in scholarship and loan programs, particularly by the federal government. In addition, banks and other financial institutions have been expanding their activities in the field of educational lending. The probable effect of these changes has been to accelerate the growth in enrollment demand. Indeed, this has been the purpose of

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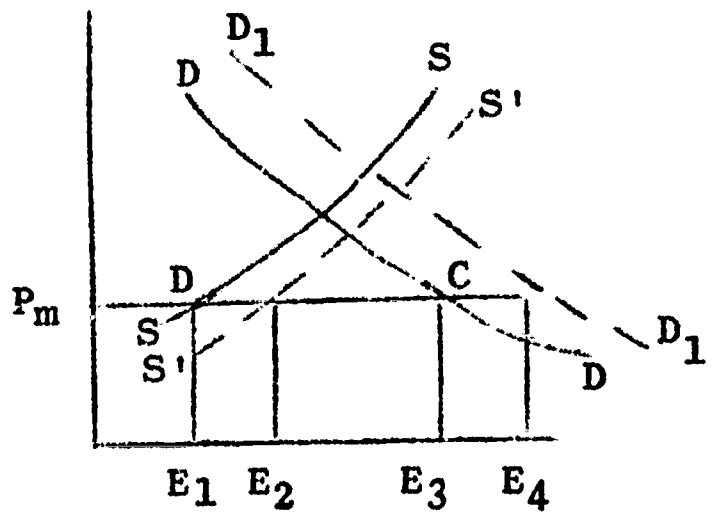
[7]The newer institutions are subject to the same forces as the older ones. A lag of grant or subsidy income behind enrollment demand may also force them to improve their standards and become more like the institutions they were designed to complement. Some of the schools in the California State College System have evolved rapidly in this direction in recent years.

the federal programs. What does our model say about the conditions necessary for success in these programs?

First, it should be apparent that an increase in demand does not necessarily produce an increase in enrollments. If institutions of higher education pursue fixed price policies, the increase in demand may be simply met by induced improvements in standards. If so, the federal programs will raise student quality rather than student numbers. Second, institutions may respond to the increase in demand by raising their prices, but since prices are usually initially set below their equilibrium levels, the increase in enrollment depends upon the slope of the institutional supply function, not upon the demand curve. The supply curve may be steep enough to prevent enrollment from rising in proportion to the increase in demand. If federal programs are to have their full impact upon enrollments, then, one of two things may have to occur. Either an autonomous deterioration in standards must take place, or subsidies to students must be accompanied by subsidies to institutions. It hardly need be stated that in today's environment a deterioration in standards is not a serious possibility.

There is a principle lurking in this discussion--what we might call the principle of joint subsidy. Assume that at any moment of time there exists an excess demand for enrollments, as measured in figure 7 by the horizontal distance DC. Given its utility function, a certain level of grant, subsidy, and endowment income and a maximum price of P_m, an IHE will be in equilibrium with an enrollment of E_1. The institution will be applying a set of standards which exactly rations enrollment to E_1 rather than to the level of E_3, which is the desired or equilibrium level of enrollment from the students' point of view. Now, assume a program of subsidies to students which has as its goal a certain

Figure 7



increase in actual enrollments. These subsidies will shift the enrollment demand curve, but, so long as P_m remains, enrollments will remain fixed at E_1. A subsidy to the institution which shifts the supply curve is necessary before the student subsidies can take effect. As should be clear from the figure, a rise in price above P_m would reduce the need for the additional subsidy to the institution.

Figure 7 raises another issue. If the purpose of national policy is simply to raise enrollments, is a policy of student subsidies necessary? After all, to raise enrollments from E_1 to E_2 in the diagram is it not necessary only to subsidize the institution? The answer depends very much on the possibility of inducing a deterioration of standards in the institution. If standards are flexible upwards but inflexible downwards, a simple policy of institutional subsidy will not work. A movement from E_1 to E_2 by means of a supply shift alone implies a reduction of the excess demand gap E_1E_3. Such a reduction can only come about through a reduction of enrollment demand or through a reduction of standards. In the real world, the latter may not

come. Hence, whether we work from the side of the institution or the side of the student, a subsidy to one may require a subsidy to the other.[8]

Other Implications of Price Control

What I have dubbed the "principle of joint subsidy" is actually a reflection of a phenomenon which is very familiar to economists. Any time prices are not allowed to move freely there is likely to occur a failure of markets to allocate resources in conformity to the wishes of people in the market. In the present instance, prices are usually set below the equilibrium or market clearing level. A wedge is driven between demand and supply. Variations in demand, by themselves, do not induce institutions to offer more educational services. Because of

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[8]Joint subsidization is probably too weak a phenomenon to be a true principle. Nevertheless, public authorities seem to recognize its existence. For example, student scholarships provided by the National Defense Education Act have been coupled with subsidies to the institutions in which the scholarship recipients are enrolled. One interesting by-product of this program may well be a more rapid evolution of nonprice rationing in participating institutions. The presence of NDEA scholarship students may cause these schools to acquire a taste for better students and to translate these newly acquired tastes into improved standards for all students.

this, institutions themselves are not moved to increase their demands for educational "factors of production," and society finds itself, in a sense, underinvesting in education. Society attempts to correct this underinvestment by resorting to a system of subsidies both to public and to private institutions. It is almost unnecessary to add that the final solution need bear no resemblance to the solution provided by free markets.

It is also of interest to contrast the consequences of price control in the field of education with the consequences of similar controls in the business world. During World War II, and again during the Korean War, prices were frozen below their equilibrium levels by the government in order to prevent the excess demands generated by military expenditures from expressing themselves in the form of open inflation. These controls also had the virtue of redirecting some of the flow of resources away from civilian production into military production. All sorts of evasions of these controls were tried, but from our point of view one of the most interesting consequences of the system was an attempt by businessmen to respond to the state of excess demand

by selling lower quality products. This response to price control is almost precisely the opposite to the response we have postulated for higher education. We have argued that institutions of higher education respond to excess demand with an improvement, not a deterioration, of standards. How to explain the difference?

First, it is important to note that universities and colleges sell enrollments, not products; and, to some extent, enrollments and products are not logically the same thing. An enrollment is a place to fill. From the standpoint of the student, to be sure, the place may be a good one or a bad one, just as a product may be a good one or a bad one. But, from the standpoint of the institution, a place may be a thing to fill with a good or bad student, and it is from this perspective that we have been speaking of nonprice response of higher education to price control and excess demand.

It is this difference in perspective which explains the contrasting responses of business and educational institutions to price control. Since businessmen strive for profits, they must tailor their product to meet the state of market demand. Educational institutions, on the other hand, strive to maximize institutional utilities.

As a result, the consumer must tailor his behavior to meet the demands of the institution. Price control gives the businessman the opportunity to reduce the quality of his service to the consumer. Price control gives the IHE the opportunity to demand a higher quality of performance from the consumer.

Concluding Comments

Institutions of higher education administer resources which, in today's world, are crucial to the process of economic development. To my knowledge, there does not exist a theory which discusses the manner in which these institutions administer these highly specialized resources. I regard this study as an initial probe into the area. As such, it is narrowly focused upon the behavior of the individual institution. The behavior of the whole industry must await further analysis; but, before such an analysis is attempted we must get straight the behavior of individual institutions.

Whether or not I have started out on the right path is hard to say. I am acutely aware of at least one problem in my approach. I have assumed a single utility function for the institution. Those familiar with the

administration of colleges and universities know well that they are often characterized by a variety of utility functions. Clark Kerr's "multiversity" fits many cases better than the ancient term "university." Yet basic decisions must be made by someone. The administrator is more than a mere mediator of contending factions. He decides as well as mediates. In doing so, must he not inevitably be imprinting his philosophy upon the institution?[9] If so, we may be permitted to speak of a single utility function for the institution. If not, then we must modify the conception of the educational firm presented in this paper.

But, whatever approach finally proves to be most useful, the problem should be attacked. Indeed, there are many areas outside of higher education in which similar theoretical work is sorely needed. A very large proportion of our resources are today administered by institutions other than the business firm. Some of

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[9]Kerr does see the university president as more than a mediator. Indeed, he calls the president a "mediator-initiator." See Uses of a University (Cambridge; Harvard University Press, 1964), especially pp. 29-41.

these institutions are public and some are private. They operate under a variety of constraints and with a variety of goals. The principles by which these various organizations allocate their resources and the ways in which they affect resource allocation in general are as important an area for economic research as the institutions of the private business sector.